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/*

* hash.c: chained hash tables

*

* Reference: Your favorite introductory book on algorithms

*

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* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-
20120111/include/acpiosxf.h

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% {

/******

*

* Module Name: dtparser.l - Flex input file for table compiler lexer

*

*****/

/******

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*

*****/

```

#include "aslcompiler.h"
#include "dtparser.y.h"

#define YY_NO_INPUT /* No file input, we use strings only */

#define _COMPONENT      ACPI_COMPILER
        ACPI_MODULE_NAME  ("dtscanner")
% }

%option noyywrap
%option nounput

Number      [0-9a-fA-F]+
HexNumber   0[xX][0-9a-fA-F]+
DecimalNumber 0[dD][0-9]+
LabelRef    ${a-zA-Z}[0-9a-zA-Z]*
WhiteSpace  [ \t\v\r]+
NewLine     [\n]

%%

\<      return (EXPOP_PAREN_OPEN);
\)      return (EXPOP_PAREN_CLOSE);
\~      return (EXPOP_ONES_COMPLIMENT);
\!      return (EXPOP_LOGICAL_NOT);
\*      return (EXPOP_MULTIPLY);
\/      return (EXPOP_DIVIDE);
\%      return (EXPOP_MODULO);
\+      return (EXPOP_ADD);
\-      return (EXPOP_SUBTRACT);
">>"   return (EXPOP_SHIFT_RIGHT);
"<<"   return (EXPOP_SHIFT_LEFT);
\<      return (EXPOP_LESS);
\>      return (EXPOP_GREATER);
"<="   return (EXPOP_LESS_EQUAL);
">="   return (EXPOP_GREATER_EQUAL);
"=="   return (EXPOP_EQUAL);
"!="   return (EXPOP_NOT_EQUAL);
\&      return (EXPOP_AND);
\^      return (EXPOP_XOR);
\|      return (EXPOP_OR);
"&&"   return (EXPOP_LOGICAL_AND);
"||"   return (EXPOP_LOGICAL_OR);
<<EOF>> return (EXPOP_EOF); /* null end-of-string */

{LabelRef} return (EXPOP_LABEL);
{Number}  return (EXPOP_NUMBER);

```

```

{HexNumber}    return (EXPOP_HEX_NUMBER);
{NewLine}     return (EXPOP_NEW_LINE);
{WhiteSpace}  /* Ignore */

        return (EXPOP_EOF);

%%

/*
 * Local support functions
 */
YY_BUFFER_STATE    LexBuffer;

/*****
 *
 * FUNCTION:  DtInitLexer, DtTerminateLexer
 *
 * PARAMETERS: String          - Input string to be parsed
 *
 * RETURN:    None
 *
 * DESCRIPTION: Initialization and termination routines for lexer. Lexer needs
 *              a buffer to handle strings instead of a file.
 *****/

int
DtInitLexer (
    char          *String)
{

    LexBuffer = yy_scan_string (String);
    return (LexBuffer == NULL);
}

void
DtTerminateLexer (
    void)
{

    yy_delete_buffer (LexBuffer);
}

```

Found in path(s):

```

* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/compiler/dtparser.l

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- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/executer/exconfig.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/executer/excreate.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/executer/exoparg6.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/executer/exoparg3.c

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% {

*****/

*

* Module Name: aslcompiler.y - Bison/Yacc input file (ASL grammar and actions)

*

*****/

*****/

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*****/

#include "aslcompiler.h"

```

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include "acpi.h"
#include "accommon.h"

#define _COMPONENT      ACPI_COMPILER
        ACPI_MODULE_NAME  ("aslparsed")

/*
 * Global Notes:
 *
 * October 2005: The following list terms have been optimized (from the
 * original ASL grammar in the ACPI specification) to force the immediate
 * reduction of each list item so that the parse stack use doesn't increase on
 * each list element and possibly overflow on very large lists (>4000 items).
 * This dramatically reduces use of the parse stack overall.
 *
 * ArgList, TermList, Objectlist, ByteList, DWordList, PackageList,
 * ResourceMacroList, and FieldUnitList
 */

void *      AslLocalAllocate (unsigned int Size);

/* Bison/yacc configuration */

#define static
#undef alloca
#define alloca      AslLocalAllocate
#define yyname      AslCompilername

#define YYINITDEPTH      600      /* State stack depth */
#define YYDEBUG          1        /* Enable debug output */
#define YYERROR_VERBOSE  1        /* Verbose error messages */

/*
 * The windows version of bison defines this incorrectly as "32768" (Not negative).
 * We use a custom (edited binary) version of bison that defines YYFLAG as YYFBAD
 * instead (#define YYFBAD 32768), so we can define it correctly here.
 *
 * The problem is that if YYFLAG is positive, the extended syntax error messages
 * are disabled.
 */
#define YYFLAG          -32768

% }

/*

```

```

* Declare the type of values in the grammar
*/
%union {
    UINT64      i;
    char        *s;
    ACPI_PARSE_OBJECT *n;
}

/*! [Begin] no source code translation */

/*
* These shift/reduce conflicts are expected. There should be zero
* reduce/reduce conflicts.
*/
%expect 86

/*****
*
* Token types: These are returned by the lexer
*
* NOTE: This list MUST match the AslKeywordMapping table found
*       in aslmap.c EXACTLY! Double check any changes!
*
*****/

%token <i> PARSEOP_ACCESSAS
%token <i> PARSEOP_ACCESSATTRIB_BLOCK
%token <i> PARSEOP_ACCESSATTRIB_BLOCK_CALL
%token <i> PARSEOP_ACCESSATTRIB_BYTE
%token <i> PARSEOP_ACCESSATTRIB_MULTIBYTE
%token <i> PARSEOP_ACCESSATTRIB_QUICK
%token <i> PARSEOP_ACCESSATTRIB_RAW_BYTES
%token <i> PARSEOP_ACCESSATTRIB_RAW_PROCESS
%token <i> PARSEOP_ACCESSATTRIB_SND_RCV
%token <i> PARSEOP_ACCESSATTRIB_WORD
%token <i> PARSEOP_ACCESSATTRIB_WORD_CALL
%token <i> PARSEOP_ACCESSTYPE_ANY
%token <i> PARSEOP_ACCESSTYPE_BUF
%token <i> PARSEOP_ACCESSTYPE_BYTE
%token <i> PARSEOP_ACCESSTYPE_DWORD
%token <i> PARSEOP_ACCESSTYPE_QWORD
%token <i> PARSEOP_ACCESSTYPE_WORD
%token <i> PARSEOP_ACQUIRE
%token <i> PARSEOP_ADD
%token <i> PARSEOP_ADDRESSINGMODE_7BIT
%token <i> PARSEOP_ADDRESSINGMODE_10BIT
%token <i> PARSEOP_ADDRESSTYPE ACPI
%token <i> PARSEOP_ADDRESSTYPE MEMORY

```

%token <i> PARSEOP_ADDRESSTYPE_NV
%token <i> PARSEOP_ADDRESSTYPE_RESERVED
%token <i> PARSEOP_ALIAS
%token <i> PARSEOP_AND
%token <i> PARSEOP_ARG0
%token <i> PARSEOP_ARG1
%token <i> PARSEOP_ARG2
%token <i> PARSEOP_ARG3
%token <i> PARSEOP_ARG4
%token <i> PARSEOP_ARG5
%token <i> PARSEOP_ARG6
%token <i> PARSEOP_BANKFIELD
%token <i> PARSEOP_BITSPERBYTE_EIGHT
%token <i> PARSEOP_BITSPERBYTE_FIVE
%token <i> PARSEOP_BITSPERBYTE_NINE
%token <i> PARSEOP_BITSPERBYTE_SEVEN
%token <i> PARSEOP_BITSPERBYTE_SIX
%token <i> PARSEOP_BREAK
%token <i> PARSEOP_BREAKPOINT
%token <i> PARSEOP_BUFFER
%token <i> PARSEOP_BUSMASTERTYPE_MASTER
%token <i> PARSEOP_BUSMASTERTYPE_NOTMASTER
%token <i> PARSEOP_BYTECONST
%token <i> PARSEOP_CASE
%token <i> PARSEOP_CLOCKPHASE_FIRST
%token <i> PARSEOP_CLOCKPHASE_SECOND
%token <i> PARSEOP_CLOCKPOLARITY_HIGH
%token <i> PARSEOP_CLOCKPOLARITY_LOW
%token <i> PARSEOP_CONCATENATE
%token <i> PARSEOP_CONCATENATERESTEMPLATE
%token <i> PARSEOP_CONDREFOF
%token <i> PARSEOP_CONNECTION
%token <i> PARSEOP_CONTINUE
%token <i> PARSEOP_COPYOBJECT
%token <i> PARSEOP_CREATEBITFIELD
%token <i> PARSEOP_CREATEBYTEFIELD
%token <i> PARSEOP_CREATEDWORDFIELD
%token <i> PARSEOP_CREATEFIELD
%token <i> PARSEOP_CREATEQWORDFIELD
%token <i> PARSEOP_CREATEWORDFIELD
%token <i> PARSEOP_DATABUFFER
%token <i> PARSEOP_DATATABLEREGION
%token <i> PARSEOP_DEBUG
%token <i> PARSEOP_DECODETYPE_POS
%token <i> PARSEOP_DECODETYPE_SUB
%token <i> PARSEOP_DECREMENT
%token <i> PARSEOP_DEFAULT
%token <i> PARSEOP_DEFAULT_ARG

%token <i> PARSEOP_DEFINITIONBLOCK
%token <i> PARSEOP_DEREFOP
%token <i> PARSEOP_DEVICE
%token <i> PARSEOP_DEVICEPOLARITY_HIGH
%token <i> PARSEOP_DEVICEPOLARITY_LOW
%token <i> PARSEOP_DIVIDE
%token <i> PARSEOP_DMA
%token <i> PARSEOP_DMATYPE_A
%token <i> PARSEOP_DMATYPE_COMPATIBILITY
%token <i> PARSEOP_DMATYPE_B
%token <i> PARSEOP_DMATYPE_F
%token <i> PARSEOP_DWORDCONST
%token <i> PARSEOP_DWORDIO
%token <i> PARSEOP_DWORDMEMORY
%token <i> PARSEOP_DWORDSPACE
%token <i> PARSEOP_EISAID
%token <i> PARSEOP_ELSE
%token <i> PARSEOP_ELSEIF
%token <i> PARSEOP_ENDDEPENDENTFN
%token <i> PARSEOP_ENDIAN_BIG
%token <i> PARSEOP_ENDIAN_LITTLE
%token <i> PARSEOP_ENDTAG
%token <i> PARSEOP_ERRORNODE
%token <i> PARSEOP_EVENT
%token <i> PARSEOP_EXTENDEDIO
%token <i> PARSEOP_EXTENDEDMEMORY
%token <i> PARSEOP_EXTENDEDSPACE
%token <i> PARSEOP_EXTERNAL
%token <i> PARSEOP_FATAL
%token <i> PARSEOP_FIELD
%token <i> PARSEOP_FINDSETLEFTBIT
%token <i> PARSEOP_FINDSETRIGHTBIT
%token <i> PARSEOP_FIXEDDMA
%token <i> PARSEOP_FIXEDIO
%token <i> PARSEOP_FLOWCONTROL_HW
%token <i> PARSEOP_FLOWCONTROL_NONE
%token <i> PARSEOP_FLOWCONTROL_SW
%token <i> PARSEOP_FROMBCD
%token <i> PARSEOP_FUNCTION
%token <i> PARSEOP_GPIO_INT
%token <i> PARSEOP_GPIO_IO
%token <i> PARSEOP_I2C_SERIALBUS
%token <i> PARSEOP_IF
%token <i> PARSEOP_INCLUDE
%token <i> PARSEOP_INCLUDE_CSTYLE
%token <i> PARSEOP_INCLUDE_END
%token <i> PARSEOP_INCREMENT
%token <i> PARSEOP_INDEX

%token <i> PARSEOP_INDEXFIELD
%token <i> PARSEOP_INTEGER
%token <i> PARSEOP_INTERRUPT
%token <i> PARSEOP_INTLEVEL_ACTIVEBOTH
%token <i> PARSEOP_INTLEVEL_ACTIVEHIGH
%token <i> PARSEOP_INTLEVEL_ACTIVELOW
%token <i> PARSEOP_INTTYPE_EDGE
%token <i> PARSEOP_INTTYPE_LEVEL
%token <i> PARSEOP_IO
%token <i> PARSEOP_IODECODETYPE_10
%token <i> PARSEOP_IODECODETYPE_16
%token <i> PARSEOP_IORESTRICT_IN
%token <i> PARSEOP_IORESTRICT_NONE
%token <i> PARSEOP_IORESTRICT_OUT
%token <i> PARSEOP_IORESTRICT_PRESERVE
%token <i> PARSEOP_IRQ
%token <i> PARSEOP_IRQNOFLAGS
%token <i> PARSEOP_LAND
%token <i> PARSEOP_LEQUAL
%token <i> PARSEOP_LGREATER
%token <i> PARSEOP_LGREATEREQUAL
%token <i> PARSEOP_LINE_CSTYLE
%token <i> PARSEOP_LLESS
%token <i> PARSEOP_LLESSEQUAL
%token <i> PARSEOP_LNOT
%token <i> PARSEOP_LNOTEQUAL
%token <i> PARSEOP_LOAD
%token <i> PARSEOP_LOADTABLE
%token <i> PARSEOP_LOCAL0
%token <i> PARSEOP_LOCAL1
%token <i> PARSEOP_LOCAL2
%token <i> PARSEOP_LOCAL3
%token <i> PARSEOP_LOCAL4
%token <i> PARSEOP_LOCAL5
%token <i> PARSEOP_LOCAL6
%token <i> PARSEOP_LOCAL7
%token <i> PARSEOP_LOCKRULE_LOCK
%token <i> PARSEOP_LOCKRULE_NOLOCK
%token <i> PARSEOP_LOR
%token <i> PARSEOP_MATCH
%token <i> PARSEOP_MATCHTYPE_MEQ
%token <i> PARSEOP_MATCHTYPE_MGE
%token <i> PARSEOP_MATCHTYPE_MGT
%token <i> PARSEOP_MATCHTYPE_MLE
%token <i> PARSEOP_MATCHTYPE_MLT
%token <i> PARSEOP_MATCHTYPE_MTR
%token <i> PARSEOP_MAXTYPE_FIXED
%token <i> PARSEOP_MAXTYPE_NOTFIXED

%token <i> PARSEOP_MEMORY24
%token <i> PARSEOP_MEMORY32
%token <i> PARSEOP_MEMORY32FIXED
%token <i> PARSEOP_MEMTYPE_CACHEABLE
%token <i> PARSEOP_MEMTYPE_NONCACHEABLE
%token <i> PARSEOP_MEMTYPE_PREFETCHABLE
%token <i> PARSEOP_MEMTYPE_WRITECOMBINING
%token <i> PARSEOP_METHOD
%token <i> PARSEOP_METHODCALL
%token <i> PARSEOP_MID
%token <i> PARSEOP_MINTYPE_FIXED
%token <i> PARSEOP_MINTYPE_NOTFIXED
%token <i> PARSEOP_MOD
%token <i> PARSEOP_MULTIPLY
%token <i> PARSEOP_MUTEX
%token <i> PARSEOP_NAME
%token <s> PARSEOP_NAMESEG
%token <s> PARSEOP_NAMESTRING
%token <i> PARSEOP_NAND
%token <i> PARSEOP_NOOP
%token <i> PARSEOP_NOR
%token <i> PARSEOP_NOT
%token <i> PARSEOP_NOTIFY
%token <i> PARSEOP_OBJECTTYPE
%token <i> PARSEOP_OBJECTTYPE_BFF
%token <i> PARSEOP_OBJECTTYPE_BUF
%token <i> PARSEOP_OBJECTTYPE_DDB
%token <i> PARSEOP_OBJECTTYPE_DEV
%token <i> PARSEOP_OBJECTTYPE_EVT
%token <i> PARSEOP_OBJECTTYPE_FLD
%token <i> PARSEOP_OBJECTTYPE_INT
%token <i> PARSEOP_OBJECTTYPE_MTH
%token <i> PARSEOP_OBJECTTYPE_MTX
%token <i> PARSEOP_OBJECTTYPE_OPR
%token <i> PARSEOP_OBJECTTYPE_PKG
%token <i> PARSEOP_OBJECTTYPE_POW
%token <i> PARSEOP_OBJECTTYPE_PRO
%token <i> PARSEOP_OBJECTTYPE_STR
%token <i> PARSEOP_OBJECTTYPE_THZ
%token <i> PARSEOP_OBJECTTYPE_UNK
%token <i> PARSEOP_OFFSET
%token <i> PARSEOP_ONE
%token <i> PARSEOP_ONES
%token <i> PARSEOP_OPERATIONREGION
%token <i> PARSEOP_OR
%token <i> PARSEOP_PACKAGE
%token <i> PARSEOP_PACKAGE_LENGTH
%token <i> PARSEOP_PARITYTYPE_EVEN

%token <i> PARSEOP_PARITYTYPE_MARK
%token <i> PARSEOP_PARITYTYPE_NONE
%token <i> PARSEOP_PARITYTYPE_ODD
%token <i> PARSEOP_PARITYTYPE_SPACE
%token <i> PARSEOP_PIN_NOPULL
%token <i> PARSEOP_PIN_PULLDEFAULT
%token <i> PARSEOP_PIN_PULLDOWN
%token <i> PARSEOP_PIN_PULLUP
%token <i> PARSEOP_POWERRESOURCE
%token <i> PARSEOP_PROCESSOR
%token <i> PARSEOP_QWORDCONST
%token <i> PARSEOP_QWORDIO
%token <i> PARSEOP_QWORDMEMORY
%token <i> PARSEOP_QWORDSPACE
%token <i> PARSEOP_RANGETYPE_ENTIRE
%token <i> PARSEOP_RANGETYPE_ISAONLY
%token <i> PARSEOP_RANGETYPE_NONISAONLY
%token <i> PARSEOP_RAW_DATA
%token <i> PARSEOP_READWRITETYPE_BOTH
%token <i> PARSEOP_READWRITETYPE_READONLY
%token <i> PARSEOP_REFOF
%token <i> PARSEOP_REGIONSPACE_CMOS
%token <i> PARSEOP_REGIONSPACE_EC
%token <i> PARSEOP_REGIONSPACE_FIXEDHW
%token <i> PARSEOP_REGIONSPACE_GPIO
%token <i> PARSEOP_REGIONSPACE_GSBUS
%token <i> PARSEOP_REGIONSPACE_IO
%token <i> PARSEOP_REGIONSPACE_IPMI
%token <i> PARSEOP_REGIONSPACE_MEM
%token <i> PARSEOP_REGIONSPACE_PCI
%token <i> PARSEOP_REGIONSPACE_PCIBAR
%token <i> PARSEOP_REGIONSPACE_SMBUS
%token <i> PARSEOP_REGISTER
%token <i> PARSEOP_RELEASE
%token <i> PARSEOP_RESERVED_BYTES
%token <i> PARSEOP_RESET
%token <i> PARSEOP_RESOURCETEMPLATE
%token <i> PARSEOP_RESOURCETYPE_CONSUMER
%token <i> PARSEOP_RESOURCETYPE_PRODUCER
%token <i> PARSEOP_RETURN
%token <i> PARSEOP_REVISION
%token <i> PARSEOP_SCOPE
%token <i> PARSEOP_SERIALIZERULE_NOTSERIAL
%token <i> PARSEOP_SERIALIZERULE_SERIAL
%token <i> PARSEOP_SHARETYPE_EXCLUSIVE
%token <i> PARSEOP_SHARETYPE_EXCLUSIVEWAKE
%token <i> PARSEOP_SHARETYPE_SHARED
%token <i> PARSEOP_SHARETYPE_SHAREDWAKE

%token <i> PARSEOP_SHIFLEFT
%token <i> PARSEOP_SHIFTRIGHT
%token <i> PARSEOP_SIGNAL
%token <i> PARSEOP_SIZEOF
%token <i> PARSEOP_SLAVEMODE_CONTROLLERINIT
%token <i> PARSEOP_SLAVEMODE_DEVICEINIT
%token <i> PARSEOP_SLEEP
%token <i> PARSEOP_SPI_SERIALBUS
%token <i> PARSEOP_STALL
%token <i> PARSEOP_STARTDEPENDENTFN
%token <i> PARSEOP_STARTDEPENDENTFN_NOPRI
%token <i> PARSEOP_STOPBITS_ONE
%token <i> PARSEOP_STOPBITS_ONEPLUSHALF
%token <i> PARSEOP_STOPBITS_TWO
%token <i> PARSEOP_STOPBITS_ZERO
%token <i> PARSEOP_STORE
%token <s> PARSEOP_STRING_LITERAL
%token <i> PARSEOP_SUBTRACT
%token <i> PARSEOP_SWITCH
%token <i> PARSEOP_THERMALZONE
%token <i> PARSEOP_TIMER
%token <i> PARSEOP_TOBCD
%token <i> PARSEOP_TOBUFFER
%token <i> PARSEOP_TODECIMALSTRING
%token <i> PARSEOP_TOHEXSTRING
%token <i> PARSEOP_TOINTEGER
%token <i> PARSEOP_TOSTRING
%token <i> PARSEOP_TOUUID
%token <i> PARSEOP_TRANSLATIONTYPE_DENSE
%token <i> PARSEOP_TRANSLATIONTYPE_SPARSE
%token <i> PARSEOP_TYPE_STATIC
%token <i> PARSEOP_TYPE_TRANSLATION
%token <i> PARSEOP_UART_SERIALBUS
%token <i> PARSEOP_UNICODE
%token <i> PARSEOP_UNLOAD
%token <i> PARSEOP_UPDATERULE_ONES
%token <i> PARSEOP_UPDATERULE_PRESERVE
%token <i> PARSEOP_UPDATERULE_ZEROS
%token <i> PARSEOP_VAR_PACKAGE
%token <i> PARSEOP_VENDORLONG
%token <i> PARSEOP_VENDORSHORT
%token <i> PARSEOP_WAIT
%token <i> PARSEOP_WHILE
%token <i> PARSEOP_WIREMODE_FOUR
%token <i> PARSEOP_WIREMODE_THREE
%token <i> PARSEOP_WORDBUSNUMBER
%token <i> PARSEOP_WORDCONST
%token <i> PARSEOP_WORDIO

```
%token <i> PARSEOP_WORDSAPCE
%token <i> PARSEOP_XFERSIZE_8
%token <i> PARSEOP_XFERSIZE_16
%token <i> PARSEOP_XFERSIZE_32
%token <i> PARSEOP_XFERSIZE_64
%token <i> PARSEOP_XFERSIZE_128
%token <i> PARSEOP_XFERSIZE_256
%token <i> PARSEOP_XFERTYPE_8
%token <i> PARSEOP_XFERTYPE_8_16
%token <i> PARSEOP_XFERTYPE_16
%token <i> PARSEOP_XOR
%token <i> PARSEOP_ZERO
```

```
/*
 * Special functions. These should probably stay at the end of this
 * table.
 */
```

```
%token <i> PARSEOP__DATE__
%token <i> PARSEOP__FILE__
%token <i> PARSEOP__LINE__
%token <i> PARSEOP__PATH__
```

```
/******
 *
 * Production names
 *
 *****/
```

```
%type <n> ArgList
%type <n> ASLCode
%type <n> BufferData
%type <n> BufferTermData
%type <n> CompilerDirective
%type <n> DataObject
%type <n> DefinitionBlockTerm
%type <n> IntegerData
%type <n> NamedObject
%type <n> NameSpaceModifier
%type <n> Object
%type <n> ObjectList
%type <n> PackageData
%type <n> ParameterTypePackage
%type <n> ParameterTypePackageList
%type <n> ParameterTypesPackage
%type <n> ParameterTypesPackageList
%type <n> RequiredTarget
%type <n> SimpleTarget
```

```

%type <n> StringData
%type <n> Target
%type <n> Term
%type <n> TermArg
%type <n> TermList
%type <n> UserTerm

/* Type4Opcode is obsolete */

%type <n> Type1Opcode
%type <n> Type2BufferOpcode
%type <n> Type2BufferOrStringOpcode
%type <n> Type2IntegerOpcode
%type <n> Type2Opcode
%type <n> Type2StringOpcode
%type <n> Type3Opcode
%type <n> Type5Opcode
%type <n> Type6Opcode

%type <n> AccessAsTerm
%type <n> ExternalTerm
%type <n> FieldUnit
%type <n> FieldUnitEntry
%type <n> FieldUnitList
%type <n> IncludeCStyleTerm
%type <n> IncludeTerm
%type <n> LineTerm
%type <n> OffsetTerm
%type <n> OptionalAccessAttribTerm

/* Named Objects */

%type <n> BankFieldTerm
%type <n> CreateBitFieldTerm
%type <n> CreateByteFieldTerm
%type <n> CreateDWordFieldTerm
%type <n> CreateFieldTerm
%type <n> CreateQWordFieldTerm
%type <n> CreateWordFieldTerm
%type <n> DataRegionTerm
%type <n> DeviceTerm
%type <n> EventTerm
%type <n> FieldTerm
%type <n> FunctionTerm
%type <n> IndexFieldTerm
%type <n> MethodTerm
%type <n> MutexTerm
%type <n> OpRegionTerm

```

```
%type <n> OpRegionSpaceIdTerm
%type <n> PowerResTerm
%type <n> ProcessorTerm
%type <n> ThermalZoneTerm
```

```
/* Namespace modifiers */
```

```
%type <n> AliasTerm
%type <n> NameTerm
%type <n> ScopeTerm
```

```
/* Type 1 opcodes */
```

```
%type <n> BreakPointTerm
%type <n> BreakTerm
%type <n> CaseDefaultTermList
%type <n> CaseTerm
%type <n> ContinueTerm
%type <n> DefaultTerm
%type <n> ElseTerm
%type <n> FatalTerm
%type <n> IfElseTerm
%type <n> IfTerm
%type <n> LoadTerm
%type <n> NoOpTerm
%type <n> NotifyTerm
%type <n> ReleaseTerm
%type <n> ResetTerm
%type <n> ReturnTerm
%type <n> SignalTerm
%type <n> SleepTerm
%type <n> StallTerm
%type <n> SwitchTerm
%type <n> UnloadTerm
%type <n> WhileTerm
//%type <n> CaseTermList
```

```
/* Type 2 opcodes */
```

```
%type <n> AcquireTerm
%type <n> AddTerm
%type <n> AndTerm
%type <n> ConcatResTerm
%type <n> ConcatTerm
%type <n> CondRefOfTerm
%type <n> CopyObjectTerm
%type <n> DecTerm
%type <n> DerefOfTerm
```

%type <n> DivideTerm
%type <n> FindSetLeftBitTerm
%type <n> FindSetRightBitTerm
%type <n> FromBCDTerm
%type <n> IncTerm
%type <n> IndexTerm
%type <n> LAndTerm
%type <n> LEqualTerm
%type <n> LGreaterEqualTerm
%type <n> LGreaterTerm
%type <n> LLessEqualTerm
%type <n> LLessTerm
%type <n> LNotEqualTerm
%type <n> LNotTerm
%type <n> LoadTableTerm
%type <n> LOrTerm
%type <n> MatchTerm
%type <n> MidTerm
%type <n> ModTerm
%type <n> MultiplyTerm
%type <n> NAndTerm
%type <n> NOrTerm
%type <n> NotTerm
%type <n> ObjectTypeTerm
%type <n> OrTerm
%type <n> RefOfTerm
%type <n> ShiftLeftTerm
%type <n> ShiftRightTerm
%type <n> SizeOfTerm
%type <n> StoreTerm
%type <n> SubtractTerm
%type <n> TimerTerm
%type <n> ToBCDTerm
%type <n> ToBufferTerm
%type <n> ToDecimalStringTerm
%type <n> ToHexStringTerm
%type <n> ToIntegerTerm
%type <n> ToStringTerm
%type <n> WaitTerm
%type <n> XOrTerm

/* Keywords */

%type <n> AccessAttribKeyword
%type <n> AccessTypeKeyword
%type <n> AddressingModeKeyword
%type <n> AddressKeyword
%type <n> AddressSpaceKeyword


```
%type <n> BitsPerByteKeyword
%type <n> ClockPhaseKeyword
%type <n> ClockPolarityKeyword
%type <n> DecodeKeyword
%type <n> DevicePolarityKeyword
%type <n> DMATypeKeyword
%type <n> EndianKeyword
%type <n> FlowControlKeyword
%type <n> InterruptLevel
%type <n> InterruptTypeKeyword
%type <n> IODecodeKeyword
%type <n> IoRestrictionKeyword
%type <n> LockRuleKeyword
%type <n> MatchOpKeyword
%type <n> MaxKeyword
%type <n> MemTypeKeyword
%type <n> MinKeyword
%type <n> ObjectTypeKeyword
%type <n> OptionalBusMasterKeyword
%type <n> OptionalReadWriteKeyword
%type <n> ParityTypeKeyword
%type <n> PinConfigByte
%type <n> PinConfigKeyword
%type <n> RangeTypeKeyword
%type <n> RegionSpaceKeyword
%type <n> ResourceTypeKeyword
%type <n> SerializeRuleKeyword
%type <n> ShareTypeKeyword
%type <n> SlaveModeKeyword
%type <n> StopBitsKeyword
%type <n> TranslationKeyword
%type <n> TypeKeyword
%type <n> UpdateRuleKeyword
%type <n> WireModeKeyword
%type <n> XferSizeKeyword
%type <n> XferTypeKeyword
```

```
/* Types */
```

```
%type <n> SuperName
%type <n> ArgTerm
%type <n> LocalTerm
%type <n> DebugTerm
```

```
%type <n> Integer
%type <n> ByteConst
%type <n> WordConst
%type <n> DWordConst
```

%type <n> QWordConst

%type <n> String

%type <n> ConstTerm

%type <n> ConstExprTerm

%type <n> ByteConstExpr

%type <n> WordConstExpr

%type <n> DWordConstExpr

%type <n> QWordConstExpr

%type <n> DWordList

%type <n> BufferTerm

%type <n> ByteList

%type <n> PackageElement

%type <n> PackageList

%type <n> PackageTerm

%type <n> VarPackageLengthTerm

/* Macros */

%type <n> EISAIDTerm

%type <n> ResourceMacroList

%type <n> ResourceMacroTerm

%type <n> ResourceTemplateTerm

%type <n> ToUUIDTerm

%type <n> UnicodeTerm

/* Resource Descriptors */

%type <n> ConnectionTerm

%type <n> DataBufferTerm

%type <n> DMATerm

%type <n> DWordIOTerm

%type <n> DWordMemoryTerm

%type <n> DWordSpaceTerm

%type <n> EndDependentFnTerm

%type <n> ExtendedIOTerm

%type <n> ExtendedMemoryTerm

%type <n> ExtendedSpaceTerm

%type <n> FixedDmaTerm

%type <n> FixedIOTerm

%type <n> GpioIntTerm

%type <n> GpioIoTerm

%type <n> I2cSerialBusTerm

%type <n> InterruptTerm

%type <n> IOTerm

%type <n> IRQNoFlagsTerm

```
%type <n> IRQTerm
%type <n> Memory24Term
%type <n> Memory32FixedTerm
%type <n> Memory32Term
%type <n> NameSeg
%type <n> NameString
%type <n> QWordIOTerm
%type <n> QWordMemoryTerm
%type <n> QWordSpaceTerm
%type <n> RegisterTerm
%type <n> SpiSerialBusTerm
%type <n> StartDependentFnNoPriTerm
%type <n> StartDependentFnTerm
%type <n> UartSerialBusTerm
%type <n> VendorLongTerm
%type <n> VendorShortTerm
%type <n> WordBusNumberTerm
%type <n> WordIOTerm
%type <n> WordSpaceTerm
```

```
/* Local types that help construct the AML, not in ACPI spec */
```

```
%type <n> AmlPackageLengthTerm
%type <n> IncludeEndTerm
%type <n> NameStringItem
%type <n> TermArgItem
```

```
%type <n> OptionalAccessSize
%type <n> OptionalAddressingMode
%type <n> OptionalAddressRange
%type <n> OptionalBitsPerByte
%type <n> OptionalBuffer_Last
%type <n> OptionalByteConstExpr
%type <n> OptionalCount
%type <n> OptionalDecodeType
%type <n> OptionalDevicePolarity
%type <n> OptionalDWordConstExpr
%type <n> OptionalEndian
%type <n> OptionalFlowControl
%type <n> OptionalIoRestriction
%type <n> OptionalListString
%type <n> OptionalMaxType
%type <n> OptionalMemType
%type <n> OptionalMinType
%type <n> OptionalNameString
%type <n> OptionalNameString_First
%type <n> OptionalNameString_Last
%type <n> OptionalObjectTypeKeyword
```

```

%type <n> OptionalParameterTypePackage
%type <n> OptionalParameterTypesPackage
%type <n> OptionalParityType
%type <n> OptionalQWordConstExpr
%type <n> OptionalRangeType
%type <n> OptionalReference
%type <n> OptionalResourceType
%type <n> OptionalResourceType_First
%type <n> OptionalReturnArg
%type <n> OptionalSerializeRuleKeyword
%type <n> OptionalShareType
%type <n> OptionalShareType_First
%type <n> OptionalSlaveMode
%type <n> OptionalStopBits
%type <n> OptionalStringData
%type <n> OptionalTermArg
%type <n> OptionalTranslationType_Last
%type <n> OptionalType
%type <n> OptionalType_Last
%type <n> OptionalWireMode
%type <n> OptionalWordConst
%type <n> OptionalWordConstExpr
%type <n> OptionalXferSize

%%
/*****
*
* Production rules start here
*
*****/

/*
* ASL Names
*/

/*
* Blocks, Data, and Opcodes
*/

ASLCode
: DefinitionBlockTerm
| error { YYABORT; $$ = NULL; }
;

/*
* Note concerning support for "module-level code".
*

```

* ACPI 1.0 allowed Type1 and Type2 executable opcodes outside of control methods (the so-called module-level code.) This support was explicitly removed in ACPI 2.0, but this type of code continues to be created by BIOS vendors. In order to support the disassembly and recompilation of such code (and the porting of ASL code to iASL), iASL supports this code in violation of the current ACPI specification.

*
 * The grammar change to support module-level code is to revert the {ObjectList} portion of the DefinitionBlockTerm in ACPI 2.0 to the original use of {TermList} instead (see below.) This allows the use of Type1 and Type2 opcodes at module level.

*/

DefinitionBlockTerm

```
: PARSEOP_DEFINITIONBLOCK '(' {<n>$ = TrCreateLeafNode (PARSEOP_DEFINITIONBLOCK);}
  String ','
  String ','
  ByteConst ','
  String ','
  String ','
  DWordConst
  ')'          {TrSetEndLineNumber (<n>3);}
  '{' TermList '}'    {$$ = TrLinkChildren (<n>3,7,$4,$6,$8,$10,$12,$14,$18);}
;
```

/* ACPI 3.0 -- allow semicolons between terms */

TermList

```
:          {$$ = NULL;}
| TermList Term          {$$ = TrLinkPeerNode (TrSetNodeFlags ($1, NODE_RESULT_NOT_USED),$2);}
| TermList Term ';'      {$$ = TrLinkPeerNode (TrSetNodeFlags ($1, NODE_RESULT_NOT_USED),$2);}
| TermList ';' Term      {$$ = TrLinkPeerNode (TrSetNodeFlags ($1, NODE_RESULT_NOT_USED),$3);}
| TermList ';' Term ';'  {$$ = TrLinkPeerNode (TrSetNodeFlags ($1, NODE_RESULT_NOT_USED),$3);}
;
```

Term

```
: Object          {}
| Type1Opcode      {}
| Type2Opcode      {}
| Type2IntegerOpcode  {}
| Type2StringOpcode  {}
| Type2BufferOpcode  {}
| Type2BufferOrStringOpcode  {}
| error            {$$ = AslDoError(); yyclearin;}
;
```

CompilerDirective

```
: IncludeTerm      {}
| IncludeCStyleTerm  {$$ = NULL;}
;
```

```

| LineTerm    {$$ = NULL;}
| ExternalTerm    {}
;

ObjectList
:            {$$ = NULL;}
| ObjectList Object    {$$ = TrLinkPeerNode ($1,$2);}
| error            {$$ = AslDoError(); yyclearin;}
;

Object
: CompilerDirective    {}
| NamedObject    {}
| NameSpaceModifier    {}
;

DataObject
: BufferData    {}
| PackageData    {}
| IntegerData    {}
| StringData    {}
;

BufferData
: Type5Opcode    {$$ = TrSetNodeFlags ($1, NODE_COMPILE_TIME_CONST);}
| Type2BufferOrStringOpcode    {$$ = TrSetNodeFlags ($1, NODE_COMPILE_TIME_CONST);}
| Type2BufferOpcode    {$$ = TrSetNodeFlags ($1, NODE_COMPILE_TIME_CONST);}
| BufferTerm    {}
;

PackageData
: PackageTerm    {}
;

IntegerData
: Type2IntegerOpcode    {$$ = TrSetNodeFlags ($1, NODE_COMPILE_TIME_CONST);}
| Type3Opcode    {$$ = TrSetNodeFlags ($1, NODE_COMPILE_TIME_CONST);}
| Integer    {}
| ConstTerm    {}
;

StringData
: Type2StringOpcode    {$$ = TrSetNodeFlags ($1, NODE_COMPILE_TIME_CONST);}
| String    {}
;

NamedObject
: BankFieldTerm    {}

```

```

| CreateBitFieldTerm      {}
| CreateByteFieldTerm    {}
| CreateDWordFieldTerm   {}
| CreateFieldTerm        {}
| CreateQWordFieldTerm   {}
| CreateWordFieldTerm    {}
| DataRegionTerm         {}
| DeviceTerm              {}
| EventTerm               {}
| FieldTerm               {}
| FunctionTerm            {}
| IndexFieldTerm         {}
| MethodTerm              {}
| MutexTerm               {}
| OpRegionTerm           {}
| PowerResTerm            {}
| ProcessorTerm           {}
| ThermalZoneTerm        {}
;

NamespaceModifier
: AliasTerm               {}
| NameTerm                 {}
| ScopeTerm                {}
;

UserTerm
: NameString '('          {TrUpdateNode (PARSEOP_METHODCALL, $1);}
  ArgList ')'             {$$ = TrLinkChildNode ($1,$4);}
;

ArgList
:                          {$$ = NULL;}
| TermArg
| ArgList ','             /* Allows a trailing comma at list end */
| ArgList ','
  TermArg                  {$$ = TrLinkPeerNode ($1,$3);}
;

/*
Removed from TermArg due to reduce/reduce conflicts
| Type2IntegerOpcode      {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| Type2StringOpcode       {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| Type2BufferOpcode       {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| Type2BufferOrStringOpcode {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}

*/

```

```

TermArg
: Type2Opcode          {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| DataObject           {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| NameString           {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| ArgTerm              {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
| LocalTerm            {$$ = TrSetNodeFlags ($1, NODE_IS_TERM_ARG);}
;

Target
:                      {$$ = TrSetNodeFlags (TrCreateLeafNode (PARSEOP_ZERO), NODE_IS_TARGET |
NODE_COMPILE_TIME_CONST);} /* Placeholder is a ZeroOp object */
| ','                  {$$ = TrSetNodeFlags (TrCreateLeafNode (PARSEOP_ZERO), NODE_IS_TARGET |
NODE_COMPILE_TIME_CONST);} /* Placeholder is a ZeroOp object */
| ',' SuperName        {$$ = TrSetNodeFlags ($2, NODE_IS_TARGET);}
;

RequiredTarget
: ',' SuperName        {$$ = TrSetNodeFlags ($2, NODE_IS_TARGET);}
;

SimpleTarget
: NameString           {}
| LocalTerm            {}
| ArgTerm              {}
;

/* Rules for specifying the type of one method argument or return value */

ParameterTypePackage
:                      {$$ = NULL;}
| ObjectTypeKeyword    {$$ = $1;}
| ParameterTypePackage ','
  ObjectTypeKeyword    {$$ = TrLinkPeerNodes (2,$1,$3);}
;

ParameterTypePackageList
:                      {$$ = NULL;}
| ObjectTypeKeyword    {$$ = $1;}
| '{' ParameterTypePackage '}' {$$ = $2;}
;

OptionalParameterTypePackage
:                      {$$ = TrCreateLeafNode (PARSEOP_DEFAULT_ARG);}
| ',' ParameterTypePackageList {$$ = TrLinkChildren (TrCreateLeafNode (PARSEOP_DEFAULT_ARG),1,$2);}
;

/* Rules for specifying the types for method arguments */

```


ParameterTypesPackage

```
: ParameterTypePackageList  {$$ = $1;}
| ParameterTypesPackage ','
  ParameterTypePackageList  {$$ = TrLinkPeerNodes (2,$1,$3);}
;
```

ParameterTypesPackageList

```
:                               {$$ = NULL;}
| ObjectTypeKeyword            {$$ = $1;}
| '{' ParameterTypesPackage '}' {$$ = $2;}
;
```

OptionalParameterTypesPackage

```
:                               {$$ = TrCreateLeafNode (PARSEOP_DEFAULT_ARG);}
| ',' ParameterTypesPackageList {$$ = TrLinkChildren (TrCreateLeafNode (PARSEOP_DEFAULT_ARG),1,$2);}
;
```

/* Opcode types */

Type1Opcode

```
: BreakTerm          {}
| BreakPointTerm     {}
| ContinueTerm       {}
| FatalTerm          {}
| IfElseTerm         {}
| LoadTerm           {}
| NoOpTerm           {}
| NotifyTerm         {}
| ReleaseTerm        {}
| ResetTerm          {}
| ReturnTerm         {}
| SignalTerm         {}
| SleepTerm          {}
| StallTerm          {}
| SwitchTerm         {}
| UnloadTerm         {}
| WhileTerm          {}
;
```

Type2Opcode

```
: AcquireTerm        {}
| CondRefOfTerm      {}
| CopyObjectTerm     {}
| DerefOfTerm        {}
| ObjectTypeTerm     {}
| RefOfTerm          {}
| SizeOfTerm         {}
```

```

| StoreTerm      {}
| TimerTerm     {}
| WaitTerm      {}
| UserTerm      {}
;

/*
* Type 3/4/5 opcodes
*/

Type2IntegerOpcode      /* "Type3" opcodes */
: AddTerm              {}
| AndTerm              {}
| DecTerm              {}
| DivideTerm          {}
| FindSetLeftBitTerm  {}
| FindSetRightBitTerm {}
| FromBCDTerm         {}
| IncTerm              {}
| IndexTerm           {}
| LAndTerm            {}
| LEqualTerm          {}
| LGreaterTerm        {}
| LGreaterEqualTerm  {}
| LLessTerm           {}
| LLessEqualTerm     {}
| LNotTerm            {}
| LNotEqualTerm       {}
| LoadTableTerm      {}
| LOrTerm             {}
| MatchTerm           {}
| ModTerm             {}
| MultiplyTerm        {}
| NAndTerm            {}
| NOrTerm             {}
| NotTerm             {}
| OrTerm              {}
| ShiftLeftTerm       {}
| ShiftRightTerm      {}
| SubtractTerm        {}
| ToBCDTerm           {}
| ToIntegerTerm       {}
| XOrTerm             {}
;

Type2StringOpcode      /* "Type4" Opcodes */
: ToDecimalStringTerm  {}
| ToHexStringTerm     {}

```

```

| ToStringTerm      {}
;

Type2BufferOpcode      /* "Type5" Opcodes */
: ToBufferTerm      {}
| ConcatResTerm      {}
;

Type2BufferOrStringOpcode
: ConcatTerm        {}
| MidTerm           {}
;

/*
* A type 3 opcode evaluates to an Integer and cannot have a destination operand
*/

Type3Opcode
: EISAIDTerm        {}
;

/* Obsolete
Type4Opcode
: ConcatTerm        {}
| ToDecimalStringTerm {}
| ToHexStringTerm   {}
| MidTerm           {}
| ToStringTerm      {}
;
*/

Type5Opcode
: ResourceTemplateTerm {}
| UnicodeTerm         {}
| ToUUIDTerm         {}
;

Type6Opcode
: RefOfTerm          {}
| DerefOfTerm        {}
| IndexTerm          {}
| UserTerm           {}
;

IncludeTerm
: PARSEOP_INCLUDE '(' {<n>$ = TrCreateLeafNode (PARSEOP_INCLUDE);}
String ')'           {TrLinkChildren (<n>3,1,$4);FIOpenIncludeFile ($4);}

```

```

TermList
  IncludeEndTerm      {$$ = TrLinkPeerNodes (3,$<n>3,$7,$8);}
;

IncludeEndTerm
: PARSEOP_INCLUDE_END  {$$ = TrCreateLeafNode (PARSEOP_INCLUDE_END);}
;

IncludeCStyleTerm
: PARSEOP_INCLUDE_CSTYLE
  String      {FIOpenIncludeFile ($2);}
;

LineTerm
: PARSEOP_LINE_CSTYLE
  Integer    {FlSetLineNumber ($2);}
;

ExternalTerm
: PARSEOP_EXTERNAL '('
  NameString
  OptionalObjectTypeKeyword
  OptionalParameterTypePackage
  OptionalParameterTypesPackage
  ')'          {$$ = TrCreateNode (PARSEOP_EXTERNAL,4,$3,$4,$5,$6);}
| PARSEOP_EXTERNAL '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

/***** Named Objects *****/

BankFieldTerm
: PARSEOP_BANKFIELD '('  {$<n>$ = TrCreateLeafNode (PARSEOP_BANKFIELD);}
  NameString
  NameStringItem
  TermArgItem
  ',' AccessTypeKeyword
  ',' LockRuleKeyword
  ',' UpdateRuleKeyword
  ')' '{'
  FieldUnitList ')'    {$$ = TrLinkChildren ($<n>3,7,$4,$5,$6,$8,$10,$12,$15);}
| PARSEOP_BANKFIELD '('
  error ')' '{' error ')'  {$$ = AslDoError(); yyclearin;}
;

FieldUnitList

```

```

:                               {$$ = NULL;}
| FieldUnit
| FieldUnitList ','           /* Allows a trailing comma at list end */
| FieldUnitList ','
  FieldUnit                   {$$ = TrLinkPeerNode ($1,$3);}
;

FieldUnit
: FieldUnitEntry             {}
| OffsetTerm                 {}
| AccessAsTerm               {}
| ConnectionTerm             {}
;

FieldUnitEntry
: ',' AmlPackageLengthTerm   {$$ = TrCreateNode (PARSEOP_RESERVED_BYTES,1,$2);}
| NameSeg ','
  AmlPackageLengthTerm       {$$ = TrLinkChildNode ($1,$3);}
;

OffsetTerm
: PARSEOP_OFFSET '('
  AmlPackageLengthTerm
  ')'                         {$$ = TrCreateNode (PARSEOP_OFFSET,1,$3);}
| PARSEOP_OFFSET '('
  error ')'                   {$$ = AslDoError(); yyclearin;}
;

AccessAsTerm
: PARSEOP_ACCESSAS '('
  AccessTypeKeyword
  OptionalAccessAttribTerm
  ')'                         {$$ = TrCreateNode (PARSEOP_ACCESSAS,2,$3,$4);}
| PARSEOP_ACCESSAS '('
  error ')'                   {$$ = AslDoError(); yyclearin;}
;

ConnectionTerm
: PARSEOP_CONNECTION '('
  NameString
  ')'                         {$$ = TrCreateNode (PARSEOP_CONNECTION,1,$3);}
| PARSEOP_CONNECTION '('     {$<n>$ = TrCreateLeafNode (PARSEOP_CONNECTION);}
  ResourceMacroTerm
  ')'                         {$$ = TrLinkChildren ($<n>3, 1,
  TrLinkChildren (TrCreateLeafNode (PARSEOP_RESOURCETEMPLATE), 3,
  TrCreateLeafNode (PARSEOP_DEFAULT_ARG),
  TrCreateLeafNode (PARSEOP_DEFAULT_ARG),
  $4));}

```

```

| PARSEOP_CONNECTION '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

CreateBitFieldTerm
: PARSEOP_CREATEBITFIELD '(' {$<n>$ = TrCreateLeafNode (PARSEOP_CREATEBITFIELD);}
  TermArg
  TermArgItem
  NameStringItem
  ')'              {$$ = TrLinkChildren ($<n>3,3,$4,$5,TrSetNodeFlags ($6,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_CREATEBITFIELD '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

CreateByteFieldTerm
: PARSEOP_CREATEBYTEFIELD '(' {$<n>$ = TrCreateLeafNode (PARSEOP_CREATEBYTEFIELD);}
  TermArg
  TermArgItem
  NameStringItem
  ')'              {$$ = TrLinkChildren ($<n>3,3,$4,$5,TrSetNodeFlags ($6,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_CREATEBYTEFIELD '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

CreateDWordFieldTerm
: PARSEOP_CREATEDWORDFIELD '(' {$<n>$ = TrCreateLeafNode (PARSEOP_CREATEDWORDFIELD);}
  TermArg
  TermArgItem
  NameStringItem
  ')'              {$$ = TrLinkChildren ($<n>3,3,$4,$5,TrSetNodeFlags ($6,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_CREATEDWORDFIELD '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

CreateFieldTerm
: PARSEOP_CREATEFIELD '(' {$<n>$ = TrCreateLeafNode (PARSEOP_CREATEFIELD);}
  TermArg
  TermArgItem
  TermArgItem
  NameStringItem
  ')'              {$$ = TrLinkChildren ($<n>3,4,$4,$5,$6,TrSetNodeFlags ($7,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_CREATEFIELD '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

CreateQWordFieldTerm

```
: PARSEOP_CREATEQWORDFIELD '(' {<n>$ = TrCreateLeafNode (PARSEOP_CREATEQWORDFIELD);}
  TermArg
  TermArgItem
  NameStringItem
  ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,TrSetNodeFlags ($6,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_CREATEQWORDFIELD '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;
```

CreateWordFieldTerm

```
: PARSEOP_CREATEWORDFIELD '(' {<n>$ = TrCreateLeafNode (PARSEOP_CREATEWORDFIELD);}
  TermArg
  TermArgItem
  NameStringItem
  ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,TrSetNodeFlags ($6,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_CREATEWORDFIELD '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;
```

DataRegionTerm

```
: PARSEOP_DATATABLEREGION '(' {<n>$ = TrCreateLeafNode (PARSEOP_DATATABLEREGION);}
  NameString
  TermArgItem
  TermArgItem
  TermArgItem
  ')'          {$$ = TrLinkChildren (<n>3,4,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$5,$6,$7);}
| PARSEOP_DATATABLEREGION '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;
```

DeviceTerm

```
: PARSEOP_DEVICE '(' {<n>$ = TrCreateLeafNode (PARSEOP_DEVICE);}
  NameString
  )'{'
  ObjectList '}'    {$$ = TrLinkChildren (<n>3,2,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$7);}
| PARSEOP_DEVICE '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;
```

EventTerm

```
: PARSEOP_EVENT '(' {<n>$ = TrCreateLeafNode (PARSEOP_EVENT);}
  NameString
```

```

    ')'          {$$ = TrLinkChildren ($<n>3,1,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION));}
  | PARSEOP_EVENT '('
    error ')'          {$$ = AslDoError(); yyclearin;}
;

```

FieldTerm

```

: PARSEOP_FIELD '('  {$<n>$ = TrCreateLeafNode (PARSEOP_FIELD);}
  NameString
  ',' AccessTypeKeyword
  ',' LockRuleKeyword
  ',' UpdateRuleKeyword
  ')' '{'
    FieldUnitList '}'  {$$ = TrLinkChildren ($<n>3,5,$4,$6,$8,$10,$13);}
| PARSEOP_FIELD '('
  error ')' '{' error '}'  {$$ = AslDoError(); yyclearin;}
;

```

FunctionTerm

```

: PARSEOP_FUNCTION '('  {$<n>$ = TrCreateLeafNode (PARSEOP_METHOD);}
  NameString
  OptionalParameterTypePackage
  OptionalParameterTypesPackage
  ')' '{'
    TermList '}'          {$$ = TrLinkChildren ($<n>3,7,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),
                                TrCreateValuedLeafNode (PARSEOP_BYTECONST, 0),
                                TrCreateLeafNode (PARSEOP_SERIALIZERULE_NOTSERIAL),
                                TrCreateValuedLeafNode (PARSEOP_BYTECONST, 0),$5,$6,$9);}
| PARSEOP_FUNCTION '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

IndexFieldTerm

```

: PARSEOP_INDEXFIELD '('  {$<n>$ = TrCreateLeafNode (PARSEOP_INDEXFIELD);}
  NameString
  NameStringItem
  ',' AccessTypeKeyword
  ',' LockRuleKeyword
  ',' UpdateRuleKeyword
  ')' '{'
    FieldUnitList '}'  {$$ = TrLinkChildren ($<n>3,6,$4,$5,$7,$9,$11,$14);}
| PARSEOP_INDEXFIELD '('
  error ')' '{' error '}'  {$$ = AslDoError(); yyclearin;}
;

```

MethodTerm

```

: PARSEOP_METHOD '('  {$<n>$ = TrCreateLeafNode (PARSEOP_METHOD);}

```



```

NameString
OptionalByteConstExpr    {UtCheckIntegerRange ($5, 0, 7);}
OptionalSerializeRuleKeyword
OptionalByteConstExpr
OptionalParameterTypePackage
OptionalParameterTypesPackage
)' '{
    TermList '}'          {$$ = TrLinkChildren ($<n>3,7,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$5,$7,$8,$9,$10,$13);}
| PARSEOP_METHOD '('
    error ')'           {$$ = AslDoError(); yyclearin;}
;

```

```

MutexTerm
: PARSEOP_MUTEX '('    {$<n>$ = TrCreateLeafNode (PARSEOP_MUTEX);}
    NameString
    ',' ByteConstExpr
    ')'                {$$ = TrLinkChildren ($<n>3,2,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$6);}
| PARSEOP_MUTEX '('
    error ')'           {$$ = AslDoError(); yyclearin;}
;

```

```

OpRegionTerm
: PARSEOP_OPERATIONREGION '(' {$<n>$ = TrCreateLeafNode (PARSEOP_OPERATIONREGION);}
    NameString
    ',' OpRegionSpaceIdTerm
    TermArgItem
    TermArgItem
    ')'                {$$ = TrLinkChildren ($<n>3,4,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$6,$7,$8);}
| PARSEOP_OPERATIONREGION '('
    error ')'           {$$ = AslDoError(); yyclearin;}
;

```

```

OpRegionSpaceIdTerm
: RegionSpaceKeyword    {}
| ByteConst             {$$ = UtCheckIntegerRange ($1, 0x80, 0xFF);}
;

```

```

PowerResTerm
: PARSEOP_POWERRESOURCE '(' {$<n>$ = TrCreateLeafNode (PARSEOP_POWERRESOURCE);}
    NameString
    ',' ByteConstExpr
    ',' WordConstExpr
    ')' '{
    ObjectList '}'      {$$ = TrLinkChildren ($<n>3,4,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$6,$8,$11);}
;

```

```
| PARSEOP_POWERRESOURCE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

ProcessorTerm

```
: PARSEOP_PROCESSOR '(' {$<n>$ = TrCreateLeafNode (PARSEOP_PROCESSOR);}
  NameString
  ',' ByteConstExpr
  OptionalDWordConstExpr
  OptionalByteConstExpr
  ')' '{
  ObjectList '}'      {$$ = TrLinkChildren ($<n>3,5,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$6,$7,$8,$11);}
| PARSEOP_PROCESSOR '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

ThermalZoneTerm

```
: PARSEOP_THERMALZONE '(' {$<n>$ = TrCreateLeafNode (PARSEOP_THERMALZONE);}
  NameString
  ')' '{
  ObjectList '}'      {$$ = TrLinkChildren ($<n>3,2,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$7);}
| PARSEOP_THERMALZONE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

/****** Namespace modifiers *****/

AliasTerm

```
: PARSEOP_ALIAS '(' {$<n>$ = TrCreateLeafNode (PARSEOP_ALIAS);}
  NameString
  NameStringItem
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,TrSetNodeFlags ($5,
NODE_IS_NAME_DECLARATION));}
| PARSEOP_ALIAS '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

NameTerm

```
: PARSEOP_NAME '(' {$<n>$ = TrCreateLeafNode (PARSEOP_NAME);}
  NameString
  ',' DataObject
  ')'          {$$ = TrLinkChildren ($<n>3,2,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$6);}
| PARSEOP_NAME '('
```

```

    error ')'          {$$ = AsIDoError(); yyclearin;}
;

ScopeTerm
: PARSEOP_SCOPE '('  {$<n>$ = TrCreateLeafNode (PARSEOP_SCOPE);}
  NameString
  ')' '{
    ObjectList '}'    {$$ = TrLinkChildren ($<n>3,2,TrSetNodeFlags ($4,
NODE_IS_NAME_DECLARATION),$7);}
| PARSEOP_SCOPE '('
  error ')'          {$$ = AsIDoError(); yyclearin;}
;

/***** Type 1 opcodes *****/

BreakTerm
: PARSEOP_BREAK     {$$ = TrCreateNode (PARSEOP_BREAK, 0);}
;

BreakPointTerm
: PARSEOP_BREAKPOINT {$$ = TrCreateNode (PARSEOP_BREAKPOINT, 0);}
;

ContinueTerm
: PARSEOP_CONTINUE  {$$ = TrCreateNode (PARSEOP_CONTINUE, 0);}
;

FatalTerm
: PARSEOP_FATAL '('  {$<n>$ = TrCreateLeafNode (PARSEOP_FATAL);}
  ByteConstExpr
  ' ' DWordConstExpr
  TermArgItem
  ')'          {$$ = TrLinkChildren ($<n>3,3,$4,$6,$7);}
| PARSEOP_FATAL '('
  error ')'    {$$ = AsIDoError(); yyclearin;}
;

IfElseTerm
: IfTerm ElseTerm    {$$ = TrLinkPeerNode ($1,$2);}
;

IfTerm
: PARSEOP_IF '('     {$<n>$ = TrCreateLeafNode (PARSEOP_IF);}
  TermArg
  ')' '{
    TermList '}'     {$$ = TrLinkChildren ($<n>3,2,$4,$7);}

```

```
| PARSEOP_IF '('  
  error ')'          {$$ = AslDoError(); yyclearin;}  
;
```

ElseTerm

```
:                {$$ = NULL;}  
| PARSEOP_ELSE '{'  {$<n>$ = TrCreateLeafNode (PARSEOP_ELSE);}  
  TermList '}'      {$$ = TrLinkChildren ($<n>3,1,$4);}  
  
| PARSEOP_ELSE '{'  
  error '}'        {$$ = AslDoError(); yyclearin;}  
  
| PARSEOP_ELSE  
  error            {$$ = AslDoError(); yyclearin;}  
  
| PARSEOP_ELSEIF '('  {$<n>$ = TrCreateLeafNode (PARSEOP_ELSE);}  
  TermArg   {$<n>$ = TrCreateLeafNode (PARSEOP_IF);}  
  ')' '{'  
    TermList '}'  {TrLinkChildren ($<n>5,2,$4,$8);}  
  ElseTerm      {TrLinkPeerNode ($<n>5,$11);}  
                {$$ = TrLinkChildren ($<n>3,1,$<n>5);}  
  
| PARSEOP_ELSEIF '('  
  error ')'        {$$ = AslDoError(); yyclearin;}  
  
| PARSEOP_ELSEIF  
  error            {$$ = AslDoError(); yyclearin;}  
;
```

LoadTerm

```
: PARSEOP_LOAD '('  {$<n>$ = TrCreateLeafNode (PARSEOP_LOAD);}  
  NameString  
  RequiredTarget  
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}  
| PARSEOP_LOAD '('  
  error ')'      {$$ = AslDoError(); yyclearin;}  
;
```

NoOpTerm

```
: PARSEOP_NOOP  {$$ = TrCreateNode (PARSEOP_NOOP, 0);}  
;
```

NotifyTerm

```
: PARSEOP_NOTIFY '('  {$<n>$ = TrCreateLeafNode (PARSEOP_NOTIFY);}  
  SuperName  
  TermArgItem  
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5)}
```

```

| PARSEOP_NOTIFY '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

ReleaseTerm
: PARSEOP_RELEASE '(' {$<n>$ = TrCreateLeafNode (PARSEOP_RELEASE);}
  SuperName
  ')'              {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_RELEASE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

ResetTerm
: PARSEOP_RESET '(' {$<n>$ = TrCreateLeafNode (PARSEOP_RESET);}
  SuperName
  ')'              {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_RESET '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

ReturnTerm
: PARSEOP_RETURN '(' {$<n>$ = TrCreateLeafNode (PARSEOP_RETURN);}
  OptionalReturnArg
  ')'              {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_RETURN   {$$ = TrLinkChildren (TrCreateLeafNode (PARSEOP_RETURN),1,TrSetNodeFlags
(TrCreateLeafNode (PARSEOP_ZERO), NODE_IS_NULL_RETURN));}
| PARSEOP_RETURN '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

SignalTerm
: PARSEOP_SIGNAL '(' {$<n>$ = TrCreateLeafNode (PARSEOP_SIGNAL);}
  SuperName
  ')'              {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_SIGNAL '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

SleepTerm
: PARSEOP_SLEEP '(' {$<n>$ = TrCreateLeafNode (PARSEOP_SLEEP);}
  TermArg
  ')'              {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_SLEEP '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

StallTerm
: PARSEOP_STALL '(' {$<n>$ = TrCreateLeafNode (PARSEOP_STALL);}

```

```

    TermArg
    ')'          {$$ = TrLinkChildren (<n>3,1,$4);}
| PARSEOP_STALL '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

SwitchTerm
: PARSEOP_SWITCH '(' {<n>$ = TrCreateLeafNode (PARSEOP_SWITCH);}
    TermArg
    ')' '{'
        CaseDefaultTermList ')'
            {$$ = TrLinkChildren (<n>3,2,$4,$7);}
| PARSEOP_SWITCH '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

/*
* Case-Default list; allow only one Default term and unlimited Case terms
*/

CaseDefaultTermList
:          {$$ = NULL;}
| CaseTerm {}
| DefaultTerm {}
| CaseDefaultTermList
    CaseTerm          {$$ = TrLinkPeerNode ($1,$2);}
| CaseDefaultTermList
    DefaultTerm       {$$ = TrLinkPeerNode ($1,$2);}

/* Original - attempts to force zero or one default term within the switch */

/*
CaseDefaultTermList
:          {$$ = NULL;}
| CaseTermList
    DefaultTerm
    CaseTermList      {$$ = TrLinkPeerNode ($1,TrLinkPeerNode ($2, $3));}
| CaseTermList
    CaseTerm          {$$ = TrLinkPeerNode ($1,$2);}
;

CaseTermList
:          {$$ = NULL;}
| CaseTerm      {}
| CaseTermList
    CaseTerm      {$$ = TrLinkPeerNode ($1,$2);}
;
*/

```

CaseTerm

```
: PARSEOP_CASE '(' {<n>$ = TrCreateLeafNode (PARSEOP_CASE);}
  DataObject
  ')' '{'
    TermList '}'      {$$ = TrLinkChildren (<n>3,2,$4,$7);}
| PARSEOP_CASE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

DefaultTerm

```
: PARSEOP_DEFAULT '{' {<n>$ = TrCreateLeafNode (PARSEOP_DEFAULT);}
  TermList '}'      {$$ = TrLinkChildren (<n>3,1,$4);}
| PARSEOP_DEFAULT '{'
  error '}'          {$$ = AslDoError(); yyclearin;}
;
```

UnloadTerm

```
: PARSEOP_UNLOAD '(' {<n>$ = TrCreateLeafNode (PARSEOP_UNLOAD);}
  SuperName
  ')'          {$$ = TrLinkChildren (<n>3,1,$4);}
| PARSEOP_UNLOAD '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;
```

WhileTerm

```
: PARSEOP_WHILE '(' {<n>$ = TrCreateLeafNode (PARSEOP_WHILE);}
  TermArg
  ')' '{' TermList '}'
    {$$ = TrLinkChildren (<n>3,2,$4,$7);}
| PARSEOP_WHILE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

/****** Type 2 opcodes *****/

AcquireTerm

```
: PARSEOP_ACQUIRE '(' {<n>$ = TrCreateLeafNode (PARSEOP_ACQUIRE);}
  SuperName
  ' WordConstExpr
  ')'          {$$ = TrLinkChildren (<n>3,2,$4,$6);}
| PARSEOP_ACQUIRE '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;
```

AddTerm

```
: PARSEOP_ADD '(' {<n>$ = TrCreateLeafNode (PARSEOP_ADD);}
;
```

```

TermArg
TermArgItem
Target
)'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_ADD '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

```

AndTerm
: PARSEOP_AND '('  {$<n>$ = TrCreateLeafNode (PARSEOP_AND);}
  TermArg
  TermArgItem
  Target
)'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_AND '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

```

ConcatTerm
: PARSEOP_CONCATENATE '('  {$<n>$ = TrCreateLeafNode (PARSEOP_CONCATENATE);}
  TermArg
  TermArgItem
  Target
)'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_CONCATENATE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

```

ConcatResTerm
: PARSEOP_CONCATENATERESTEMPLATE '('  {$<n>$ = TrCreateLeafNode
(PARSEOP_CONCATENATERESTEMPLATE);}
  TermArg
  TermArgItem
  Target
)'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_CONCATENATERESTEMPLATE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

```

CondRefOfTerm
: PARSEOP_CONDREFOF '('  {$<n>$ = TrCreateLeafNode (PARSEOP_CONDREFOF);}
  SuperName
  Target
)'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_CONDREFOF '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```


CopyObjectTerm

```
: PARSEOP_COPYOBJECT '(' {<n>$ = TrCreateLeafNode (PARSEOP_COPYOBJECT);}
  TermArg
  ',' SimpleTarget
  ')'          {$$ = TrLinkChildren (<n>3,2,$4,TrSetNodeFlags ($6, NODE_IS_TARGET));}
| PARSEOP_COPYOBJECT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

DecTerm

```
: PARSEOP_DECREMENT '(' {<n>$ = TrCreateLeafNode (PARSEOP_DECREMENT);}
  SuperName
  ')'          {$$ = TrLinkChildren (<n>3,1,$4);}
| PARSEOP_DECREMENT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

DerefOfTerm

```
: PARSEOP_DEREFEOF '(' {<n>$ = TrCreateLeafNode (PARSEOP_DEREFEOF);}
  TermArg
  ')'          {$$ = TrLinkChildren (<n>3,1,$4);}
| PARSEOP_DEREFEOF '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

DivideTerm

```
: PARSEOP_DIVIDE '(' {<n>$ = TrCreateLeafNode (PARSEOP_DIVIDE);}
  TermArg
  TermArgItem
  Target
  Target
  ')'          {$$ = TrLinkChildren (<n>3,4,$4,$5,$6,$7);}
| PARSEOP_DIVIDE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

FindSetLeftBitTerm

```
: PARSEOP_FINDSETLEFTBIT '(' {<n>$ = TrCreateLeafNode (PARSEOP_FINDSETLEFTBIT);}
  TermArg
  Target
  ')'          {$$ = TrLinkChildren (<n>3,2,$4,$5);}
| PARSEOP_FINDSETLEFTBIT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

FindSetRightBitTerm

```
: PARSEOP_FINDSETRIGHTBIT '(' {<n>$ = TrCreateLeafNode (PARSEOP_FINDSETRIGHTBIT);}
  TermArg
```

```

    Target
    ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_FINDSETRIGHTBIT '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

FromBCDTerm

```

: PARSEOP_FROMBCD '(' {$<n>$ = TrCreateLeafNode (PARSEOP_FROMBCD);}
    TermArg
    Target
    ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_FROMBCD '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

IncTerm

```

: PARSEOP_INCREMENT '(' {$<n>$ = TrCreateLeafNode (PARSEOP_INCREMENT);}
    SuperName
    ')'          {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_INCREMENT '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

IndexTerm

```

: PARSEOP_INDEX '(' {$<n>$ = TrCreateLeafNode (PARSEOP_INDEX);}
    TermArg
    TermArgItem
    Target
    ')'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_INDEX '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

LAndTerm

```

: PARSEOP_LAND '(' {$<n>$ = TrCreateLeafNode (PARSEOP_LAND);}
    TermArg
    TermArgItem
    ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_LAND '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

LEqualTerm

```

: PARSEOP_LEQUAL '(' {$<n>$ = TrCreateLeafNode (PARSEOP_LEQUAL);}
    TermArg
    TermArgItem
    ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_LEQUAL '('

```

```
error ')'          {$$ = AslDoError(); yyclearin;}
;
```

LGreaterTerm

```
: PARSEOP_LGREATER '('  {$<n>$ = TrCreateLeafNode (PARSEOP_LGREATER);}
  TermArg
  TermArgItem
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_LGREATER '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

LGreaterEqualTerm

```
: PARSEOP_LGREATEREQUAL '('  {$<n>$ = TrCreateLeafNode (PARSEOP_LLESS);}
  TermArg
  TermArgItem
  ')'          {$$ = TrCreateNode (PARSEOP_LNOT, 1, TrLinkChildren ($<n>3,2,$4,$5));}
| PARSEOP_LGREATEREQUAL '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

LLessTerm

```
: PARSEOP_LLESS '('  {$<n>$ = TrCreateLeafNode (PARSEOP_LLESS);}
  TermArg
  TermArgItem
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_LLESS '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

LLessEqualTerm

```
: PARSEOP_LLESSEQUAL '('  {$<n>$ = TrCreateLeafNode (PARSEOP_LGREATER);}
  TermArg
  TermArgItem
  ')'          {$$ = TrCreateNode (PARSEOP_LNOT, 1, TrLinkChildren ($<n>3,2,$4,$5));}
| PARSEOP_LLESSEQUAL '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

LNotTerm

```
: PARSEOP_LNOT '('  {$<n>$ = TrCreateLeafNode (PARSEOP_LNOT);}
  TermArg
  ')'          {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_LNOT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

LNotEqualTerm

```

: PARSEOP_LNOTEQUAL '(' {<n>$ = TrCreateLeafNode (PARSEOP_LEQUAL);}
  TermArg
  TermArgItem
  ')'          {$$ = TrCreateNode (PARSEOP_LNOT, 1, TrLinkChildren ($<n>3,2,$4,$5));}
| PARSEOP_LNOTEQUAL '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

LoadTableTerm

```

: PARSEOP_LOADTABLE '(' {<n>$ = TrCreateLeafNode (PARSEOP_LOADTABLE);}
  TermArg
  TermArgItem
  TermArgItem
  OptionalListString
  OptionalListString
  OptionalReference
  ')'          {$$ = TrLinkChildren ($<n>3,6,$4,$5,$6,$7,$8,$9);}
| PARSEOP_LOADTABLE '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

LORTerm

```

: PARSEOP_LOR '(' {<n>$ = TrCreateLeafNode (PARSEOP_LOR);}
  TermArg
  TermArgItem
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_LOR '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

MatchTerm

```

: PARSEOP_MATCH '(' {<n>$ = TrCreateLeafNode (PARSEOP_MATCH);}
  TermArg
  ',' MatchOpKeyword
  TermArgItem
  ',' MatchOpKeyword
  TermArgItem
  TermArgItem
  ')'          {$$ = TrLinkChildren ($<n>3,6,$4,$6,$7,$9,$10,$11);}
| PARSEOP_MATCH '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

MidTerm

```

: PARSEOP_MID '(' {<n>$ = TrCreateLeafNode (PARSEOP_MID);}
  TermArg
  TermArgItem
  TermArgItem

```

```

    Target
    ')'          {$$ = TrLinkChildren (<n>3,4,$4,$5,$6,$7);}
| PARSEOP_MID '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

ModTerm

```

: PARSEOP_MOD '('  {$<n>$ = TrCreateLeafNode (PARSEOP_MOD);}
    TermArg
    TermArgItem
    Target
    ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,$6);}
| PARSEOP_MOD '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

MultiplyTerm

```

: PARSEOP_MULTIPLY '('  {$<n>$ = TrCreateLeafNode (PARSEOP_MULTIPLY);}
    TermArg
    TermArgItem
    Target
    ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,$6);}
| PARSEOP_MULTIPLY '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

NAndTerm

```

: PARSEOP_NAND '('  {$<n>$ = TrCreateLeafNode (PARSEOP_NAND);}
    TermArg
    TermArgItem
    Target
    ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,$6);}
| PARSEOP_NAND '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

NOrTerm

```

: PARSEOP_NOR '('  {$<n>$ = TrCreateLeafNode (PARSEOP_NOR);}
    TermArg
    TermArgItem
    Target
    ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,$6);}
| PARSEOP_NOR '('
    error ')'    {$$ = AslDoError(); yyclearin;}
;

```

NotTerm

```

: PARSEOP_NOT '('  {$<n>$ = TrCreateLeafNode (PARSEOP_NOT);}

```

```

TermArg
Target
)'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_NOT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

ObjectTypeTerm
: PARSEOP_OBJECTTYPE '(' {$<n>$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE);}
  SuperName
  ')'          {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_OBJECTTYPE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

OrTerm
: PARSEOP_OR '(' {$<n>$ = TrCreateLeafNode (PARSEOP_OR);}
  TermArg
  TermArgItem
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_OR '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

/*
* In RefOf, the node isn't really a target, but we can't keep track of it after
* we've taken a pointer to it. (hard to tell if a local becomes initialized this way.)
*/
RefOfTerm
: PARSEOP_REFOF '(' {$<n>$ = TrCreateLeafNode (PARSEOP_REFOF);}
  SuperName
  ')'          {$$ = TrLinkChildren ($<n>3,1,TrSetNodeFlags ($4, NODE_IS_TARGET));}
| PARSEOP_REFOF '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

ShiftLeftTerm
: PARSEOP_SHIFTLEFT '(' {$<n>$ = TrCreateLeafNode (PARSEOP_SHIFTLEFT);}
  TermArg
  TermArgItem
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_SHIFTLEFT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

ShiftRightTerm

```

```

: PARSEOP_SHIFTRIGHT '(' {<n>$ = TrCreateLeafNode (PARSEOP_SHIFTRIGHT);}
  TermArg
  TermArgItem
  Target
  ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,$6);}
| PARSEOP_SHIFTRIGHT '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

SizeOfTerm

```

: PARSEOP_SIZEOF '(' {<n>$ = TrCreateLeafNode (PARSEOP_SIZEOF);}
  SuperName
  ')'          {$$ = TrLinkChildren (<n>3,1,$4);}
| PARSEOP_SIZEOF '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

StoreTerm

```

: PARSEOP_STORE '(' {<n>$ = TrCreateLeafNode (PARSEOP_STORE);}
  TermArg
  ' SuperName
  ')'          {$$ = TrLinkChildren (<n>3,2,$4,TrSetNodeFlags ($6, NODE_IS_TARGET));}
| PARSEOP_STORE '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

SubtractTerm

```

: PARSEOP_SUBTRACT '(' {<n>$ = TrCreateLeafNode (PARSEOP_SUBTRACT);}
  TermArg
  TermArgItem
  Target
  ')'          {$$ = TrLinkChildren (<n>3,3,$4,$5,$6);}
| PARSEOP_SUBTRACT '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

TimerTerm

```

: PARSEOP_TIMER '(' {<n>$ = TrCreateLeafNode (PARSEOP_TIMER);}
  ')'          {$$ = TrLinkChildren (<n>3,0);}
| PARSEOP_TIMER      {$$ = TrLinkChildren (TrCreateLeafNode (PARSEOP_TIMER),0);}
| PARSEOP_TIMER '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

ToBCDTerm

```

: PARSEOP_TOBCD '(' {<n>$ = TrCreateLeafNode (PARSEOP_TOBCD);}
  TermArg
  Target

```

```

    ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_TOBCD '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

ToBufferTerm

```

: PARSEOP_TOBUFFER '(' { $<n>$ = TrCreateLeafNode (PARSEOP_TOBUFFER);}
  TermArg
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_TOBUFFER '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

ToDecimalStringTerm

```

: PARSEOP_TODECIMALSTRING '(' { $<n>$ = TrCreateLeafNode (PARSEOP_TODECIMALSTRING);}
  TermArg
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_TODECIMALSTRING '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

ToHexStringTerm

```

: PARSEOP_TOHEXSTRING '(' { $<n>$ = TrCreateLeafNode (PARSEOP_TOHEXSTRING);}
  TermArg
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_TOHEXSTRING '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

ToIntegerTerm

```

: PARSEOP_TOINTEGER '(' { $<n>$ = TrCreateLeafNode (PARSEOP_TOINTEGER);}
  TermArg
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_TOINTEGER '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;

```

ToStringTerm

```

: PARSEOP_TOSTRING '(' { $<n>$ = TrCreateLeafNode (PARSEOP_TOSTRING);}
  TermArg
  OptionalCount
  Target
  ')'          {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_TOSTRING '('

```



```

    error ')'          {$$ = AslDoError(); yyclearin;}
;

ToUUIDTerm
: PARSEOP_TOUUID '('
  StringData ')'      {$$ = TrUpdateNode (PARSEOP_TOUUID, $3);}
| PARSEOP_TOUUID '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

WaitTerm
: PARSEOP_WAIT '('   {$<n>$ = TrCreateLeafNode (PARSEOP_WAIT);}
  SuperName
  TermArgItem
  ')'                {$$ = TrLinkChildren ($<n>3,2,$4,$5);}
| PARSEOP_WAIT '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

XOrTerm
: PARSEOP_XOR '('   {$<n>$ = TrCreateLeafNode (PARSEOP_XOR);}
  TermArg
  TermArgItem
  Target
  ')'                {$$ = TrLinkChildren ($<n>3,3,$4,$5,$6);}
| PARSEOP_XOR '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

/***** Keywords *****/

AccessAttribKeyword
: PARSEOP_ACCESSATTRIB_BLOCK      {$$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_BLOCK);}
| PARSEOP_ACCESSATTRIB_BLOCK_CALL  {$$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_BLOCK_CALL);}
| PARSEOP_ACCESSATTRIB_BYTE        {$$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_BYTE);}
| PARSEOP_ACCESSATTRIB_QUICK       {$$ = TrCreateLeafNode (PARSEOP_ACCESSATTRIB_QUICK
);}
| PARSEOP_ACCESSATTRIB_SND_RCV     {$$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_SND_RCV);}
| PARSEOP_ACCESSATTRIB_WORD        {$$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_WORD);}
| PARSEOP_ACCESSATTRIB_WORD_CALL   {$$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_WORD_CALL);}

```

```

| PARSEOP_ACCESSATTRIB_MULTIBYTE '(' {$<n>$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_MULTIBYTE);}
  ByteConst
  ')'          {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_ACCESSATTRIB_RAW_BYTES '(' {$<n>$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_RAW_BYTES);}
  ByteConst
  ')'          {$$ = TrLinkChildren ($<n>3,1,$4);}
| PARSEOP_ACCESSATTRIB_RAW_PROCESS '(' {$<n>$ = TrCreateLeafNode
(PARSEOP_ACCESSATTRIB_RAW_PROCESS);}
  ByteConst
  ')'          {$$ = TrLinkChildren ($<n>3,1,$4);}
;

```

AccessTypeKeyword

```

: PARSEOP_ACCESSTYPE_ANY          {$$ = TrCreateLeafNode (PARSEOP_ACCESSTYPE_ANY);}
| PARSEOP_ACCESSTYPE_BYTE         {$$ = TrCreateLeafNode (PARSEOP_ACCESSTYPE_BYTE);}
| PARSEOP_ACCESSTYPE_WORD         {$$ = TrCreateLeafNode (PARSEOP_ACCESSTYPE_WORD);}
| PARSEOP_ACCESSTYPE_DWORD        {$$ = TrCreateLeafNode
(PARSEOP_ACCESSTYPE_DWORD);}
| PARSEOP_ACCESSTYPE_QWORD        {$$ = TrCreateLeafNode
(PARSEOP_ACCESSTYPE_QWORD);}
| PARSEOP_ACCESSTYPE_BUF          {$$ = TrCreateLeafNode (PARSEOP_ACCESSTYPE_BUF);}
;

```

AddressingModeKeyword

```

: PARSEOP_ADDRESSINGMODE_7BIT     {$$ = TrCreateLeafNode
(PARSEOP_ADDRESSINGMODE_7BIT);}
| PARSEOP_ADDRESSINGMODE_10BIT    {$$ = TrCreateLeafNode
(PARSEOP_ADDRESSINGMODE_10BIT);}
;

```

AddressKeyword

```

: PARSEOP_ADDRESSTYPE_MEMORY      {$$ = TrCreateLeafNode
(PARSEOP_ADDRESSTYPE_MEMORY);}
| PARSEOP_ADDRESSTYPE_RESERVED    {$$ = TrCreateLeafNode
(PARSEOP_ADDRESSTYPE_RESERVED);}
| PARSEOP_ADDRESSTYPE_NVS         {$$ = TrCreateLeafNode (PARSEOP_ADDRESSTYPE_NVS);}
| PARSEOP_ADDRESSTYPE ACPI        {$$ = TrCreateLeafNode (PARSEOP_ADDRESSTYPE ACPI);}
;

```

AddressSpaceKeyword

```

: ByteConst      {$$ = UtCheckIntegerRange ($1, 0x80, 0xFF);}
| RegionSpaceKeyword {}
;

```

BitsPerByteKeyword

```

: PARSEOP_BITSPERBYTE_FIVE        {$$ = TrCreateLeafNode (PARSEOP_BITSPERBYTE_FIVE);}

```

```

| PARSEOP_BITSPERBYTE_SIX      {$$ = TrCreateLeafNode (PARSEOP_BITSPERBYTE_SIX);}
| PARSEOP_BITSPERBYTE_SEVEN   {$$ = TrCreateLeafNode (PARSEOP_BITSPERBYTE_SEVEN);}
| PARSEOP_BITSPERBYTE_EIGHT   {$$ = TrCreateLeafNode (PARSEOP_BITSPERBYTE_EIGHT);}
| PARSEOP_BITSPERBYTE_NINE    {$$ = TrCreateLeafNode (PARSEOP_BITSPERBYTE_NINE);}
;

ClockPhaseKeyword
: PARSEOP_CLOCKPHASE_FIRST    {$$ = TrCreateLeafNode (PARSEOP_CLOCKPHASE_FIRST);}
| PARSEOP_CLOCKPHASE_SECOND   {$$ = TrCreateLeafNode
(PARSEOP_CLOCKPHASE_SECOND);}
;

ClockPolarityKeyword
: PARSEOP_CLOCKPOLARITY_LOW   {$$ = TrCreateLeafNode
(PARSEOP_CLOCKPOLARITY_LOW);}
| PARSEOP_CLOCKPOLARITY_HIGH  {$$ = TrCreateLeafNode
(PARSEOP_CLOCKPOLARITY_HIGH);}
;

DecodeKeyword
: PARSEOP_DECODETYPE_POS      {$$ = TrCreateLeafNode (PARSEOP_DECODETYPE_POS);}
| PARSEOP_DECODETYPE_SUB      {$$ = TrCreateLeafNode (PARSEOP_DECODETYPE_SUB);}
;

DevicePolarityKeyword
: PARSEOP_DEVICEPOLARITY_LOW  {$$ = TrCreateLeafNode
(PARSEOP_DEVICEPOLARITY_LOW);}
| PARSEOP_DEVICEPOLARITY_HIGH {$$ = TrCreateLeafNode
(PARSEOP_DEVICEPOLARITY_HIGH);}
;

DMATypeKeyword
: PARSEOP_DMATYPE_A           {$$ = TrCreateLeafNode (PARSEOP_DMATYPE_A);}
| PARSEOP_DMATYPE_COMPATIBILITY {$$ = TrCreateLeafNode
(PARSEOP_DMATYPE_COMPATIBILITY);}
| PARSEOP_DMATYPE_B           {$$ = TrCreateLeafNode (PARSEOP_DMATYPE_B);}
| PARSEOP_DMATYPE_F           {$$ = TrCreateLeafNode (PARSEOP_DMATYPE_F);}
;

EndianKeyword
: PARSEOP_ENDIAN_LITTLE       {$$ = TrCreateLeafNode (PARSEOP_ENDIAN_LITTLE);}
| PARSEOP_ENDIAN_BIG          {$$ = TrCreateLeafNode (PARSEOP_ENDIAN_BIG);}
;

FlowControlKeyword
: PARSEOP_FLOWCONTROL_HW      {$$ = TrCreateLeafNode (PARSEOP_FLOWCONTROL_HW);}
| PARSEOP_FLOWCONTROL_NONE    {$$ = TrCreateLeafNode
(PARSEOP_FLOWCONTROL_NONE);}

```

```

| PARSEOP_FLOWCONTROL_SW      {$$ = TrCreateLeafNode (PARSEOP_FLOWCONTROL_SW);}
;

InterruptLevel
: PARSEOP_INTLEVEL_ACTIVEBOTH  {$$ = TrCreateLeafNode
(PARSEOP_INTLEVEL_ACTIVEBOTH);}
| PARSEOP_INTLEVEL_ACTIVEHIGH  {$$ = TrCreateLeafNode
(PARSEOP_INTLEVEL_ACTIVEHIGH);}
| PARSEOP_INTLEVEL_ACTIVELOW   {$$ = TrCreateLeafNode
(PARSEOP_INTLEVEL_ACTIVELOW);}
;

InterruptTypeKeyword
: PARSEOP_INTTYPE_EDGE        {$$ = TrCreateLeafNode (PARSEOP_INTTYPE_EDGE);}
| PARSEOP_INTTYPE_LEVEL       {$$ = TrCreateLeafNode (PARSEOP_INTTYPE_LEVEL);}
;

IODecodeKeyword
: PARSEOP_IODECODETYPE_16     {$$ = TrCreateLeafNode (PARSEOP_IODECODETYPE_16);}
| PARSEOP_IODECODETYPE_10     {$$ = TrCreateLeafNode (PARSEOP_IODECODETYPE_10);}
;

IoRestrictionKeyword
: PARSEOP_IORESTRICT_IN       {$$ = TrCreateLeafNode (PARSEOP_IORESTRICT_IN);}
| PARSEOP_IORESTRICT_OUT      {$$ = TrCreateLeafNode (PARSEOP_IORESTRICT_OUT);}
| PARSEOP_IORESTRICT_NONE     {$$ = TrCreateLeafNode (PARSEOP_IORESTRICT_NONE);}
| PARSEOP_IORESTRICT_PRESERVE {$$ = TrCreateLeafNode
(PARSEOP_IORESTRICT_PRESERVE);}
;

LockRuleKeyword
: PARSEOP_LOCKRULE_LOCK       {$$ = TrCreateLeafNode (PARSEOP_LOCKRULE_LOCK);}
| PARSEOP_LOCKRULE_NOLOCK     {$$ = TrCreateLeafNode (PARSEOP_LOCKRULE_NOLOCK);}
;

MatchOpKeyword
: PARSEOP_MATCHTYPE_MTR       {$$ = TrCreateLeafNode (PARSEOP_MATCHTYPE_MTR);}
| PARSEOP_MATCHTYPE_MEQ       {$$ = TrCreateLeafNode (PARSEOP_MATCHTYPE_MEQ);}
| PARSEOP_MATCHTYPE_MLE       {$$ = TrCreateLeafNode (PARSEOP_MATCHTYPE_MLE);}
| PARSEOP_MATCHTYPE_MLT       {$$ = TrCreateLeafNode (PARSEOP_MATCHTYPE_MLT);}
| PARSEOP_MATCHTYPE_MGE       {$$ = TrCreateLeafNode (PARSEOP_MATCHTYPE_MGE);}
| PARSEOP_MATCHTYPE_MGT       {$$ = TrCreateLeafNode (PARSEOP_MATCHTYPE_MGT);}
;

MaxKeyword
: PARSEOP_MAXTYPE_FIXED       {$$ = TrCreateLeafNode (PARSEOP_MAXTYPE_FIXED);}
| PARSEOP_MAXTYPE_NOTFIXED    {$$ = TrCreateLeafNode
(PARSEOP_MAXTYPE_NOTFIXED);}

```

;

MemTypeKeyword

```
: PARSEOP_MEMTYPE_CACHEABLE          {$$ = TrCreateLeafNode
(PARSEOP_MEMTYPE_CACHEABLE);}
| PARSEOP_MEMTYPE_WRITECOMBINING      {$$ = TrCreateLeafNode
(PARSEOP_MEMTYPE_WRITECOMBINING);}
| PARSEOP_MEMTYPE_PREFETCHABLE        {$$ = TrCreateLeafNode
(PARSEOP_MEMTYPE_PREFETCHABLE);}
| PARSEOP_MEMTYPE_NONCACHEABLE        {$$ = TrCreateLeafNode
(PARSEOP_MEMTYPE_NONCACHEABLE);}
;
```

MinKeyword

```
: PARSEOP_MINTYPE_FIXED                {$$ = TrCreateLeafNode (PARSEOP_MINTYPE_FIXED);}
| PARSEOP_MINTYPE_NOTFIXED             {$$ = TrCreateLeafNode (PARSEOP_MINTYPE_NOTFIXED);}
;
```

ObjectTypeKeyword

```
: PARSEOP_OBJECTTYPE_UNK              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_UNK);}
| PARSEOP_OBJECTTYPE_INT              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_INT);}
| PARSEOP_OBJECTTYPE_STR              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_STR);}
| PARSEOP_OBJECTTYPE_BUF              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_BUF);}
| PARSEOP_OBJECTTYPE_PKG              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_PKG);}
| PARSEOP_OBJECTTYPE_FLD              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_FLD);}
| PARSEOP_OBJECTTYPE_DEV              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_DEV);}
| PARSEOP_OBJECTTYPE_EVT              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_EVT);}
| PARSEOP_OBJECTTYPE_MTH              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_MTH);}
| PARSEOP_OBJECTTYPE_MTX              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_MTX);}
| PARSEOP_OBJECTTYPE_OPR              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_OPR);}
| PARSEOP_OBJECTTYPE_POW              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_POW);}
| PARSEOP_OBJECTTYPE_PRO              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_PRO);}
| PARSEOP_OBJECTTYPE_THZ              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_THZ);}
| PARSEOP_OBJECTTYPE_BFF              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_BFF);}
| PARSEOP_OBJECTTYPE_DDB              {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_DDB);}
;
```

ParityTypeKeyword

```
: PARSEOP_PARITYTYPE_SPACE            {$$ = TrCreateLeafNode (PARSEOP_PARITYTYPE_SPACE);}
| PARSEOP_PARITYTYPE_MARK            {$$ = TrCreateLeafNode (PARSEOP_PARITYTYPE_MARK);}
| PARSEOP_PARITYTYPE_ODD            {$$ = TrCreateLeafNode (PARSEOP_PARITYTYPE_ODD);}
| PARSEOP_PARITYTYPE_EVEN            {$$ = TrCreateLeafNode (PARSEOP_PARITYTYPE_EVEN);}
| PARSEOP_PARITYTYPE_NONE            {$$ = TrCreateLeafNode (PARSEOP_PARITYTYPE_NONE);}
;
```

PinConfigByte

```
: PinConfigKeyword                    {$$ = $1;}
| ByteConstExpr                       {$$ = UtCheckIntegerRange ($1, 0x80, 0xFF);}
;
```

```

;

PinConfigKeyword
: PARSEOP_PIN_NOPULL          {$$ = TrCreateLeafNode (PARSEOP_PIN_NOPULL);}
| PARSEOP_PIN_PULLDOWN       {$$ = TrCreateLeafNode (PARSEOP_PIN_PULLDOWN);}
| PARSEOP_PIN_PULLUP         {$$ = TrCreateLeafNode (PARSEOP_PIN_PULLUP);}
| PARSEOP_PIN_PULLDEFAULT    {$$ = TrCreateLeafNode (PARSEOP_PIN_PULLDEFAULT);}
;

RangeTypeKeyword
: PARSEOP_RANGETYPE_ISAONLY   {$$ = TrCreateLeafNode
(PARSEOP_RANGETYPE_ISAONLY);}
| PARSEOP_RANGETYPE_NONISAONLY {$$ = TrCreateLeafNode
(PARSEOP_RANGETYPE_NONISAONLY);}
| PARSEOP_RANGETYPE_ENTIRE    {$$ = TrCreateLeafNode (PARSEOP_RANGETYPE_ENTIRE);}
;

RegionSpaceKeyword
: PARSEOP_REGIONSPACE_IO      {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_IO);}
| PARSEOP_REGIONSPACE_MEM     {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_MEM);}
| PARSEOP_REGIONSPACE_PCI     {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_PCI);}
| PARSEOP_REGIONSPACE_EC      {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_EC);}
| PARSEOP_REGIONSPACE_SMBUS   {$$ = TrCreateLeafNode
(PARSEOP_REGIONSPACE_SMBUS);}
| PARSEOP_REGIONSPACE_CMOS    {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_CMOS);}
| PARSEOP_REGIONSPACE_PCIBAR  {$$ = TrCreateLeafNode
(PARSEOP_REGIONSPACE_PCIBAR);}
| PARSEOP_REGIONSPACE_IPMI    {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_IPMI);}
| PARSEOP_REGIONSPACE_GPIO    {$$ = TrCreateLeafNode (PARSEOP_REGIONSPACE_GPIO);}
| PARSEOP_REGIONSPACE_GSBUS   {$$ = TrCreateLeafNode
(PARSEOP_REGIONSPACE_GSBUS);}
| PARSEOP_REGIONSPACE_FFIXEDHW {$$ = TrCreateLeafNode
(PARSEOP_REGIONSPACE_FFIXEDHW);}
;

ResourceTypeKeyword
: PARSEOP_RESOURCECTYPE_CONSUMER {$$ = TrCreateLeafNode
(PARSEOP_RESOURCECTYPE_CONSUMER);}
| PARSEOP_RESOURCECTYPE_PRODUCER {$$ = TrCreateLeafNode
(PARSEOP_RESOURCECTYPE_PRODUCER);}
;

SerializeRuleKeyword
: PARSEOP_SERIALIZERULE_SERIAL {$$ = TrCreateLeafNode
(PARSEOP_SERIALIZERULE_SERIAL);}
| PARSEOP_SERIALIZERULE_NOTSERIAL {$$ = TrCreateLeafNode
(PARSEOP_SERIALIZERULE_NOTSERIAL);}
;

```

ShareTypeKeyword

```
: PARSEOP_SHARETYPE_SHARED      {$$ = TrCreateLeafNode
(PARSEOP_SHARETYPE_SHARED);}
| PARSEOP_SHARETYPE_EXCLUSIVE    {$$ = TrCreateLeafNode
(PARSEOP_SHARETYPE_EXCLUSIVE);}
| PARSEOP_SHARETYPE_SHAREDWAKE   {$$ = TrCreateLeafNode
(PARSEOP_SHARETYPE_SHAREDWAKE);}
| PARSEOP_SHARETYPE_EXCLUSIVWAKE {$$ = TrCreateLeafNode
(PARSEOP_SHARETYPE_EXCLUSIVWAKE);}
;
```

SlaveModeKeyword

```
: PARSEOP_SLAVEMODE_CONTROLLERINIT {$$ = TrCreateLeafNode
(PARSEOP_SLAVEMODE_CONTROLLERINIT);}
| PARSEOP_SLAVEMODE_DEVICEINIT     {$$ = TrCreateLeafNode
(PARSEOP_SLAVEMODE_DEVICEINIT);}
;
```

StopBitsKeyword

```
: PARSEOP_STOPBITS_TWO          {$$ = TrCreateLeafNode (PARSEOP_STOPBITS_TWO);}
| PARSEOP_STOPBITS_ONEPLUSHALF  {$$ = TrCreateLeafNode
(PARSEOP_STOPBITS_ONEPLUSHALF);}
| PARSEOP_STOPBITS_ONE          {$$ = TrCreateLeafNode (PARSEOP_STOPBITS_ONE);}
| PARSEOP_STOPBITS_ZERO         {$$ = TrCreateLeafNode (PARSEOP_STOPBITS_ZERO);}
;
```

TranslationKeyword

```
: PARSEOP_TRANSLATIONTYPE_SPARSE {$$ = TrCreateLeafNode
(PARSEOP_TRANSLATIONTYPE_SPARSE);}
| PARSEOP_TRANSLATIONTYPE_DENSE   {$$ = TrCreateLeafNode
(PARSEOP_TRANSLATIONTYPE_DENSE);}
;
```

TypeKeyword

```
: PARSEOP_TYPE_TRANSLATION      {$$ = TrCreateLeafNode (PARSEOP_TYPE_TRANSLATION);}
| PARSEOP_TYPE_STATIC           {$$ = TrCreateLeafNode (PARSEOP_TYPE_STATIC);}
;
```

UpdateRuleKeyword

```
: PARSEOP_UPDATERULE_PRESERVE   {$$ = TrCreateLeafNode
(PARSEOP_UPDATERULE_PRESERVE);}
| PARSEOP_UPDATERULE_ONES       {$$ = TrCreateLeafNode (PARSEOP_UPDATERULE_ONES);}
| PARSEOP_UPDATERULE_ZEROS     {$$ = TrCreateLeafNode (PARSEOP_UPDATERULE_ZEROS);}
;
```

WireModeKeyword

```
: PARSEOP_WIREMODE_FOUR        {$$ = TrCreateLeafNode (PARSEOP_WIREMODE_FOUR);}
;
```

```

| PARSEOP_WIREMODE_THREE      {$$ = TrCreateLeafNode (PARSEOP_WIREMODE_THREE);}
;

XferSizeKeyword
: PARSEOP_XFERSIZE_8         {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_8, 0);}
| PARSEOP_XFERSIZE_16        {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_16, 1);}
| PARSEOP_XFERSIZE_32        {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_32, 2);}
| PARSEOP_XFERSIZE_64        {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_64, 3);}
| PARSEOP_XFERSIZE_128       {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_128, 4);}
| PARSEOP_XFERSIZE_256       {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_256, 5);}
;

XferTypeKeyword
: PARSEOP_XFERTYPE_8         {$$ = TrCreateLeafNode (PARSEOP_XFERTYPE_8);}
| PARSEOP_XFERTYPE_8_16     {$$ = TrCreateLeafNode (PARSEOP_XFERTYPE_8_16);}
| PARSEOP_XFERTYPE_16       {$$ = TrCreateLeafNode (PARSEOP_XFERTYPE_16);}
;

/***** Miscellaneous Types *****/

SuperName
: NameString                 {}
| ArgTerm                     {}
| LocalTerm                   {}
| DebugTerm                   {}
| Type6Opcode                 {}
/* | UserTerm                  {} */ /* Caused reduce/reduce with Type6Opcode->UserTerm */
;

ArgTerm
: PARSEOP_ARG0               {$$ = TrCreateLeafNode (PARSEOP_ARG0);}
| PARSEOP_ARG1               {$$ = TrCreateLeafNode (PARSEOP_ARG1);}
| PARSEOP_ARG2               {$$ = TrCreateLeafNode (PARSEOP_ARG2);}
| PARSEOP_ARG3               {$$ = TrCreateLeafNode (PARSEOP_ARG3);}
| PARSEOP_ARG4               {$$ = TrCreateLeafNode (PARSEOP_ARG4);}
| PARSEOP_ARG5               {$$ = TrCreateLeafNode (PARSEOP_ARG5);}
| PARSEOP_ARG6               {$$ = TrCreateLeafNode (PARSEOP_ARG6);}
;

LocalTerm
: PARSEOP_LOCAL0             {$$ = TrCreateLeafNode (PARSEOP_LOCAL0);}
| PARSEOP_LOCAL1             {$$ = TrCreateLeafNode (PARSEOP_LOCAL1);}
| PARSEOP_LOCAL2             {$$ = TrCreateLeafNode (PARSEOP_LOCAL2);}
| PARSEOP_LOCAL3             {$$ = TrCreateLeafNode (PARSEOP_LOCAL3);}
| PARSEOP_LOCAL4             {$$ = TrCreateLeafNode (PARSEOP_LOCAL4);}
| PARSEOP_LOCAL5             {$$ = TrCreateLeafNode (PARSEOP_LOCAL5);}

```



```

| PARSEOP_LOCAL6      {$$ = TrCreateLeafNode (PARSEOP_LOCAL6);}
| PARSEOP_LOCAL7      {$$ = TrCreateLeafNode (PARSEOP_LOCAL7);}
;

DebugTerm
: PARSEOP_DEBUG      {$$ = TrCreateLeafNode (PARSEOP_DEBUG);}
;

ByteConst
: Integer            {$$ = TrUpdateNode (PARSEOP_BYTECONST, $1);}
;

WordConst
: Integer            {$$ = TrUpdateNode (PARSEOP_WORDCONST, $1);}
;

DWordConst
: Integer            {$$ = TrUpdateNode (PARSEOP_DWORDCONST, $1);}
;

QWordConst
: Integer            {$$ = TrUpdateNode (PARSEOP_QWORDCONST, $1);}
;

Integer
: PARSEOP_INTEGER     {$$ = TrCreateValuedLeafNode (PARSEOP_INTEGER, AslCompilerIval.i);}
;

String
: PARSEOP_STRING_LITERAL  {$$ = TrCreateValuedLeafNode (PARSEOP_STRING_LITERAL,
(ACPI_NATIVE_INT) AslCompilerIval.s);}
;

ConstTerm
: ConstExprTerm      {}
| PARSEOP_REVISION     {$$ = TrCreateLeafNode (PARSEOP_REVISION);}
;

ConstExprTerm
: PARSEOP_ZERO        {$$ = TrCreateValuedLeafNode (PARSEOP_ZERO, 0);}
| PARSEOP_ONE         {$$ = TrCreateValuedLeafNode (PARSEOP_ONE, 1);}
| PARSEOP_ONES        {$$ = TrCreateValuedLeafNode (PARSEOP_ONES, ACPI_UINT64_MAX);}
| PARSEOP__DATE__     {$$ = TrCreateConstantLeafNode (PARSEOP__DATE__);}
| PARSEOP__FILE__     {$$ = TrCreateConstantLeafNode (PARSEOP__FILE__);}
| PARSEOP__LINE__     {$$ = TrCreateConstantLeafNode (PARSEOP__LINE__);}
| PARSEOP__PATH__     {$$ = TrCreateConstantLeafNode (PARSEOP__PATH__);}
;

```

```

ByteConstExpr
: Type3Opcode      {$$ = TrUpdateNode (PARSEOP_BYTECONST, $1);}
| Type2IntegerOpcode  {$$ = TrUpdateNode (PARSEOP_BYTECONST, $1);}
| ConstExprTerm      {$$ = TrUpdateNode (PARSEOP_BYTECONST, $1);}
| ByteConst          {}
;

```

```

WordConstExpr
: Type3Opcode      {$$ = TrUpdateNode (PARSEOP_WORDCONST, $1);}
| Type2IntegerOpcode  {$$ = TrUpdateNode (PARSEOP_WORDCONST, $1);}
| ConstExprTerm      {$$ = TrUpdateNode (PARSEOP_WORDCONST, $1);}
| WordConst          {}
;

```

```

DWordConstExpr
: Type3Opcode      {$$ = TrUpdateNode (PARSEOP_DWORDCONST, $1);}
| Type2IntegerOpcode  {$$ = TrUpdateNode (PARSEOP_DWORDCONST, $1);}
| ConstExprTerm      {$$ = TrUpdateNode (PARSEOP_DWORDCONST, $1);}
| DWordConst          {}
;

```

```

QWordConstExpr
: Type3Opcode      {$$ = TrUpdateNode (PARSEOP_QWORDCONST, $1);}
| Type2IntegerOpcode  {$$ = TrUpdateNode (PARSEOP_QWORDCONST, $1);}
| ConstExprTerm      {$$ = TrUpdateNode (PARSEOP_QWORDCONST, $1);}
| QWordConst          {}
;

```

/* OptionalCount must appear before ByteList or an incorrect reduction will result */

```

OptionalCount
:          {$$ = TrCreateLeafNode (PARSEOP_ONES);} /* Placeholder is a OnesOp object */
| ','      {$$ = TrCreateLeafNode (PARSEOP_ONES);} /* Placeholder is a OnesOp object */
| ',' TermArg      {$$ = $2;}
;

```

```

BufferTerm
: PARSEOP_BUFFER '('      {$<n>$ = TrCreateLeafNode (PARSEOP_BUFFER);}
  OptionalTermArg
  ')' '{'
  BufferTermData '}'      {$$ = TrLinkChildren ($<n>3,2,$4,$7);}
| PARSEOP_BUFFER '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;

```

```

BufferTermData
: ByteList      {}

```

```

| StringData          {}
;

ByteList
:                    {$$ = NULL;}
| ByteConstExpr
| ByteList ','      /* Allows a trailing comma at list end */
| ByteList ' '
  ByteConstExpr     {$$ = TrLinkPeerNode ($1,$3);}
;

DataBufferTerm
: PARSEOP_DATABUFFER '('    {$<n>$ = TrCreateLeafNode (PARSEOP_DATABUFFER);}
  OptionalWordConst
  ')' '{
  ByteList '}'          {$$ = TrLinkChildren ($<n>3,2,$4,$7);}
| PARSEOP_DATABUFFER '('
  error ')'            {$$ = AslDoError(); yyclearin;}
;

DWordList
:                    {$$ = NULL;}
| DWordConstExpr
| DWordList ','     /* Allows a trailing comma at list end */
| DWordList ' '
  DWordConstExpr    {$$ = TrLinkPeerNode ($1,$3);}
;

PackageTerm
: PARSEOP_PACKAGE '('      {$<n>$ = TrCreateLeafNode (PARSEOP_VAR_PACKAGE);}
  VarPackageLengthTerm
  ')' '{
  PackageList '}'       {$$ = TrLinkChildren ($<n>3,2,$4,$7);}
| PARSEOP_PACKAGE '('
  error ')'            {$$ = AslDoError(); yyclearin;}
;

PackageList
:                    {$$ = NULL;}
| PackageElement
| PackageList ','    /* Allows a trailing comma at list end */
| PackageList ' '
  PackageElement     {$$ = TrLinkPeerNode ($1,$3);}
;

PackageElement
: DataObject         {}
| NameString         {}

```

```

;

VarPackageLengthTerm
:                               {$$ = TrCreateLeafNode (PARSEOP_DEFAULT_ARG);}
| TermArg                       {$$ = $1;}
;

/***** Macros *****/

EISAIDTerm
: PARSEOP_EISAID '('
  StringData ')'               {$$ = TrUpdateNode (PARSEOP_EISAID, $3);}
| PARSEOP_EISAID '('
  error ')'                     {$$ = AslDoError(); yyclearin;}
;

UnicodeTerm
: PARSEOP_UNICODE '('          {$<n>$ = TrCreateLeafNode (PARSEOP_UNICODE);}
  StringData
  ')'                           {$$ = TrLinkChildren ($<n>3,2,0,$4);}
| PARSEOP_UNICODE '('
  error ')'                     {$$ = AslDoError(); yyclearin;}
;

/***** Resources and Memory *****/

/*
* Note: Create two default nodes to allow conversion to a Buffer AML opcode
* Also, insert the EndTag at the end of the template.
*/

ResourceTemplateTerm
: PARSEOP_RESOURCETEMPLATE '(' ')'
  '{'
  ResourceMacroList ')'        {$$ = TrCreateNode (PARSEOP_RESOURCETEMPLATE,4,
    TrCreateLeafNode (PARSEOP_DEFAULT_ARG),
    TrCreateLeafNode (PARSEOP_DEFAULT_ARG),
    $5,
    TrCreateLeafNode (PARSEOP_ENDTAG));}
;

ResourceMacroList
:                               {$$ = NULL;}
| ResourceMacroList
  ResourceMacroTerm            {$$ = TrLinkPeerNode ($1,$2);}

```

;

ResourceMacroTerm

```
: DMATerm          {}
| DWordIOTerm      {}
| DWordMemoryTerm  {}
| DWordSpaceTerm   {}
| EndDependentFnTerm  {}
| ExtendedIOTerm    {}
| ExtendedMemoryTerm  {}
| ExtendedSpaceTerm  {}
| FixedDmaTerm      {}
| FixedIOTerm       {}
| GpioIntTerm       {}
| GpioIoTerm        {}
| I2cSerialBusTerm  {}
| InterruptTerm     {}
| IOTerm            {}
| IRQNoFlagsTerm    {}
| IRQTerm           {}
| Memory24Term      {}
| Memory32FixedTerm  {}
| Memory32Term      {}
| QWordIOTerm       {}
| QWordMemoryTerm   {}
| QWordSpaceTerm    {}
| RegisterTerm      {}
| SpiSerialBusTerm  {}
| StartDependentFnNoPriTerm  {}
| StartDependentFnTerm  {}
| UartSerialBusTerm  {}
| VendorLongTerm    {}
| VendorShortTerm   {}
| WordBusNumberTerm  {}
| WordIOTerm        {}
| WordSpaceTerm     {}
```

;

DMATerm

```
: PARSEOP_DMA '('      {$<n>$ = TrCreateLeafNode (PARSEOP_DMA);}
  DMATypeKeyword
  OptionalBusMasterKeyword
  ' XferTypeKeyword
  OptionalNameString_Last
  ')' '{
  ByteList '}'      {$$ = TrLinkChildren ($<n>3,5,$4,$5,$7,$8,$11);}
| PARSEOP_DMA '('
  error ')'      {$$ = AslDoError(); yyclearin;}
```

```

;

DWordIOTerm
: PARSEOP_DWORDIO '('      {<n>$ = TrCreateLeafNode (PARSEOP_DWORDIO);}
  OptionalResourceType_First
  OptionalMinType
  OptionalMaxType
  OptionalDecodeType
  OptionalRangeType
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  OptionalByteConstExpr
  OptionalStringData
  OptionalNameString
  OptionalType
  OptionalTranslationType_Last
  ')'          {$$ = TrLinkChildren
($<n>3,15,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$19,$20,$21,$22,$23);}
| PARSEOP_DWORDIO '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

```

DWordMemoryTerm
: PARSEOP_DWORDMEMORY '('   {<n>$ = TrCreateLeafNode (PARSEOP_DWORDMEMORY);}
  OptionalResourceType_First
  OptionalDecodeType
  OptionalMinType
  OptionalMaxType
  OptionalMemType
  ';' OptionalReadWriteKeyword
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  OptionalByteConstExpr
  OptionalStringData
  OptionalNameString
  OptionalAddressRange
  OptionalType_Last
  ')'          {$$ = TrLinkChildren
($<n>3,16,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$20,$21,$22,$23,$24,$25);}
| PARSEOP_DWORDMEMORY '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

DWordSpaceTerm

```
: PARSEOP_DWORDSPACE '('      {<n>$ = TrCreateLeafNode (PARSEOP_DWORDSPACE);}
  ByteConstExpr      {UtCheckIntegerRange ($4, 0xC0, 0xFF);}
  OptionalResourceType
  OptionalDecodeType
  OptionalMinType
  OptionalMaxType
  ';' ByteConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  ';' DWordConstExpr
  OptionalByteConstExpr
  OptionalStringData
  OptionalNameString_Last
  ')'      {$$ = TrLinkChildren (<n>3,14,$4,$6,$7,$8,$9,$11,$13,$15,$17,$19,$21,$22,$23,$24);}
| PARSEOP_DWORDSPACE '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;
```

EndDependentFnTerm

```
: PARSEOP_ENDDEPENDENTFN '('
  ')'      {$$ = TrCreateLeafNode (PARSEOP_ENDDEPENDENTFN);}
| PARSEOP_ENDDEPENDENTFN '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;
```

ExtendedIOTerm

```
: PARSEOP_EXTENDEDEDIO '('      {<n>$ = TrCreateLeafNode (PARSEOP_EXTENDEDEDIO);}
  OptionalResourceType_First
  OptionalMinType
  OptionalMaxType
  OptionalDecodeType
  OptionalRangeType
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  OptionalQWordConstExpr
  OptionalNameString
  OptionalType
  OptionalTranslationType_Last
  ')'      {$$ = TrLinkChildren (<n>3,14,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$19,$20,$21,$22);}
| PARSEOP_EXTENDEDEDIO '('
```

```
error ')'          {$$ = AslDoError(); yyclearin;}
;
```

ExtendedMemoryTerm

```
: PARSEOP_EXTENDEDMEMORY '('  {<n>$ = TrCreateLeafNode (PARSEOP_EXTENDEDMEMORY);}
  OptionalResourceType_First
  OptionalDecodeType
  OptionalMinType
  OptionalMaxType
  OptionalMemType
  ';' OptionalReadWriteKeyword
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  OptionalQWordConstExpr
  OptionalNameString
  OptionalAddressRange
  OptionalType_Last
  ')'          {$$ = TrLinkChildren
($<n>3,15,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$20,$21,$22,$23,$24);}
| PARSEOP_EXTENDEDMEMORY '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

ExtendedSpaceTerm

```
: PARSEOP_EXTENDEDSPACE '('  {<n>$ = TrCreateLeafNode (PARSEOP_EXTENDEDSPACE);}
  ByteConstExpr          {UtCheckIntegerRange ($4, 0xC0, 0xFF);}
  OptionalResourceType
  OptionalDecodeType
  OptionalMinType
  OptionalMaxType
  ';' ByteConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  ';' QWordConstExpr
  OptionalQWordConstExpr
  OptionalNameString_Last
  ')'          {$$ = TrLinkChildren ($<n>3,13,$4,$6,$7,$8,$9,$11,$13,$15,$17,$19,$21,$22,$23);}
| PARSEOP_EXTENDEDSPACE '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;
```

FixedDmaTerm

```
: PARSEOP_FIXEDDMA '('      {<n>$ = TrCreateLeafNode (PARSEOP_FIXEDDMA);}
```



```

WordConstExpr      // 04: DMA RequestLines
',' WordConstExpr  // 06: DMA Channels
OptionalXferSize   // 07: DMA TransferSize
OptionalNameString // 08: DescriptorName
')'                {$$ = TrLinkChildren ($<n>3,4,$4,$6,$7,$8);}
| PARSEOP_FIXEDDMA '('
  error ')'        {$$ = AslDoError(); yyclearin;}
;

```

FixedIOTerm

```

: PARSEOP_FIXEDIO '('      {$<n>$ = TrCreateLeafNode (PARSEOP_FIXEDIO);}
  WordConstExpr
  ',' ByteConstExpr
  OptionalNameString_Last
  ')'                    {$$ = TrLinkChildren ($<n>3,3,$4,$6,$7);}
| PARSEOP_FIXEDIO '('
  error ')'              {$$ = AslDoError(); yyclearin;}
;

```

GpioIntTerm

```

: PARSEOP_GPIO_INT '('    {$<n>$ = TrCreateLeafNode (PARSEOP_GPIO_INT);}
  InterruptTypeKeyword    // 04: InterruptType
  ',' InterruptLevel      // 06: InterruptLevel
  OptionalShareType       // 07: SharedType
  ',' PinConfigByte       // 09: PinConfig
  OptionalWordConstExpr   // 10: DebounceTimeout
  ',' StringData          // 12: ResourceSource
  OptionalByteConstExpr   // 13: ResourceSourceIndex
  OptionalResourceType    // 14: ResourceType
  OptionalNameString      // 15: DescriptorName
  OptionalBuffer_Last     // 16: VendorData
  ')' '{'
  DWordConstExpr ')'     {$$ = TrLinkChildren ($<n>3,11,$4,$6,$7,$9,$10,$12,$13,$14,$15,$16,$19);}
| PARSEOP_GPIO_INT '('
  error ')'              {$$ = AslDoError(); yyclearin;}
;

```

GpioIoTerm

```

: PARSEOP_GPIO_IO '('     {$<n>$ = TrCreateLeafNode (PARSEOP_GPIO_IO);}
  OptionalShareType_First // 04: SharedType
  ',' PinConfigByte       // 06: PinConfig
  OptionalWordConstExpr   // 07: DebounceTimeout
  OptionalWordConstExpr   // 08: DriveStrength
  OptionalIoRestriction   // 09: IoRestriction
  ',' StringData          // 11: ResourceSource
  OptionalByteConstExpr   // 12: ResourceSourceIndex
  OptionalResourceType    // 13: ResourceType
  OptionalNameString      // 14: DescriptorName

```

```

OptionalBuffer_Last // 15: VendorData
)'{'
    DWordList '}'    {$$ = TrLinkChildren ($<n>3,11,$4,$6,$7,$8,$9,$11,$12,$13,$14,$15,$18);}
| PARSEOP_GPIO_IO '('
    error ')'      {$$ = AslDoError(); yyclearin;}
;

```

I2cSerialBusTerm

```

: PARSEOP_I2C_SERIALBUS '('    {$<n>$ = TrCreateLeafNode (PARSEOP_I2C_SERIALBUS);}
    WordConstExpr // 04: SlaveAddress
    OptionalSlaveMode // 05: SlaveMode
    ',' DWordConstExpr // 07: ConnectionSpeed
    OptionalAddressingMode // 08: AddressingMode
    ',' StringData // 10: ResourceSource
    OptionalByteConstExpr // 11: ResourceSourceIndex
    OptionalResourceType // 12: ResourceType
    OptionalNameString // 13: DescriptorName
    OptionalBuffer_Last // 14: VendorData
    ')'          {$$ = TrLinkChildren ($<n>3,9,$4,$5,$7,$8,$10,$11,$12,$13,$14);}
| PARSEOP_I2C_SERIALBUS '('
    error ')'      {$$ = AslDoError(); yyclearin;}
;

```

InterruptTerm

```

: PARSEOP_INTERRUPT '('    {$<n>$ = TrCreateLeafNode (PARSEOP_INTERRUPT);}
    OptionalResourceType_First
    ',' InterruptTypeKeyword
    ',' InterruptLevel
    OptionalShareType
    OptionalByteConstExpr
    OptionalStringData
    OptionalNameString_Last
    ')'{'
    DWordList '}'    {$$ = TrLinkChildren ($<n>3,8,$4,$6,$8,$9,$10,$11,$12,$15);}
| PARSEOP_INTERRUPT '('
    error ')'      {$$ = AslDoError(); yyclearin;}
;

```

IOTerm

```

: PARSEOP_IO '('          {$<n>$ = TrCreateLeafNode (PARSEOP_IO);}
    IODecodeKeyword
    ',' WordConstExpr
    ',' WordConstExpr
    ',' ByteConstExpr
    ',' ByteConstExpr
    OptionalNameString_Last
    ')'          {$$ = TrLinkChildren ($<n>3,6,$4,$6,$8,$10,$12,$13);}
| PARSEOP_IO '('

```

```

    error ')'          {$$ = AslDoError(); yyclearin;}
;

IRQNoFlagsTerm
: PARSEOP_IRQNOFLAGS '('      {$<n>$ = TrCreateLeafNode (PARSEOP_IRQNOFLAGS);}
  OptionalNameString_First
  ')' '{'
    ByteList '}'          {$$ = TrLinkChildren ($<n>3,2,$4,$7);}
| PARSEOP_IRQNOFLAGS '('
  error ')'              {$$ = AslDoError(); yyclearin;}
;

IRQTerm
: PARSEOP_IRQ '('          {$<n>$ = TrCreateLeafNode (PARSEOP_IRQ);}
  InterruptTypeKeyword
  ',' InterruptLevel
  OptionalShareType
  OptionalNameString_Last
  ')' '{'
    ByteList '}'          {$$ = TrLinkChildren ($<n>3,5,$4,$6,$7,$8,$11);}
| PARSEOP_IRQ '('
  error ')'              {$$ = AslDoError(); yyclearin;}
;

Memory24Term
: PARSEOP_MEMORY24 '('     {$<n>$ = TrCreateLeafNode (PARSEOP_MEMORY24);}
  OptionalReadWriteKeyword
  ',' WordConstExpr
  ',' WordConstExpr
  ',' WordConstExpr
  ',' WordConstExpr
  OptionalNameString_Last
  ')'                      {$$ = TrLinkChildren ($<n>3,6,$4,$6,$8,$10,$12,$13);}
| PARSEOP_MEMORY24 '('
  error ')'                {$$ = AslDoError(); yyclearin;}
;

Memory32FixedTerm
: PARSEOP_MEMORY32FIXED '('  {$<n>$ = TrCreateLeafNode (PARSEOP_MEMORY32FIXED);}
  OptionalReadWriteKeyword
  ',' DWordConstExpr
  ',' DWordConstExpr
  OptionalNameString_Last
  ')'                      {$$ = TrLinkChildren ($<n>3,4,$4,$6,$8,$9);}
| PARSEOP_MEMORY32FIXED '('
  error ')'                {$$ = AslDoError(); yyclearin;}
;

```

Memory32Term

```
: PARSEOP_MEMORY32 '('      {$<n>$ = TrCreateLeafNode (PARSEOP_MEMORY32);}
  OptionalReadWriteKeyword
  ',' DWordConstExpr
  ',' DWordConstExpr
  ',' DWordConstExpr
  ',' DWordConstExpr
  OptionalNameString_Last
  ')'          {$$ = TrLinkChildren ($<n>3,6,$4,$6,$8,$10,$12,$13);}
| PARSEOP_MEMORY32 '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;
```

QWordIOTerm

```
: PARSEOP_QWORDIO '('      {$<n>$ = TrCreateLeafNode (PARSEOP_QWORDIO);}
  OptionalResourceType_First
  OptionalMinType
  OptionalMaxType
  OptionalDecodeType
  OptionalRangeType
  ',' QWordConstExpr
  ',' QWordConstExpr
  ',' QWordConstExpr
  ',' QWordConstExpr
  ',' QWordConstExpr
  OptionalByteConstExpr
  OptionalStringData
  OptionalNameString
  OptionalType
  OptionalTranslationType_Last
  ')'          {$$ = TrLinkChildren
($<n>3,15,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$19,$20,$21,$22,$23);}
| PARSEOP_QWORDIO '('
  error ')'    {$$ = AslDoError(); yyclearin;}
;
```

QWordMemoryTerm

```
: PARSEOP_QWORDMEMORY '('  {$<n>$ = TrCreateLeafNode (PARSEOP_QWORDMEMORY);}
  OptionalResourceType_First
  OptionalDecodeType
  OptionalMinType
  OptionalMaxType
  OptionalMemType
  ',' OptionalReadWriteKeyword
  ',' QWordConstExpr
  ',' QWordConstExpr
  ',' QWordConstExpr
  ',' QWordConstExpr
```

```

    ' QWordConstExpr
    OptionalByteConstExpr
    OptionalStringData
    OptionalNameString
    OptionalAddressRange
    OptionalType_Last
    ')'          {$$ = TrLinkChildren
($<n>3,16,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$20,$21,$22,$23,$24,$25);}
| PARSEOP_QWORDMEMORY '('
    error ')'          {$$ = AslDoError(); yyclearin;}
;

```

QWordSpaceTerm

```

: PARSEOP_QWORDSPACE '('      {$<n>$ = TrCreateLeafNode (PARSEOP_QWORDSPACE);}
    ByteConstExpr          {UtCheckIntegerRange ($4, 0xC0, 0xFF);}
    OptionalResourceType
    OptionalDecodeType
    OptionalMinType
    OptionalMaxType
    ' ByteConstExpr
    ' QWordConstExpr
    ' QWordConstExpr
    ' QWordConstExpr
    ' QWordConstExpr
    ' QWordConstExpr
    ' QWordConstExpr
    OptionalByteConstExpr
    OptionalStringData
    OptionalNameString_Last
    ')'          {$$ = TrLinkChildren ($<n>3,14,$4,$6,$7,$8,$9,$11,$13,$15,$17,$19,$21,$22,$23,$24);}
| PARSEOP_QWORDSPACE '('
    error ')'          {$$ = AslDoError(); yyclearin;}
;

```

RegisterTerm

```

: PARSEOP_REGISTER '('      {$<n>$ = TrCreateLeafNode (PARSEOP_REGISTER);}
    AddressSpaceKeyword
    ' ByteConstExpr
    ' ByteConstExpr
    ' QWordConstExpr
    OptionalAccessSize
    OptionalNameString_Last
    ')'          {$$ = TrLinkChildren ($<n>3,6,$4,$6,$8,$10,$11,$12);}
| PARSEOP_REGISTER '('
    error ')'          {$$ = AslDoError(); yyclearin;}
;

```

SpiSerialBusTerm

```

: PARSEOP_SPI_SERIALBUS '('      {$<n>$ = TrCreateLeafNode (PARSEOP_SPI_SERIALBUS);}

```

```

WordConstExpr      // 04: DeviceSelection
OptionalDevicePolarity // 05: DevicePolarity
OptionalWireMode    // 06: WireMode
',' ByteConstExpr   // 08: DataBitLength
OptionalSlaveMode   // 09: SlaveMode
',' DWordConstExpr // 11: ConnectionSpeed
',' ClockPolarityKeyword // 13: ClockPolarity
',' ClockPhaseKeyword // 15: ClockPhase
',' StringData      // 17: ResourceSource
OptionalByteConstExpr // 18: ResourceSourceIndex
OptionalResourceType // 19: ResourceType
OptionalNameString   // 20: DescriptorName
OptionalBuffer_Last  // 21: VendorData
')'                  {$$ = TrLinkChildren ($<n>3,13,$4,$5,$6,$8,$9,$11,$13,$15,$17,$18,$19,$20,$21);}
| PARSEOP_SPI_SERIALBUS '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

StartDependentFnNoPriTerm

```

: PARSEOP_STARTDEPENDENTFN_NOPRI '(' {$<n>$ = TrCreateLeafNode
(PARSEOP_STARTDEPENDENTFN_NOPRI);}
)'{'
  ResourceMacroList ')' {$$ = TrLinkChildren ($<n>3,1,$6);}
| PARSEOP_STARTDEPENDENTFN_NOPRI '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

StartDependentFnTerm

```

: PARSEOP_STARTDEPENDENTFN '(' {$<n>$ = TrCreateLeafNode (PARSEOP_STARTDEPENDENTFN);}
  ByteConstExpr
  ',' ByteConstExpr
  ')' '{'
  ResourceMacroList ')' {$$ = TrLinkChildren ($<n>3,3,$4,$6,$9);}
| PARSEOP_STARTDEPENDENTFN '('
  error ')'          {$$ = AslDoError(); yyclearin;}
;

```

UartSerialBusTerm

```

: PARSEOP_UART_SERIALBUS '(' {$<n>$ = TrCreateLeafNode (PARSEOP_UART_SERIALBUS);}
  DWordConstExpr      // 04: ConnectionSpeed
  OptionalBitsPerByte // 05: BitsPerByte
  OptionalStopBits    // 06: StopBits
  ',' ByteConstExpr   // 08: LinesInUse
  OptionalEndian      // 09: Endianess
  OptionalParityType  // 10: Parity
  OptionalFlowControl // 11: FlowControl
  ',' WordConstExpr   // 13: Rx BufferSize
  ',' WordConstExpr   // 15: Tx BufferSize

```

```

'| StringData // 17: ResourceSource
OptionalByteConstExpr // 18: ResourceSourceIndex
OptionalResourceType // 19: ResourceType
OptionalNameString // 20: DescriptorName
OptionalBuffer_Last // 21: VendorData
')' {$$ = TrLinkChildren ($<n>3,14,$4,$5,$6,$8,$9,$10,$11,$13,$15,$17,$18,$19,$20,$21);}
| PARSEOP_UART_SERIALBUS '('
error ')' {$$ = AslDoError(); yyclearin;}
;

```

VendorLongTerm

```

: PARSEOP_VENDORLONG '(' {$<n>$ = TrCreateLeafNode (PARSEOP_VENDORLONG);}
OptionalNameString_First
)'{'
ByteList '}' {$$ = TrLinkChildren ($<n>3,2,$4,$7);}
| PARSEOP_VENDORLONG '('
error ')' {$$ = AslDoError(); yyclearin;}
;

```

VendorShortTerm

```

: PARSEOP_VENDORSHORT '(' {$<n>$ = TrCreateLeafNode (PARSEOP_VENDORSHORT);}
OptionalNameString_First
)'{'
ByteList '}' {$$ = TrLinkChildren ($<n>3,2,$4,$7);}
| PARSEOP_VENDORSHORT '('
error ')' {$$ = AslDoError(); yyclearin;}
;

```

WordBusNumberTerm

```

: PARSEOP_WORDBUSNUMBER '(' {$<n>$ = TrCreateLeafNode (PARSEOP_WORDBUSNUMBER);}
OptionalResourceType_First
OptionalMinType
OptionalMaxType
OptionalDecodeType
'| WordConstExpr
'| WordConstExpr
'| WordConstExpr
'| WordConstExpr
'| WordConstExpr
OptionalByteConstExpr
OptionalStringData
OptionalNameString_Last
)' {$$ = TrLinkChildren ($<n>3,12,$4,$5,$6,$7,$9,$11,$13,$15,$17,$18,$19,$20);}
| PARSEOP_WORDBUSNUMBER '('
error ')' {$$ = AslDoError(); yyclearin;}
;

```

WordIOTerm

```

: PARSEOP_WORDIO '('      {<n>$ = TrCreateLeafNode (PARSEOP_WORDIO);}
  OptionalResourceType_First
  OptionalMinType
  OptionalMaxType
  OptionalDecodeType
  OptionalRangeType
  ';' WordConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  OptionalByteConstExpr
  OptionalStringData
  OptionalNameString
  OptionalType
  OptionalTranslationType_Last
  ')'          {$$ = TrLinkChildren
($<n>3,15,$4,$5,$6,$7,$8,$10,$12,$14,$16,$18,$19,$20,$21,$22,$23);}
| PARSEOP_WORDIO '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;

```

WordSpaceTerm

```

: PARSEOP_WORDSAPCE '('      {<n>$ = TrCreateLeafNode (PARSEOP_WORDSAPCE);}
  ByteConstExpr      {UtCheckIntegerRange ($4, 0xC0, 0xFF);}
  OptionalResourceType
  OptionalDecodeType
  OptionalMinType
  OptionalMaxType
  ';' ByteConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  ';' WordConstExpr
  OptionalByteConstExpr
  OptionalStringData
  OptionalNameString_Last
  ')'          {$$ = TrLinkChildren ($<n>3,14,$4,$6,$7,$8,$9,$11,$13,$15,$17,$19,$21,$22,$23,$24);}
| PARSEOP_WORDSAPCE '('
  error ')'      {$$ = AslDoError(); yyclearin;}
;

```

/* Object References */

/* Allow IO, DMA, IRQ Resource macro names to also be used as identifiers */


```

NameString
: NameSeg          {}
| PARSEOP_NAMESTRING    {$$ = TrCreateValuedLeafNode (PARSEOP_NAMESTRING,
(ACPI_NATIVE_INT) AslCompilerIval.s);}
| PARSEOP_IO            {$$ = TrCreateValuedLeafNode (PARSEOP_NAMESTRING,
(ACPI_NATIVE_INT) "IO");}
| PARSEOP_DMA           {$$ = TrCreateValuedLeafNode (PARSEOP_NAMESTRING,
(ACPI_NATIVE_INT) "DMA");}
| PARSEOP_IRQ           {$$ = TrCreateValuedLeafNode (PARSEOP_NAMESTRING,
(ACPI_NATIVE_INT) "IRQ");}
;

```

```

NameSeg
: PARSEOP_NAMESEG      {$$ = TrCreateValuedLeafNode (PARSEOP_NAMESEG,
(ACPI_NATIVE_INT) AslCompilerIval.s);}
;

```

/****** Helper rules *****/

```

AmlPackageLengthTerm
: Integer              {$$ = TrUpdateNode (PARSEOP_PACKAGE_LENGTH,(ACPI_PARSE_OBJECT *)
$1);}
;

```

```

NameStringItem
: ',' NameString       {$$ = $2;}
| ',' error            {$$ = AslDoError (); yyclearin;}
;

```

```

TermArgItem
: ',' TermArg          {$$ = $2;}
| ',' error            {$$ = AslDoError (); yyclearin;}
;

```

```

OptionalBusMasterKeyword
: ','                  {$$ = TrCreateLeafNode (PARSEOP_BUSMASTERTYPE_MASTER);}
| ',' PARSEOP_BUSMASTERTYPE_MASTER    {$$ = TrCreateLeafNode
(PARSEOP_BUSMASTERTYPE_MASTER);}
| ',' PARSEOP_BUSMASTERTYPE_NOTMASTER  {$$ = TrCreateLeafNode
(PARSEOP_BUSMASTERTYPE_NOTMASTER);}
;

```

```

OptionalAccessAttribTerm
:                      {$$ = NULL;}
| ','                  {$$ = NULL;}
| ',' ByteConstExpr    {$$ = $2;}

```

```
|',' AccessAttribKeyword    {$$ = $2;}  
;
```

OptionalAccessSize

```
:                {$$ = TrCreateValuedLeafNode (PARSEOP_BYTECONST, 0);}  
|','             {$$ = TrCreateValuedLeafNode (PARSEOP_BYTECONST, 0);}  
|',' ByteConstExpr    {$$ = $2;}  
;
```

OptionalAddressingMode

```
:','            {$$ = NULL;}  
|',' AddressingModeKeyword    {$$ = $2;}  
;
```

OptionalAddressRange

```
:                {$$ = NULL;}  
|','            {$$ = NULL;}  
|',' AddressKeyword    {$$ = $2;}  
;
```

OptionalBitsPerByte

```
:','            {$$ = NULL;}  
|',' BitsPerByteKeyword    {$$ = $2;}  
;
```

OptionalBuffer_Last

```
:                {$$ = NULL;}  
|','            {$$ = NULL;}  
|',' DataBufferTerm    {$$ = $2;}  
;
```

OptionalByteConstExpr

```
:                {$$ = NULL;}  
|','            {$$ = NULL;}  
|',' ByteConstExpr    {$$ = $2;}  
;
```

OptionalDecodeType

```
:','            {$$ = NULL;}  
|',' DecodeKeyword    {$$ = $2;}  
;
```

OptionalDevicePolarity

```
:','            {$$ = NULL;}  
|',' DevicePolarityKeyword    {$$ = $2;}  
;
```

OptionalDWordConstExpr

```
:          {$$ = NULL;}
| ','      {$$ = NULL;}
| ',' DWordConstExpr    {$$ = $2;}
;
```

OptionalEndian

```
: ','      {$$ = NULL;}
| ',' EndianKeyword     {$$ = $2;}
;
```

OptionalFlowControl

```
: ','      {$$ = NULL;}
| ',' FlowControlKeyword {$$ = $2;}
;
```

OptionalIoRestriction

```
: ','      {$$ = NULL;}
| ',' IoRestrictionKeyword {$$ = $2;}
;
```

OptionalListString

```
:          {$$ = TrCreateValuedLeafNode (PARSEOP_STRING_LITERAL, ACPI_TO_INTEGER
(""));} /* Placeholder is a NULL string */
| ','      {$$ = TrCreateValuedLeafNode (PARSEOP_STRING_LITERAL, ACPI_TO_INTEGER
(""));} /* Placeholder is a NULL string */
| ',' TermArg      {$$ = $2;}
;
```

OptionalMaxType

```
: ','      {$$ = NULL;}
| ',' MaxKeyword     {$$ = $2;}
;
```

OptionalMemType

```
: ','      {$$ = NULL;}
| ',' MemTypeKeyword {$$ = $2;}
;
```

OptionalMinType

```
: ','      {$$ = NULL;}
| ',' MinKeyword     {$$ = $2;}
;
```

OptionalNameString

```
:          {$$ = NULL;}
| ','      {$$ = NULL;}
| ',' NameString      {$$ = $2;}
;
```

OptionalNameString_Last

```
:                {$$ = NULL;}
| ','            {$$ = NULL;}
| ',' NameString {$$ = $2;}
;
```

OptionalNameString_First

```
:                {$$ = TrCreateLeafNode (PARSEOP_ZERO);}
| NameString     {$$ = $1;}
;
```

OptionalObjectTypeKeyword

```
:                {$$ = TrCreateLeafNode (PARSEOP_OBJECTTYPE_UNK);}
| ',' ObjectTypeKeyword {$$ = $2;}
;
```

OptionalParityType

```
: ','           {$$ = NULL;}
| ',' ParityTypeKeyword {$$ = $2;}
;
```

OptionalQWordConstExpr

```
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' QWordConstExpr {$$ = $2;}
;
```

OptionalRangeType

```
: ','           {$$ = NULL;}
| ',' RangeTypeKeyword {$$ = $2;}
;
```

OptionalReadWriteKeyword

```
:                {$$ = TrCreateLeafNode (PARSEOP_READWRITETYPE_BOTH);}
| PARSEOP_READWRITETYPE_BOTH {$$ = TrCreateLeafNode
(PARSEOP_READWRITETYPE_BOTH);}
| PARSEOP_READWRITETYPE_READONLY {$$ = TrCreateLeafNode
(PARSEOP_READWRITETYPE_READONLY);}
;
```

OptionalReference

```
:                {$$ = TrCreateLeafNode (PARSEOP_ZERO);} /* Placeholder is a ZeroOp object */
| ','           {$$ = TrCreateLeafNode (PARSEOP_ZERO);} /* Placeholder is a ZeroOp object */
| ',' TermArg     {$$ = $2;}
;
```

OptionalResourceType_First

```

:                {$$ = TrCreateLeafNode (PARSEOP_RESOURCECTYPE_CONSUMER);}
| ResourceTypeKeyword    {$$ = $1;}
;

OptionalResourceType
:                {$$ = TrCreateLeafNode (PARSEOP_RESOURCECTYPE_CONSUMER);}
| ','           {$$ = TrCreateLeafNode (PARSEOP_RESOURCECTYPE_CONSUMER);}
| ',' ResourceTypeKeyword    {$$ = $2;}
;

OptionalReturnArg
:                {$$ = TrSetNodeFlags (TrCreateLeafNode (PARSEOP_ZERO),
NODE_IS_NULL_RETURN);} /* Placeholder is a ZeroOp object */
| TermArg        {$$ = $1;}
;

OptionalSerializeRuleKeyword
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' SerializeRuleKeyword    {$$ = $2;}
;

OptionalSlaveMode
: ':'           {$$ = NULL;}
| ',' SlaveModeKeyword    {$$ = $2;}
;

OptionalShareType
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' ShareTypeKeyword    {$$ = $2;}
;

OptionalShareType_First
:                {$$ = NULL;}
| ShareTypeKeyword    {$$ = $1;}
;

OptionalStopBits
: ':'           {$$ = NULL;}
| ',' StopBitsKeyword    {$$ = $2;}
;

OptionalStringData
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' StringData    {$$ = $2;}
;

```

OptionalTermArg

```
:                {$$ = NULL;}
| TermArg        {$$ = $1;}
;
```

OptionalType

```
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' TypeKeyword {$$ = $2;}
;
```

OptionalType_Last

```
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' TypeKeyword {$$ = $2;}
;
```

OptionalTranslationType_Last

```
:                {$$ = NULL;}
| ','           {$$ = NULL;}
| ',' TranslationKeyword {$$ = $2;}
;
```

OptionalWireMode

```
: ','           {$$ = NULL;}
| ',' WireModeKeyword {$$ = $2;}
;
```

OptionalWordConst

```
:                {$$ = NULL;}
| WordConst      {$$ = $1;}
;
```

OptionalWordConstExpr

```
: ','           {$$ = NULL;}
| ',' WordConstExpr {$$ = $2;}
;
```

OptionalXferSize

```
:                {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_32, 2);}
| ','           {$$ = TrCreateValuedLeafNode (PARSEOP_XFERSIZE_32, 2);}
| ',' XferSizeKeyword {$$ = $2;}
;
```

%%

/******

*

```

* Local support functions
*
*****/

int
AslCompilerwrap(void)
{
    return 1;
}

/*! [End] no source code translation !*/

void *
AslLocalAllocate (unsigned int Size)
{
    void *Mem;

    DbgPrint (ASL_PARSE_OUTPUT, "\nAslLocalAllocate: Expanding Stack to %u\n\n", Size);

    Mem = ACPI_ALLOCATE_ZEROED (Size);
    if (!Mem)
    {
        AslCommonError (ASL_ERROR, ASL_MSG_MEMORY_ALLOCATION,
            Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
            Gbl_InputByteCount, Gbl_CurrentColumn,
            Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
        exit (1);
    }

    return (Mem);
}

ACPI_PARSE_OBJECT *
AslDoError (void)
{
    return (TrCreateLeafNode (PARSEOP_ERRORNODE));
}

/*****
*
* FUNCTION:  UtGetOpName
*
* PARAMETERS: ParseOpcode      - Parser keyword ID

```

```

*
* RETURN:   Pointer to the opcode name
*
* DESCRIPTION: Get the ascii name of the parse opcode
*
*****/

```

```

char *
UtGetOpName (
    UINT32      ParseOpcode)
{
#ifdef ASL_YYTNAME_START
    /*
     * First entries (ASL_YYTNAME_START) in yytname are special reserved names.
     * Ignore first 8 characters of the name
     */
    return ((char *) yytname
        [(ParseOpcode - ASL_FIRST_PARSE_OPCODE) + ASL_YYTNAME_START] + 8);
#else
    return ("[Unknown parser generator]");
#endif
}

```

Found in path(s):

```

* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-
20120111/compiler/aslcompiler.y

```

No license file was found, but licenses were detected in source scan.

11 January 2012. Summary of changes for version 20120111:

This release is available at www.acpica.org/downloads.

The ACPI 5.0 specification is available at www.acpi.info.

1) ACPICA Core Subsystem:

Implemented a new mechanism to allow host device drivers to check for address range conflicts with ACPI Operation Regions. Both SystemMemory and SystemIO address spaces are supported. A new external interface, AcpiCheckAddressRange, allows drivers to check an address range against the ACPI namespace. See the ACPICA reference for additional details. Adds one new file, utilities/utaddress.c. Lin Ming, Bob Moore.

Fixed several issues with the ACPI 5.0 FADT support: Add the sleep Control and Status registers, update the ACPI 5.0 flags, and update internal data structures to handle an FADT larger than 256 bytes. The size of the ACPI 5.0 FADT is 268 bytes.

Updated all ACPIA copyrights and signons to 2012. Added the 2012 copyright to all module headers and signons, including the standard Linux header. This affects virtually every file in the ACPIA core subsystem, iASL compiler, and all ACPIA utilities.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 92.3K Code, 24.9K Data, 117.2K Total

Debug Version: 170.8K Code, 72.6K Data, 243.4K Total

Current Release:

Non-Debug Version: 92.8K Code, 24.9K Data, 117.7K Total

Debug Version: 171.7K Code, 72.9K Data, 244.5K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: fixed a problem with the automatic resource tag generation support. Fixes a problem where the resource tags are inadvertently not constructed if the table being disassembled contains external references to control methods. Moved the actual construction of the tags to after the final namespace is constructed (after 2nd parse is invoked due to external control method references.) ACPIA BZ 941.

Table Compiler: Make all "generic" operators caseless. These are the operators like `UINT8`, `String`, etc. Making these caseless improves ease-of-use. ACPIA BZ 934.

23 November 2011. Summary of changes for version 20111123:

0) ACPI 5.0 Support:

This release contains full support for the ACPI 5.0 specification, as summarized below.

Reduced Hardware Support:

This support allows for ACPI systems without the usual ACPI hardware. This support is enabled by a flag in the revision 5 FADT. If it is set, ACPIA will not attempt to initialize or use any of the usual ACPI hardware. Note, when this flag is set, all of the following ACPI hardware is assumed to be not present and is not initialized or accessed:

General Purpose Events (GPEs)
Fixed Events (PM1a/PM1b and PM Control)
Power Management Timer and Console Buttons (power/sleep)
Real-time Clock Alarm
Global Lock
System Control Interrupt (SCI)
The FACS is assumed to be non-existent

ACPI Tables:

All new tables and updates to existing tables are fully supported in the ACPICA headers (for use by device drivers), the disassembler, and the iASL Data Table Compiler. ACPI 5.0 defines these new tables:

BGRT /* Boot Graphics Resource Table */
DRTM /* Dynamic Root of Trust for Measurement table */
FPDT /* Firmware Performance Data Table */
GTDT /* Generic Timer Description Table */
MPST /* Memory Power State Table */
PCCT /* Platform Communications Channel Table */
PMTT /* Platform Memory Topology Table */
RASf /* RAS Feature table */

Operation Regions/SpaceIDs:

All new operation regions are fully supported by the iASL compiler, the disassembler, and the ACPICA runtime code (for dispatch to region handlers.)
The new operation region Space IDs are:

GeneralPurposeIo
GenericSerialBus

Resource Descriptors:

All new ASL resource descriptors are fully supported by the iASL compiler, the ASL/AML disassembler, and the ACPICA runtime Resource Manager code (including all new predefined resource tags). New descriptors are:

FixedDma
GpioIo
GpioInt
I2cSerialBus
SpiSerialBus
UartSerialBus

ASL/AML Operators, New and Modified:

One new operator is added, the Connection operator, which is used to associate a GeneralPurposeIo or GenericSerialBus resource descriptor with individual field objects within an operation region. Several new protocols are associated with the AccessAs operator. All are fully supported by the iASL compiler, disassembler, and runtime ACPICA AML interpreter:

```
Connection          // Declare Field Connection attributes
AccessAs: AttribBytes (n)    // Read/Write N-Bytes Protocol
AccessAs: AttribRawBytes (n) // Raw Read/Write N-Bytes Protocol
AccessAs: AttribRawProcessBytes (n) // Raw Process Call Protocol
RawDataBuffer        // Data type for Vendor Data fields
```

Predefined ASL/AML Objects:

All new predefined objects/control-methods are supported by the iASL compiler and the ACPICA runtime validation/repair (arguments and return values.) New predefined names include the following:

Standard Predefined Names (Objects or Control Methods):

```
_AEI, _CLS, _CPC, _CWS, _DEP,
_DLM, _EVT, _GCP, _CRT, _GWS,
_HRV, _PRE, _PSE, _SRT, _SUB.
```

Resource Tags (Names used to access individual fields within resource descriptors):

```
_DBT, _DPL, _DRS, _END, _FLC,
_IOR, _LIN, _MOD, _PAR, _PHA,
_PIN, _PPI, _POL, _RXL, _SLV,
_SPE, _STB, _TXL, _VEN.
```

ACPICA External Interfaces:

Several new interfaces have been defined for use by ACPI-related device drivers and other host OS services:

AcpiAcquireMutex and AcpiReleaseMutex: These interfaces allow the host OS to acquire and release AML mutexes that are defined in the DSDT/SSDT tables provided by the BIOS. They are intended to be used in conjunction with the ACPI 5.0 _DLM (Device Lock Method) in order to provide transaction-level mutual exclusion with the AML code/interpreter.

AcpiGetEventResources: Returns the (formatted) resource descriptors as defined by the ACPI 5.0 _AEI object (ACPI Event Information). This object provides

resource descriptors associated with hardware-reduced platform events, similar to the AcpiGetCurrentResources interface.

Operation Region Handlers: For General Purpose IO and Generic Serial Bus operation regions, information about the Connection() object and any optional length information is passed to the region handler within the Context parameter.

AcpiBufferToResource: This interface converts a raw AML buffer containing a resource template or resource descriptor to the ACPI_RESOURCE internal format suitable for use by device drivers. Can be used by an operation region handler to convert the Connection() buffer object into a ACPI_RESOURCE.

Miscellaneous/Tools/TestSuites:

Support for extended _HID names (Four alpha characters instead of three).

Support for ACPI 5.0 features in the AcpiExec and AcpiHelp utilities.

Support for ACPI 5.0 features in the ASLTS test suite.

Fully updated documentation (ACPICA and iASL reference documents.)

ACPI Table Definition Language:

Support for this language was implemented and released as a subsystem of the iASL compiler in 2010. (See the iASL compiler User Guide.)

Non-ACPI 5.0 changes for this release:

1) ACPICA Core Subsystem:

Fix a problem with operation region declarations where a failure can occur if the region name and an argument that evaluates to an object (such as the region address) are in different namespace scopes. Lin Ming, ACPICA BZ 937.

Do not abort an ACPI table load if an invalid space ID is found within. This will be caught later if the offending method is executed. ACPICA BZ 925.

Fixed an issue with the FFixedHW space ID where the ID was not always recognized properly (Both ACPICA and iASL). ACPICA BZ 926.

Fixed a problem with the 32-bit generation of the unix-specific OSL (osunixxf.c). Lin Ming, ACPICA BZ 936.

Several changes made to enable generation with the GCC 4.6 compiler. ACPICA BZ 935.

New error messages: Unsupported I/O requests (not 8/16/32 bit), and Index/Bank field registers out-of-range.

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented the `__PATH__` operator, which returns the full pathname of the current source file.

AcpiHelp: Automatically display expanded keyword information for all ASL operators.

Debugger: Add "Template" command to disassemble/dump resource template buffers.

Added a new master script to generate and execute the ASLTS test suite. Automatically handles 32- and 64-bit generation. See `tests/aslts.sh`

iASL: Fix problem with listing generation during processing of the `Switch()` operator where AML listing was disabled until the entire `Switch` block was completed.

iASL: Improve support for semicolon statement terminators. Fix "invalid character" message for some cases when the semicolon is used. Semicolons are now allowed after every `<Term>` grammar element. ACPICA BZ 927.

iASL: Fixed some possible aliasing warnings during generation. ACPICA BZ 923.

Disassembler: Fix problem with disassembly of the `DataTableRegion` operator where an inadvertent "Unhandled deferred opcode" message could be generated.

3) Example Code and Data Size

These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 90.2K Code, 23.9K Data, 114.1K Total

Debug Version: 165.6K Code, 68.4K Data, 234.0K Total

Current Release:

Non-Debug Version: 92.3K Code, 24.9K Data, 117.2K Total

Debug Version: 170.8K Code, 72.6K Data, 243.4K Total

22 September 2011. Summary of changes for version 20110922:

0) ACPI 5.0 News:

Support for ACPI 5.0 in ACPICA has been underway for several months and will be released at the same time that ACPI 5.0 is officially released.

The ACPI 5.0 specification is on track for release in the next few months.

1) ACPICA Core Subsystem:

Fixed a problem where the maximum sleep time for the Sleep() operator was intended to be limited to two seconds, but was inadvertently limited to 20 seconds instead.

Linux and Unix makefiles: Added header file dependencies to ensure correct generation of ACPICA core code and utilities. Also simplified the makefiles considerably through the use of the vpath variable to specify search paths. ACPICA BZ 924.

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented support to check the access length for all fields created to access named Resource Descriptor fields. For example, if a resource field is defined to be two bits, a warning is issued if a CreateXxxxField() is used with an incorrect bit length. This is implemented for all current resource descriptor names. ACPICA BZ 930.

Disassembler: Fixed a byte ordering problem with the output of 24-bit and 56-bit integers.

iASL: Fixed a couple of issues associated with variable-length package objects. 1) properly handle constants like One, Ones, Zero -- do not make a VAR_PACKAGE when these are used as a package length. 2) Allow the VAR_PACKAGE opcode (in addition to PACKAGE) when validating object types for predefined names.

iASL: Emit statistics for all output files (instead of just the ASL input and AML output). Includes listings, hex files, etc.

iASL: Added -G option to the table compiler to allow the compilation of custom ACPI tables. The only part of a table that is required is the standard 36-byte ACPI header.

AcpiXtract: Ported to the standard ACPICA environment (with ACPICA headers), which also adds correct 64-bit support. Also, now all output filenames are completely lower case.

AcpiExec: Ignore any non-AML tables (tables other than DSDT or SSDT) when loading table files. A warning is issued for any such tables. The only

exception is an FADT. This also fixes a possible fault when attempting to load non-AML tables. ACPICA BZ 932.

AcpiHelp: Added the AccessAs and Offset operators. Fixed a problem where a missing table terminator could cause a fault when using the -p option.

AcpiSrc: Fixed a possible divide-by-zero fault when generating file statistics.

3) Example Code and Data Size

These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 9.0):

Non-Debug Version: 90.2K Code, 23.9K Data, 114.1K Total

Debug Version: 165.6K Code, 68.4K Data, 234.0K Total

Current Release (VC 9.0):

Non-Debug Version: 90.2K Code, 23.9K Data, 114.1K Total

Debug Version: 165.6K Code, 68.4K Data, 234.0K Total

23 June 2011. Summary of changes for version 20110623:

1) ACPI CA Core Subsystem:

Updated the predefined name repair mechanism to not attempt repair of a _TSS return object if a _PSS object is present. We can only sort the _TSS return package if there is no _PSS within the same scope. This is because if _PSS is present, the ACPI specification dictates that the _TSS Power Dissipation field is to be ignored, and therefore some BIOSs leave garbage values in the _TSS Power field(s). In this case, it is best to just return the _TSS package as-is. Reported by, and fixed with assistance from Fenghua Yu.

Added an option to globally disable the control method return value validation and repair. This runtime option can be used to disable return value repair if this is causing a problem on a particular machine. Also added an option to AcpiExec (-dr) to set this disable flag.

All makefiles and project files: Major changes to improve generation of ACPICA tools. ACPICA BZ 912:

Reduce default optimization levels to improve compatibility

For Linux, add strict-aliasing=0 for gcc 4

Cleanup and simplify use of command line defines

Cleanup multithread library support

Improve usage messages

Linux-specific header: update handling of `THREAD_ID` and `pthread`. For the 32-bit case, improve casting to eliminate possible warnings, especially with the `acpica` tools.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 9.0):

Non-Debug Version: 90.1K Code, 23.9K Data, 114.0K Total

Debug Version: 165.6K Code, 68.4K Data, 234.0K Total

Current Release (VC 9.0):

Non-Debug Version: 90.2K Code, 23.9K Data, 114.1K Total

Debug Version: 165.6K Code, 68.4K Data, 234.0K Total

2) iASL Compiler/Disassembler and Tools:

With this release, a new utility named "acpihelp" has been added to the `ACPICA` package. This utility summarizes the ACPI specification chapters for the ASL and AML languages. It generates under Linux/Unix as well as Windows, and provides the following functionality:

Find/display ASL operator(s) -- with description and syntax.

Find/display ASL keyword(s) -- with exact spelling and descriptions.

Find/display ACPI predefined name(s) -- with description, number of arguments, and the return value data type.

Find/display AML opcode name(s) -- with opcode, arguments, and grammar.

Decode/display AML opcode -- with opcode name, arguments, and grammar.

Service Layers: Make multi-thread support configurable. Conditionally compile the multi-thread support so that threading libraries will not be linked if not necessary. The only tool that requires multi-thread support is `AcpiExec`.

iASL: Update `yyerror/AslCompilerError` for "const" errors. Newer versions of Bison appear to want the interface to `yyerror` to be a `const char *` (or at least this is a problem when generating iASL on some systems.) `ACPICA BZ 923` Pierre Lejeune.

Tools: Fix for systems where `O_BINARY` is not defined. Only used for Windows versions of the tools.

27 May 2011. Summary of changes for version 20110527:

1) ACPI CA Core Subsystem:

ASL Load() operator: Reinstate most restrictions on the incoming ACPI table signature. Now, only allow SSDT, OEMx, and a null signature. History:

- 1) Originally, we checked the table signature for "SSDT" or "PSDT". (PSDT is now obsolete.)
- 2) We added support for OEMx tables, signature "OEM" plus a fourth "don't care" character.
- 3) Valid tables were encountered with a null signature, so we just gave up on validating the signature, (05/2008).
- 4) We encountered non-AML tables such as the MADT, which caused interpreter errors and kernel faults. So now, we once again allow only SSDT, OEMx, and now, also a null signature. (05/2011).

Added the missing _TDL predefined name to the global name list in order to enable validation. Affects both the core ACPICA code and the iASL compiler.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 9.0):

Non-Debug Version: 90.0K Code, 23.8K Data, 113.8K Total

Debug Version: 164.5K Code, 68.0K Data, 232.5K Total

Current Release (VC 9.0):

Non-Debug Version: 90.1K Code, 23.9K Data, 114.0K Total

Debug Version: 165.6K Code, 68.4K Data, 234.0K Total

2) iASL Compiler/Disassembler and Tools:

Debugger/AcpiExec: Implemented support for "complex" method arguments on the debugger command line. This adds support beyond simple integers -- including Strings, Buffers, and Packages. Includes support for nested packages.

Increased the default command line buffer size to accommodate these arguments.

See the ACPICA reference for details and syntax. ACPICA BZ 917.

Debugger/AcpiExec: Implemented support for "default" method arguments for the Execute/Debug command. Now, the debugger will always invoke a control method with the required number of arguments -- even if the command line specifies none or insufficient arguments. It uses default integer values for any missing arguments. Also fixes a bug where only six method arguments maximum were supported instead of the required seven.

Debugger/AcpiExec: Add a maximum buffer length parameter to AcpiOsGetLine and also return status in order to prevent buffer overruns. See the ACPICA reference for details and syntax. ACPICA BZ 921

iASL: Cleaned up support for Berkeley yacc. A general cleanup of code and makefiles to simplify support for the two different but similar parser

generators, bison and yacc.

Updated the generic unix makefile for gcc 4. The default gcc version is now expected to be 4 or greater, since options specific to gcc 4 are used.

13 April 2011. Summary of changes for version 20110413:

1) ACPI CA Core Subsystem:

Implemented support to execute a so-called "orphan" _REG method under the EC device. This change will force the execution of a _REG method underneath the EC

device even if there is no corresponding operation region of type EmbeddedControl. Fixes a problem seen on some machines and apparently is compatible with Windows behavior. ACPICA BZ 875.

Added more predefined methods that are eligible for automatic NULL package element removal. This change adds another group of predefined names to the list of names that can be repaired by having NULL package elements dynamically removed. This group are those methods that return a single variable-length package containing simple data types such as integers, buffers, strings. This includes: _ALx, _BCL, _CID, _DOD, _EDL, _FIX, _PCL, _PLD, _PMD, _PRx, _PSL, _Sx, and _TZD. ACPICA BZ 914.

Split and segregated all internal global lock functions to a new file, evglock.c.

Updated internal address SpaceID for DataTable regions. Moved this internal space id in preparation for ACPI 5.0 changes that will include some new space IDs. This change should not affect user/host code.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 9.0):

Non-Debug Version: 89.8K Code, 23.8K Data, 113.6K Total

Debug Version: 164.2K Code, 67.9K Data, 232.1K Total

Current Release (VC 9.0):

Non-Debug Version: 90.0K Code, 23.8K Data, 113.8K Total

Debug Version: 164.5K Code, 68.0K Data, 232.5K Total

2) iASL Compiler/Disassembler and Tools:

iASL/DTC: Major update for new grammar features. Allow generic data types in custom ACPI tables. Field names are now optional. Any line can be split to multiple lines using the continuation char (\). Large buffers now use line-continuation character(s) and no colon on the continuation lines. See the grammar

update in the iASL compiler reference. ACPI BZ 910,911. Lin Ming, Bob Moore.

iASL: Mark ASL "Return()" and the simple "Return" as "Null" return statements. Since the parser stuffs a "zero" as the return value for these statements (due to the underlying AML grammar), they were seen as "return with value" by the iASL semantic checking. They are now seen correctly as "null" return statements.

iASL: Check if a _REG declaration has a corresponding Operation Region. Adds a check for each _REG to ensure that there is in fact a corresponding operation region declaration in the same scope. If not, the _REG method is not very useful since it probably won't be executed. ACPICA BZ 915.

iASL/DTC: Finish support for expression evaluation. Added a new expression parser that implements c-style operator precedence and parenthesization. ACPICA bugzilla 908.

Disassembler/DTC: Remove support for () and <> style comments in data tables. Now that DTC has full expression support, we don't want to have comment strings that start with a parentheses or a less-than symbol. Now, only the standard /* and // comments are supported, as well as the bracket [] comments.

AcpiXtract: Fix for RSDP and dynamic SSDT extraction. These tables have "unusual" headers in the acpidump file. Update the header validation to support these tables. Problem introduced in previous AcpiXtract version in the change to support "wrong checksum" error messages emitted by acpidump utility.

iASL: Add a * option to generate all template files (as a synonym for ALL) as in "iasl -T *" or "iasl -T ALL".

iASL/DTC: Do not abort compiler on fatal errors. We do not want to completely

abort the compiler on "fatal" errors, simply should abort the current compile.
This allows multiple compiles with a single (possibly wildcard) compiler invocation.

16 March 2011. Summary of changes for version 20110316:

1) ACPI CA Core Subsystem:

Fixed a problem caused by a `_PRW` method appearing at the namespace root scope during the setup of wake GPEs. A fault could occur if a `_PRW` directly under the root object was passed to the `AcpiSetupGpeForWake` interface. Lin Ming.

Implemented support for "spurious" Global Lock interrupts. On some systems, a global lock interrupt can occur without the pending flag being set. Upon a GL interrupt, we now ensure that a thread is actually waiting for the lock before signaling GL availability. Rafael Wysocki, Bob Moore.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 9.0):

Non-Debug Version: 89.7K Code, 23.7K Data, 113.4K Total

Debug Version: 163.9K Code, 67.5K Data, 231.4K Total

Current Release (VC 9.0):

Non-Debug Version: 89.8K Code, 23.8K Data, 113.6K Total

Debug Version: 164.2K Code, 67.9K Data, 232.1K Total

2) iASL Compiler/Disassembler and Tools:

Implemented full support for the "SLIC" ACPI table. Includes support in the header files, disassembler, table compiler, and template generator. Bob Moore, Lin Ming.

`AcpiXtract`: Correctly handle embedded comments and messages from `AcpiDump`. Apparently some or all versions of `acpidump` will occasionally emit a comment like "Wrong checksum", etc., into the dump file. This was causing problems for `AcpiXtract`. ACPICA BZ 905.

iASL: Fix the Linux makefile by removing an inadvertent double file inclusion. ACPICA BZ 913.

AcpiExec: Update installation of operation region handlers. Install one handler for a user-defined address space. This is used by the ASL test suite (ASLTS).

11 February 2011. Summary of changes for version 20110211:

1) ACPI CA Core Subsystem:

Added a mechanism to defer _REG methods for some early-installed handlers. Most user handlers should be installed before call to AcpiEnableSubsystem. However, Event handlers and region handlers should be installed after AcpiInitializeObjects. Override handlers for the "default" regions should be installed early, however. This change executes all _REG methods for the default regions (Memory/IO/PCI/DataTable) simultaneously to prevent any chicken/egg issues between them. ACPICA BZ 848.

Implemented an optimization for GPE detection. This optimization will simply ignore GPE registers that contain no enabled GPEs -- there is no need to read the register since this information is available internally. This becomes more important on machines with a large GPE space. ACPICA bugzilla 884. Lin Ming. Suggestion from Joe Liu.

Removed all use of the highly unreliable FADT revision field. The revision number in the FADT has been found to be completely unreliable and cannot be trusted. Only the actual table length can be used to infer the version. This change updates the ACPICA core and the disassembler so that both no longer even look at the FADT version and instead depend solely upon the FADT length.

Fix an unresolved name issue for the no-debug and no-error-message source generation cases. The _AcpiModuleName was left undefined in these cases, but it is actually needed as a parameter to some interfaces. Define _AcpiModuleName as a null string in these cases. ACPICA Bugzilla 888.

Split several large files (makefiles and project files updated)

utglobal.c -> utdecode.c
dbcomds.c -> dbmethod.c dbnames.c
dsopcode.c -> dsargs.c dscontrol.c
dsload.c -> dsload2.c
aslanalyze.c -> aslbtypes.c aslwalks.c

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 9.0):

Non-Debug Version: 89.7K Code, 23.7K Data, 113.4K Total
Debug Version: 163.9K Code, 67.5K Data, 231.4K Total
Current Release (VC 9.0):
Non-Debug Version: 89.7K Code, 23.7K Data, 113.4K Total
Debug Version: 163.9K Code, 67.5K Data, 231.4K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented the predefined macros `__LINE__`, `__FILE__`, and `__DATE__`. These are useful C-style macros with the standard definitions. ACPICA bugzilla 898.

iASL/DTC: Added support for integer expressions and labels. Support for full expressions for all integer fields in all ACPI tables. Support for labels in "generic" portions of tables such as UEFI. See the iASL reference manual.

Debugger: Added a command to display the status of global handlers. The "handlers" command will display op region, fixed event, and miscellaneous global handlers. installation status -- and for op regions, whether default or user-installed handler will be used.

iASL: Warn if reserved method incorrectly returns a value. Many predefined names are defined such that they do not return a value. If implemented as a method, issue a warning if such a name explicitly returns a value. ACPICA Bugzilla 855.

iASL: Added detection of GPE method name conflicts. Detects a conflict where there are two GPE methods of the form `_Lxy` and `_Exy` in the same scope. (For example, `_L1D` and `_E1D` in the same scope.) ACPICA bugzilla 848.

iASL/DTC: Fixed a couple input scanner issues with comments and line numbers. Comment remover could get confused and miss a comment ending. Fixed a problem with line counter maintenance.

iASL/DTC: Reduced the severity of some errors from fatal to error. There is no need to abort on simple errors within a field definition.

Debugger: Simplified the output of the help command. All help output now in a single screen, instead of help subcommands. ACPICA Bugzilla 897.

12 January 2011. Summary of changes for version 20110112:

1) ACPI CA Core Subsystem:

Fixed a race condition between method execution and namespace walks that can possibly cause a fault. The problem was apparently introduced in version 20100528 as a result of a performance optimization that reduces the number of

namespace walks upon method exit by using the `delete_namespace_subtree` function instead of the `delete_namespace_by_owner` function used previously. Bug is a missing namespace lock in the `delete_namespace_subtree` function. dana.myers@oracle.com

Fixed several issues and a possible fault with the automatic "serialized" method support. History: This support changes a method to "serialized" on the fly if the method generates an `AE_ALREADY_EXISTS` error, indicating the possibility that it cannot handle reentrancy. This fix repairs a couple of issues seen in the field, especially on machines with many cores:

- 1) Delete method children only upon the exit of the last thread, so as to not delete objects out from under other running threads (and possibly causing a fault.)
- 2) Set the "serialized" bit for the method only upon the exit of the Last thread, so as to not cause deadlock when running threads attempt to exit.
- 3) Clean up the use of the AML "MethodFlags" and internal method flags so that there is no longer any confusion between the two.

Lin Ming, Bob Moore. Reported by dana.myers@oracle.com.

Debugger: Now lock the namespace for duration of a namespace dump. Prevents issues if the namespace is changing dynamically underneath the debugger. Especially affects temporary namespace nodes, since the debugger displays these also.

Updated the ordering of include files. The ACPICA headers should appear before any compiler-specific headers (`stdio.h`, etc.) so that `acenv.h` can set any necessary compiler-specific defines, etc. Affects the ACPI-related tools and utilities.

Updated all ACPICA copyrights and signons to 2011. Added the 2011 copyright to all module headers and signons, including the Linux header. This affects virtually every file in the ACPICA core subsystem, iASL compiler, and all utilities.

Added project files for MS Visual Studio 2008 (VC++ 9.0). The original project files for VC++ 6.0 are now obsolete. New project files can be found under `acpica/generate/msvc9`. See `acpica/generate/msvc9/readme.txt` for details.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 9.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release (VC 6.0):

Non-Debug Version: 89.8K Code, 18.9K Data, 108.7K Total
Debug Version: 166.6K Code, 52.1K Data, 218.7K Total
Current Release (VC 9.0):
Non-Debug Version: 89.7K Code, 23.7K Data, 113.4K Total
Debug Version: 163.9K Code, 67.5K Data, 231.4K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Added generic data types to the Data Table compiler. Add "generic" data types such as UINT32, String, Unicode, etc., to simplify the generation of platform-defined tables such as UEFI. Lin Ming.

iASL: Added listing support for the Data Table Compiler. Adds listing support (-l) to display actual binary output for each line of input code.

09 December 2010. Summary of changes for version 20101209:

1) ACPI CA Core Subsystem:

Completed the major overhaul of the GPE support code that was begun in July 2010. Major features include: removal of `_PRW` execution in `ACPICA` (host executes `_PRWs` anyway), cleanup of "wake" GPE interfaces and processing, changes to existing interfaces, simplification of GPE handler operation, and a handful of new interfaces:

`AcpiUpdateAllGpes`

`AcpiFinishGpe`

`AcpiSetupGpeForWake`

`AcpiSetGpeWakeMask`

One new file, `evxfge.c` to consolidate all external GPE interfaces.

See the `ACPICA` Programmer Reference for full details and programming information. See the new section 4.4 "General Purpose Event (GPE) Support" for a full overview, and section 8.7 "ACPI General Purpose Event Management" for programming details. `ACPICA` BZ 858,870,877. Matthew Garrett, Lin Ming, Bob Moore, Rafael Wysocki.

Implemented a new GPE feature for Windows compatibility, the "Implicit Wake GPE Notify". This feature will automatically issue a `Notify(2)` on a device when a Wake GPE is received if there is no corresponding GPE method or handler. `ACPICA` BZ 870.

Fixed a problem with the `Scope()` operator during table parse and load phase. During load phase (table load or method execution), the scope operator should not enter the target into the namespace. Instead, it should open a new scope at the target location. Linux BZ 19462, `ACPICA` BZ 882.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 89.8K Code, 18.9K Data, 108.7K Total

Debug Version: 166.6K Code, 52.1K Data, 218.7K Total

Current Release:

Non-Debug Version: 89.9K Code, 19.0K Data, 108.9K Total

Debug Version: 166.3K Code, 52.1K Data, 218.4K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Relax the alphanumeric restriction on `_CID` strings. These strings are "bus-specific" per the ACPI specification, and therefore any characters are acceptable. The only checks that can be performed are for a null string and perhaps for a leading asterisk. ACPICA BZ 886.

iASL: Fixed a problem where a syntax error that caused a premature EOF condition on the source file emitted a very confusing error message. The premature EOF is now detected correctly. ACPICA BZ 891.

Disassembler: Decode the `AccessSize` within a Generic Address Structure (byte access, word access, etc.) Note, this field does not allow arbitrary bit access, the size is encoded as 1=byte, 2=word, 3=dword, and 4=qword.

New: `AcpiNames` utility - Example namespace dump utility. Shows an example of ACPICA configuration for a minimal namespace dump utility. Uses table and namespace managers, but no AML interpreter. Does not add any functionality over `AcpiExec`, it is a subset of `AcpiExec`. The purpose is to show how to partition and configure ACPICA. ACPICA BZ 883.

AML Debugger: Increased the debugger buffer size for method return objects. Was 4K, increased to 16K. Also enhanced error messages for debugger method execution, including the buffer overflow case.

13 October 2010. Summary of changes for version 20101013:

1) ACPI CA Core Subsystem:

Added support to clear the `PCIEXP_WAKE` event. When clearing ACPI events, now clear the `PCIEXP_WAKE_STS` bit in the ACPI PM1 Status Register, via `HwClearAcpiStatus`. Original change from Colin King. ACPICA BZ 880.

Changed the type of the predefined namespace object `_TZ` from `ThermalZone` to `Device`. This was found to be confusing to the host software that processes

the various thermal zones, since `_TZ` is not really a `ThermalZone`. However, a `Notify()` can still be performed on it. ACPICA BZ 876. Suggestion from Rui Zhang.

Added Windows Vista SP2 to the list of supported `_OSI` strings. The actual string is "Windows 2006 SP2".

Eliminated duplicate code in `AcpiUtExecute*` functions. Now that the `nsrepair` code automatically repairs `_HID`-related strings, this type of code is no longer needed in `Execute_HID`, `Execute_CID`, and `Execute_UID`. ACPICA BZ 878.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 89.9K Code, 19.0K Data, 108.9K Total

Debug Version: 166.3K Code, 52.1K Data, 218.4K Total

Current Release:

Non-Debug Version: 89.9K Code, 19.0K Data, 108.9K Total

Debug Version: 166.3K Code, 52.1K Data, 218.4K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented additional compile-time validation for `_HID` strings. The non-hex prefix (such as "PNP" or "ACPI") must be uppercase, and the length of the string must be exactly seven or eight characters. For both `_HID` and `_CID` strings, all characters must be alphanumeric. ACPICA BZ 874.

iASL: Allow certain "null" resource descriptors. Some BIOS code creates descriptors that are mostly or all zeros, with the expectation that they will be filled in at runtime. iASL now allows this as long as there is a "resource tag" (name) associated with the descriptor, which gives the ASL a handle needed to modify the descriptor. ACPICA BZ 873.

Added single-thread support to the generic Unix application OSL. Primarily for iASL support, this change removes the use of semaphores in the single-threaded ACPICA tools/applications - increasing performance. The `_MULTI_THREADED` option was replaced by the (reverse) `ACPI_SINGLE_THREADED` option. ACPICA BZ 879.

AcpiExec: several fixes for the 64-bit version. Adds XSDT support and support for 64-bit DSDT/FACS addresses in the FADT. Lin Ming.

iASL: Moved all compiler messages to a new file, `aslmessages.h`.

15 September 2010. Summary of changes for version 20100915:

1) ACPI CA Core Subsystem:

Removed the `AcpiOsDerivePciId` OSL interface. The various host implementations of this function were not OS-dependent and are now obsolete and can be removed from all host OSLs. This function has been replaced by `AcpiHwDerivePciId`, which is now part of the ACPICA core code. `AcpiHwDerivePciId` has been implemented without recursion. Adds one new module, `hwpci.c`. ACPICA BZ 857.

Implemented a dynamic repair for `_HID` and `_CID` strings. The following problems are now repaired at runtime: 1) Remove a leading asterisk in the string, and 2) the entire string is uppercased. Both repairs are in accordance with the ACPI specification and will simplify host driver code. ACPICA BZ 871.

The `ACPI_THREAD_ID` type is no longer configurable, internally it is now always `UINT64`. This simplifies the ACPICA code, especially any `printf` output. `UINT64` is the only common data type for all `thread_id` types across all operating systems. It is now up to the host OSL to cast the native `thread_id` type to `UINT64` before returning the value to ACPICA (via `AcpiOsGetThreadId`). Lin Ming, Bob Moore.

Added the `ACPI_INLINE` type to enhance the ACPICA configuration. The "inline" keyword is not standard across compilers, and this type allows inline to be configured on a per-compiler basis. Lin Ming.

Made the system global `AcpiGbl_SystemAwakeAndRunning` publically available. Added an extern for this boolean in `acpixf.h`. Some hosts utilize this value during suspend/restore operations. ACPICA BZ 869.

All code that implements error/warning messages with the "ACPI:" prefix has been moved to a new module, `utxferror.c`.

The `UINT64_OVERLAY` was moved to `utmath.c`, which is the only module where it is used. ACPICA BZ 829. Lin Ming, Bob Moore.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 89.1K Code, 19.0K Data, 108.1K Total

Debug Version: 165.1K Code, 51.9K Data, 217.0K Total

Current Release:

Non-Debug Version: 89.9K Code, 19.0K Data, 108.9K Total

Debug Version: 166.3K Code, 52.1K Data, 218.4K Total

2) iASL Compiler/Disassembler and Tools:

iASL/Disassembler: Write ACPI errors to stderr instead of the output file.

This keeps the output files free of random error messages that may originate from within the namespace/interpreter code. Used this opportunity to merge all ACPI-style messages into a single new module, utxferror.c. ACPICA BZ 866. Lin Ming, Bob Moore.

Tools: update some printf's for ansi warnings on size_t. Handle width change of size_t on 32-bit versus 64-bit generations. Lin Ming.

06 August 2010. Summary of changes for version 20100806:

1) ACPI CA Core Subsystem:

Designed and implemented a new host interface to the _OSI support code. This will allow the host to dynamically add or remove multiple _OSI strings, as well as install an optional handler that is called for each _OSI invocation. Also added a new AML debugger command, 'osi' to display and modify the global _OSI string table, and test support in the AcpiExec utility. See the ACPICA reference manual for full details. Lin Ming, Bob Moore. ACPICA BZ 836.

New Functions:

- AcpiInstallInterface - Add an _OSI string.
- AcpiRemoveInterface - Delete an _OSI string.
- AcpiInstallInterfaceHandler - Install optional _OSI handler.

Obsolete Functions:

- AcpiOsValidateInterface - no longer used.

New Files:

source/components/utilities/utosi.c

Re-introduced the support to enable multi-byte transfers for Embedded Controller (EC) operation regions. A reported problem was found to be a bug in the host OS, not in the multi-byte support. Previously, the maximum data size passed to the EC operation region handler was a single byte. There are often EC Fields larger than one byte that need to be transferred, and it is useful for the EC driver to lock these as a single transaction. This change enables single transfers larger than 8 bits. This effectively changes the access to the EC space from ByteAcc to AnyAcc, and will probably require changes to the host OS Embedded Controller driver to enable 16/32/64/256-bit transfers in addition to 8-bit transfers. Alexey Starikovskiy, Lin Ming.

Fixed a problem with the prototype for AcpiOsReadPciConfiguration. The prototype in acpiosxf.h had the output value pointer as a (void *). It should be a (UINT64 *). This may affect some host OSL code.

Fixed a couple problems with the recently modified Linux makefiles for iASL and AcpiExec. These new makefiles place the generated object files in the local directory so that there can be no collisions between the files that are shared between them that are compiled with different options.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 88.3K Code, 18.8K Data, 107.1K Total

Debug Version: 164.0K Code, 51.5K Data, 215.5K Total

Current Release:

Non-Debug Version: 89.1K Code, 19.0K Data, 108.1K Total

Debug Version: 165.1K Code, 51.9K Data, 217.0K Total

2) iASL Compiler/Disassembler and Tools:

iASL/Disassembler: Added a new option (`-da`, "disassemble all") to load the namespace from and disassemble an entire group of AML files. Useful for loading all of the AML tables for a given machine (DSDT, SSDT1...SSDTn) and disassembling with one simple command. ACPICA BZ 865. Lin Ming.

iASL: Allow multiple invocations of `-e` option. This change allows multiple uses of `-e` on the command line: "`-e ssdt1.dat -e ssdt2.dat`". ACPICA BZ 834. Lin Ming.

02 July 2010. Summary of changes for version 20100702:

1) ACPI CA Core Subsystem:

Implemented several updates to the recently added GPE reference count support. The model for "wake" GPEs is changing to give the host OS complete control of these GPEs. Eventually, the ACPICA core will not execute any `_PRW` methods, since the host already must execute them. Also, additional changes were made to help ensure that the reference counts are kept in proper synchronization with reality. Rafael J. Wysocki.

- 1) Ensure that GPEs are not enabled twice during initialization.
- 2) Ensure that GPE enable masks stay in sync with the reference count.
- 3) Do not inadvertently enable GPEs when writing GPE registers.
- 4) Remove the internal wake reference counter and add new `AcpiGpeWakeup` interface. This interface will set or clear individual GPEs for wakeup.
- 5) Remove `GpeType` argument from `AcpiEnable` and `AcpiDisable`. These interfaces are now used for "runtime" GPEs only.

Changed the behavior of the GPE install/remove handler interfaces. The GPE is no longer disabled during this process, as it was found to cause problems on some machines. Rafael J. Wysocki.

Reverted a change introduced in version 20100528 to enable Embedded Controller multi-byte transfers. This change was found to cause problems with Index Fields and possibly Bank Fields. It will be reintroduced when these problems have been resolved.

Fixed a problem with references to Alias objects within Package Objects. A reference to an Alias within the definition of a Package was not always resolved properly. Aliases to objects like Processors, Thermal zones, etc. were resolved to the actual object instead of a reference to the object as it should be. Package objects are only allowed to contain integer, string, buffer, package, and reference objects. Redhat bugzilla 608648.

Example Code and Data Size: These are the sizes for the OS-independent `apica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 88.3K Code, 18.8K Data, 107.1K Total

Debug Version: 164.1K Code, 51.5K Data, 215.6K Total

Current Release:

Non-Debug Version: 88.3K Code, 18.8K Data, 107.1K Total

Debug Version: 164.0K Code, 51.5K Data, 215.5K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented a new compiler subsystem to allow definition and compilation of the non-AML ACPI tables such as FADT, MADT, SRAT, etc. These are called "ACPI Data Tables", and the new compiler is the "Data Table Compiler". This compiler is intended to simplify the existing error-prone process of creating these tables for the BIOS, as well as allowing the disassembly, modification, recompilation, and override of existing ACPI data tables. See the iASL User Guide for detailed information.

iASL: Implemented a new Template Generator option in support of the new Data Table Compiler. This option will create examples of all known ACPI tables that can be used as the basis for table development. See the iASL documentation and the `-T` option.

Disassembler and headers: Added support for the WDDT ACPI table (Watchdog Descriptor Table).

Updated the Linux makefiles for iASL and AcpiExec to place the generated object files in the local directory so that there can be no collisions

between the shared files between them that are generated with different options.

Added support for Mac OS X in the Unix OSL used for iASL and AcpiExec. Use the `#define __APPLE__` to enable this support.

28 May 2010. Summary of changes for version 20100528:

Note: The ACPI 4.0a specification was released on April 5, 2010 and is available at www.acpi.info. This is primarily an errata release.

1) ACPI CA Core Subsystem:

Undefined ACPI tables: We are looking for the definitions for the following ACPI tables that have been seen in the field: ATKG, IEIT, GSCI.

Implemented support to enable multi-byte transfers for Embedded Controller (EC) operation regions. Previously, the maximum data size passed to the EC operation region handler was a single byte. There are often EC Fields larger than one byte that need to be transferred, and it is useful for the EC driver to lock these as a single transaction. This change enables single transfers larger than 8 bits. This effectively changes the access to the EC space from ByteAcc to AnyAcc, and will probably require changes to the host OS Embedded Controller driver to enable 16/32/64/256-bit transfers in addition to 8-bit transfers. Alexey Starikovskiy, Lin Ming

Implemented a performance enhancement for namespace search and access. This change enhances the performance of namespace searches and walks by adding a backpointer to the parent in each namespace node. On large namespaces, this change can improve overall ACPI performance by up to 9X. Adding a pointer to each namespace node increases the overall size of the internal namespace by about 5%, since each namespace entry usually consists of both a namespace node and an ACPI operand object. However, this is the first growth of the namespace in ten years. ACPICA bugzilla 817. Alexey Starikovskiy.

Implemented a performance optimization that reduces the number of namespace walks. On control method exit, only walk the namespace if the method is known to have created namespace objects outside of its local scope. Previously, the entire namespace was traversed on each control method exit. This change can improve overall ACPI performance by up to 3X. Alexey Starikovskiy, Bob Moore.

Added support to truncate I/O addresses to 16 bits for Windows compatibility. Some ASL code has been seen in the field that inadvertently has bits set above bit 15. This feature is optional and is enabled if the BIOS requests any Windows OSI strings. It can also be enabled by the host OS. Matthew Garrett, Bob Moore.

Added support to limit the maximum time for the ASL Sleep() operator. To prevent accidental deep sleeps, limit the maximum time that Sleep() will actually sleep. Configurable, the default maximum is two seconds. ACPICA bugzilla 854.

Added run-time validation support for the _WDG and _WED Microsoft predefined methods. These objects are defined by "Windows Instrumentation", and are not part of the ACPI spec. ACPICA BZ 860.

Expanded all statistic counters used during namespace and device initialization from 16 to 32 bits in order to support very large namespaces.

Replaced all instances of %d in printf format specifiers with %u since nearly all integers in ACPICA are unsigned.

Fixed the exception namestring for AE_WAKE_ONLY_GPE. Was incorrectly returned as AE_NO_HANDLER.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 88.4K Code, 18.8K Data, 107.2K Total

Debug Version: 164.2K Code, 51.5K Data, 215.7K Total

Current Release:

Non-Debug Version: 88.3K Code, 18.8K Data, 107.1K Total

Debug Version: 164.1K Code, 51.5K Data, 215.6K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Added compiler support for the _WDG and _WED Microsoft predefined methods. These objects are defined by "Windows Instrumentation", and are not part of the ACPI spec. ACPICA BZ 860.

AcpiExec: added option to disable the memory tracking mechanism. The -dt option will disable the tracking mechanism, which improves performance considerably.

AcpiExec: Restructured the command line options into -d (disable) and -e (enable) options.

28 April 2010. Summary of changes for version 20100428:

1) ACPI CA Core Subsystem:

Implemented GPE support for dynamically loaded ACPI tables. For all GPEs, including FADT-based and GPE Block Devices, execute any `_PRW` methods in the new table, and process any `_Lxx/_Exx` GPE methods in the new table. Any runtime GPE that is referenced by an `_Lxx/_Exx` method in the new table is immediately enabled. Handles the FADT-defined GPEs as well as GPE Block Devices. Provides compatibility with other ACPI implementations. Two new files added, `evgpeinit.c` and `evgpeutil.c`. ACPICA BZ 833. Lin Ming, Bob Moore.

Fixed a regression introduced in version 20100331 within the table manager where initial table loading could fail. This was introduced in the fix for `AcpiReallocateRootTable`. Also, renamed some of fields in the table manager data structures to clarify their meaning and use.

Fixed a possible allocation overrun during internal object copy in `AcpiUtCopySimpleObject`. The original code did not correctly handle the case where the object to be copied was a namespace node. Lin Ming. ACPICA BZ 847.

Updated the allocation dump routine, `AcpiUtDumpAllocation` and fixed a possible access beyond end-of-allocation. Also, now fully validate descriptor (size and type) before output. Lin Ming, Bob Moore. ACPICA BZ 847

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 87.9K Code, 18.6K Data, 106.5K Total

Debug Version: 163.5K Code, 51.3K Data, 214.8K Total

Current Release:

Non-Debug Version: 88.4K Code, 18.8K Data, 107.2K Total

Debug Version: 164.2K Code, 51.5K Data, 215.7K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented Min/Max/Len/Gran validation for address resource descriptors. This change implements validation for the address fields that are common to all address-type resource descriptors. These checks are implemented: Checks for valid Min/Max, length within the Min/Max window, valid granularity, Min/Max a multiple of granularity, and `_MIF/_MAF` as per table 6-40 in the ACPI 4.0a specification. Also split the large `aslstype1.c` and `aslstype2.c` files into five new files. ACPICA BZ 840.

iASL: Added support for the `_Wxx` predefined names. This support was missing and these names were not recognized by the compiler as valid predefined names. ACPICA BZ 851.

iASL: Added an error for all predefined names that are defined to return no

value and thus must be implemented as Control Methods. These include all of the `_Lxx`, `_Exx`, `_Wxx`, and `_Qxx` names, as well as some other miscellaneous names such as `_DIS`, `_INI`, `_IRC`, `_OFF`, `_ON`, and `_PSx`. ACPICA BZ 850, 856.

iASL: Implemented the `-ts` option to emit hex AML data in ASL format, as an ASL Buffer. Allows ACPI tables to be easily included within ASL files, to be dynamically loaded via the `Load()` operator. Also cleaned up output for the `-ta` and `-tc` options. ACPICA BZ 853.

Tests: Added a new file with examples of extended iASL error checking. Demonstrates the advanced error checking ability of the iASL compiler. Available at `tests/misc/badcode.asl`.

31 March 2010. Summary of changes for version 20100331:

1) ACPI CA Core Subsystem:

Completed a major update for the GPE support in order to improve support for shared GPEs and to simplify both host OS and ACPICA code. Added a reference count mechanism to support shared GPEs that require multiple device drivers. Several external interfaces have changed. One external interface has been removed. One new external interface was added. Most of the GPE external interfaces now use the GPE spinlock instead of the events mutex (and the `Flags` parameter for many GPE interfaces has been removed.) See the updated ACPICA Programmer Reference for details. Matthew Garrett, Bob Moore, Rafael Wysocki. ACPICA BZ 831.

Changed:

`AcpiEnableGpe`, `AcpiDisableGpe`, `AcpiClearGpe`, `AcpiGetGpeStatus`

Removed:

`AcpiSetGpeType`

New:

`AcpiSetGpe`

Implemented write support for `DataTable` operation regions. These regions are defined via the `DataTableRegion()` operator. Previously, only read support was implemented. The ACPI specification allows `DataTableRegions` to be read/write, however.

Implemented a new subsystem option to force a copy of the DSDT to local memory. Optionally copy the entire DSDT to local memory (instead of simply mapping it.) There are some (albeit very rare) BIOSs that corrupt or replace the original DSDT, creating the need for this option. Default is `FALSE`, do not copy the DSDT.

Implemented detection of a corrupted or replaced DSDT. This change adds support to detect a DSDT that has been corrupted and/or replaced from outside

the OS (by firmware). This is typically catastrophic for the system, but has been seen on some machines. Once this problem has been detected, the DSDT copy option can be enabled via system configuration. Lin Ming, Bob Moore.

Fixed two problems with AcpiReallocateRootTable during the root table copy. When copying the root table to the new allocation, the length used was incorrect. The new size was used instead of the current table size, meaning too much data was copied. Also, the count of available slots for ACPI tables was not set correctly. Alexey Starikovskiy, Bob Moore.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 87.5K Code, 18.4K Data, 105.9K Total

Debug Version: 163.4K Code, 51.1K Data, 214.5K Total

Current Release:

Non-Debug Version: 87.9K Code, 18.6K Data, 106.5K Total

Debug Version: 163.5K Code, 51.3K Data, 214.8K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implement limited typechecking for values returned from predefined control methods. The type of any returned static (unnamed) object is now validated. For example, Return(1). ACPICA BZ 786.

iASL: Fixed a predefined name object verification regression. Fixes a problem introduced in version 20100304. An error is incorrectly generated if a predefined name is declared as a static named object with a value defined using the keywords "Zero", "One", or "Ones". Lin Ming.

iASL: Added Windows 7 support for the -g option (get local ACPI tables) by reducing the requested registry access rights. ACPICA BZ 842.

Disassembler: fixed a possible fault when generating External() statements. Introduced in commit ae7d6fd: Properly handle externals with parent-prefix (carat). Fixes a string length allocation calculation. Lin Ming.

04 March 2010. Summary of changes for version 20100304:

1) ACPI CA Core Subsystem:

Fixed a possible problem with the AML Mutex handling function AcpiExReleaseMutex where the function could fault under the very rare condition when the interpreter has blocked, the interpreter lock is released,

the interpreter is then reentered via the same thread, and attempts to acquire an AML mutex that was previously acquired. FreeBSD report 140979. Lin Ming.

Implemented additional configuration support for the AML "Debug Object". Output from the debug object can now be enabled via a global variable, `AcpiGbl_EnableAmlDebugObject`. This will assist with remote machine debugging. This debug output is now available in the release version of ACPICA instead of just the debug version. Also, the entire debug output module can now be configured out of the ACPICA build if desired. One new file added, `executer/exdebug.c`. Lin Ming, Bob Moore.

Added header support for the ACPI MCHI table (Management Controller Host Interface Table). This table was added in ACPI 4.0, but the defining document has only recently become available.

Standardized output of integer values for ACPICA warnings/errors. Always use `0x` prefix for hex output, always use `%u` for unsigned integer decimal output. Affects `ACPI_INFO`, `ACPI_ERROR`, `ACPI_EXCEPTION`, and `ACPI_WARNING` (about 400 invocations.) These invocations were converted from the original `ACPI_DEBUG_PRINT` invocations and were not consistent. ACPICA BZ 835.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 87.1K Code, 18.0K Data, 105.1K Total

Debug Version: 163.5K Code, 50.9K Data, 214.4K Total

Current Release:

Non-Debug Version: 87.5K Code, 18.4K Data, 105.9K Total

Debug Version: 163.4K Code, 51.1K Data, 214.5K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented typechecking support for static (non-control method) predefined named objects that are declared with the `Name()` operator. For example, the type of this object is now validated to be of type `Integer`: `Name(_BBN, 1)`. This change migrates the compiler to using the core predefined name table instead of maintaining a local version. Added a new file, `aslpredef.c`. ACPICA BZ 832.

Disassembler: Added support for the ACPI 4.0 MCHI table.

21 January 2010. Summary of changes for version 20100121:

1) ACPI CA Core Subsystem:

Added the 2010 copyright to all module headers and signons. This affects virtually every file in the ACPI CA core subsystem, the iASL compiler, the tools/utilities, and the test suites.

Implemented a change to the AcpiGetDevices interface to eliminate unnecessary invocations of the _STA method. In the case where a specific _HID is requested, do not run _STA until a _HID match is found. This eliminates potentially dozens of _STA calls during a search for a particular device/HID, which in turn can improve boot times. ACPI CA BZ 828. Lin Ming.

Implemented an additional repair for predefined method return values. Attempt to repair unexpected NULL elements within returned Package objects. Create an Integer of value zero, a NULL String, or a zero-length Buffer as appropriate. ACPI CA BZ 818. Lin Ming, Bob Moore.

Removed the obsolete ACPI_INTEGER data type. This type was introduced as the code was migrated from ACPI 1.0 (with 32-bit AML integers) to ACPI 2.0 (with 64-bit AML integers). It is now obsolete and this change removes it from the ACPI CA code base, replaced by UINT64. The original typedef has been retained for now for compatibility with existing device driver code. ACPI CA BZ 824.

Removed the unused UINT32_STRUCT type, and the obsolete Integer64 field in the parse tree object.

Added additional warning options for the gcc-4 generation. Updated the source accordingly. This includes some code restructuring to eliminate unreachable code, elimination of some gotos, elimination of unused return values, some additional casting, and removal of redundant declarations.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 87.0K Code, 18.0K Data, 105.0K Total

Debug Version: 163.4K Code, 50.8K Data, 214.2K Total

Current Release:

Non-Debug Version: 87.1K Code, 18.0K Data, 105.1K Total

Debug Version: 163.5K Code, 50.9K Data, 214.4K Total

2) iASL Compiler/Disassembler and Tools:

No functional changes for this release.

14 December 2009. Summary of changes for version 20091214:

1) ACPI CA Core Subsystem:

Enhanced automatic data type conversions for predefined name repairs. This change expands the automatic repairs/conversions for predefined name return values to make Integers, Strings, and Buffers fully interchangeable. Also, a Buffer can be converted to a Package of Integers if necessary. The nsrepair.c module was completely restructured. Lin Ming, Bob Moore.

Implemented automatic removal of null package elements during predefined name repairs. This change will automatically remove embedded and trailing NULL package elements from returned package objects that are defined to contain a variable number of sub-packages. The driver is then presented with a package with no null elements to deal with. ACPICA BZ 819.

Implemented a repair for the predefined _FDE and _GTM names. The expected return value for both names is a Buffer of 5 DWORDs. This repair fixes two possible problems (both seen in the field), where a package of integers is returned, or a buffer of BYTES is returned. With assistance from Jung-uk Kim.

Implemented additional module-level code support. This change will properly execute module-level code that is not at the root of the namespace (under a Device object, etc.). Now executes the code within the current scope instead of the root. ACPICA BZ 762. Lin Ming.

Fixed possible mutex acquisition errors when running _REG methods. Fixes a problem where mutex errors can occur when running a _REG method that is in the same scope as a method-defined operation region or an operation region under a module-level IF block. This type of code is rare, so the problem has not been seen before. ACPICA BZ 826. Lin Ming, Bob Moore.

Fixed a possible memory leak during module-level code execution. An object could be leaked for each block of executed module-level code if the interpreter slack mode is enabled. This change deletes any implicitly returned object from the module-level code block. Lin Ming.

Removed messages for successful predefined repair(s). The repair mechanism was considered too wordy. Now, messages are only unconditionally emitted if the return object cannot be repaired. Existing messages for successful repairs were converted to ACPI_DEBUG_PRINT messages for now. ACPICA BZ 827.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 86.6K Code, 18.2K Data, 104.8K Total
Debug Version: 162.7K Code, 50.8K Data, 213.5K Total
Current Release:
Non-Debug Version: 87.0K Code, 18.0K Data, 105.0K Total
Debug Version: 163.4K Code, 50.8K Data, 214.2K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Fixed a regression introduced in 20091112 where intermediate .SRC files were no longer automatically removed at the termination of the compile.

acpiexec: Implemented the -f option to specify default region fill value. This option specifies the value used to initialize buffers that simulate operation regions. Default value is zero. Useful for debugging problems that depend on a specific initial value for a region or field.

12 November 2009. Summary of changes for version 20091112:

1) ACPI CA Core Subsystem:

Implemented a post-order callback to AcpiWalkNamespace. The existing interface only has a pre-order callback. This change adds an additional parameter for a post-order callback which will be more useful for bus scans. ACPICA BZ 779. Lin Ming. Updated the ACPICA Programmer Reference.

Modified the behavior of the operation region memory mapping cache for SystemMemory. Ensure that the memory mappings created for operation regions do not cross 4K page boundaries. Crossing a page boundary while mapping regions can cause kernel warnings on some hosts if the pages have different attributes. Such regions are probably BIOS bugs, and this is the workaround. Linux BZ 14445. Lin Ming.

Implemented an automatic repair for predefined methods that must return sorted lists. This change will repair (by sorting) packages returned by _ALR, _PSS, and _TSS. Drivers can now assume that the packages are correctly sorted and do not contain NULL package elements. Adds one new file, namespace/nsrepair2.c. ACPICA BZ 784. Lin Ming, Bob Moore.

Fixed a possible fault during predefined name validation if a return Package object contains NULL elements. Also adds a warning if a NULL element is followed by any non-null elements. ACPICA BZ 813, 814. Future enhancement may include repair or removal of all such NULL elements where possible.

Implemented additional module-level executable AML code support. This change will execute module-level code that is not at the root of the namespace (under a Device object, etc.) at table load time. Module-level executable AML code has been illegal since ACPI 2.0. ACPICA BZ 762. Lin Ming.

Implemented a new internal function to create Integer objects. This function simplifies miscellaneous object creation code. ACPICA BZ 823.

Reduced the severity of predefined repair messages, Warning to Info. Since the object was successfully repaired, a warning is too severe. Reduced to an info message for now. These messages may eventually be changed to debug-only. ACPICA BZ 812.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 85.8K Code, 18.0K Data, 103.8K Total

Debug Version: 161.8K Code, 50.6K Data, 212.4K Total

Current Release:

Non-Debug Version: 86.6K Code, 18.2K Data, 104.8K Total

Debug Version: 162.7K Code, 50.8K Data, 213.5K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Implemented Switch() with While(1) so that Break works correctly. This change correctly implements the Switch operator with a surrounding While(1) so that the Break operator works as expected. ACPICA BZ 461. Lin Ming.

iASL: Added a message if a package initializer list is shorter than package length. Adds a new remark for a Package() declaration if an initializer list exists, but is shorter than the declared length of the package. Although technically legal, this is probably a coding error and it is seen in the field. ACPICA BZ 815. Lin Ming, Bob Moore.

iASL: Fixed a problem where the compiler could fault after the maximum number of errors was reached (200).

acpixtract: Fixed a possible warning for pointer cast if the compiler warning level set very high.

13 October 2009. Summary of changes for version 20091013:

1) ACPI CA Core Subsystem:

Fixed a problem where an Operation Region _REG method could be executed more than once. If a custom address space handler is installed by the host before the "initialize operation regions" phase of the ACPICA initialization, any _REG methods for that address space could be executed twice. This change

fixes the problem. ACPICA BZ 427. Lin Ming.

Fixed a possible memory leak for the Scope() ASL operator. When the exact invocation of "Scope()" is executed (change scope to root), one internal operand object was leaked. Lin Ming.

Implemented a run-time repair for the _MAT predefined method. If the _MAT return value is defined as a Field object in the AML, and the field size is less than or equal to the default width of an integer (32 or 64), _MAT can incorrectly return an Integer instead of a Buffer. ACPICA now automatically repairs this problem. ACPICA BZ 810.

Implemented a run-time repair for the _BIF and _BIX predefined methods. The "OEM Information" field is often incorrectly returned as an Integer with value zero if the field is not supported by the platform. This is due to an ambiguity in the ACPI specification. The field should always be a string. ACPICA now automatically repairs this problem by returning a NULL string within the returned Package. ACPICA BZ 807.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 85.6K Code, 18.0K Data, 103.6K Total

Debug Version: 161.7K Code, 50.9K Data, 212.6K Total

Current Release:

Non-Debug Version: 85.8K Code, 18.0K Data, 103.8K Total

Debug Version: 161.8K Code, 50.6K Data, 212.4K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: Fixed a problem where references to external symbols that contained one or more parent-prefixes (carats) were not handled correctly, possibly causing a fault. ACPICA BZ 806. Lin Ming.

Disassembler: Restructured the code so that all functions that handle external symbols are in a single module. One new file is added, common/dmextern.c.

AML Debugger: Added a max count argument for the Batch command (which executes multiple predefined methods within the namespace.)

iASL: Updated the compiler documentation (User Reference.) Available at <http://www.acpica.org/documentation/>. ACPICA BZ 750.

AcpiXtract: Updated for Lint and other formatting changes. Close all open

files.

03 September 2009. Summary of changes for version 20090903:

1) ACPI CA Core Subsystem:

For Windows Vista compatibility, added the automatic execution of an `_INI` method located at the namespace root (`_INI`). This method is executed at table load time. This support is in addition to the automatic execution of `_SB._INI`. Lin Ming.

Fixed a possible memory leak in the interpreter for AML package objects if the package initializer list is longer than the defined size of the package. This apparently can only happen if the BIOS changes the package size on the fly (seen in a `_PSS` object), as ASL compilers do not allow this. The interpreter will truncate the package to the defined size (and issue an error message), but previously could leave the extra objects undeleted if they were pre-created during the argument processing (such is the case if the package consists of a number of sub-packages as in the `_PSS`.) ACPICA BZ 805.

Fixed a problem seen when a Buffer or String is stored to itself via ASL. This has been reported in the field. Previously, ACPICA would zero out the buffer/string. Now, the operation is treated as a noop. Provides Windows compatibility. ACPICA BZ 803. Lin Ming.

Removed an extraneous error message for ASL constructs of the form `Store(LocalX,LocalX)` when `LocalX` is uninitialized. These curious statements are seen in many BIOSs and are once again treated as NOOPs and no error is emitted when they are encountered. ACPICA BZ 785.

Fixed an extraneous warning message if a `_DSM` reserved method returns a Package object. `_DSM` can return any type of object, so validation on the return type cannot be performed. ACPICA BZ 802.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 85.5K Code, 18.0K Data, 103.5K Total

Debug Version: 161.6K Code, 50.9K Data, 212.5K Total

Current Release:

Non-Debug Version: 85.6K Code, 18.0K Data, 103.6K Total

Debug Version: 161.7K Code, 50.9K Data, 212.6K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Fixed a problem with the use of the Alias operator and Resource Templates. The correct alias is now constructed and no error is emitted. ACPICA BZ 738.

iASL: Implemented the -I option to specify additional search directories for include files. Allows multiple additional search paths for include files. Directories are searched in the order specified on the command line (after the local directory is searched.) ACPICA BZ 800.

iASL: Fixed a problem where the full pathname for include files was not emitted for warnings/errors. This caused the IDE support to not work properly. ACPICA BZ 765.

iASL: Implemented the -@ option to specify a Windows-style response file containing additional command line options. ACPICA BZ 801.

AcpiExec: Added support to load multiple AML files simultaneously (such as a DSDT and multiple SSDTs). Also added support for wildcards within the AML pathname. These features allow all machine tables to be easily loaded and debugged together. ACPICA BZ 804.

Disassembler: Added missing support for disassembly of HEST table Error Bank subtables.

30 July 2009. Summary of changes for version 20090730:

The ACPI 4.0 implementation for ACPICA is complete with this release.

1) ACPI CA Core Subsystem:

ACPI 4.0: Added header file support for all new and changed ACPI tables. Completely new tables are: IBFT, IVRS, MSCT, and WAET. Tables that are new for ACPI 4.0, but have previously been supported in ACPICA are: CPEP, BERT, EINJ, ERST, and HEST. Other newly supported tables are: UEFI and WDAT. There have been some ACPI 4.0 changes to other existing tables. Split the large actbl1.h header into the existing actbl2.h header. ACPICA BZ 774.

ACPI 4.0: Implemented predefined name validation for all new names. There are 31 new names in ACPI 4.0. The predefined validation module was split into two files. The new file is namespace/nsrepair.c. ACPICA BZ 770.

Implemented support for so-called "module-level executable code". This is executable AML code that exists outside of any control method and is intended to be executed at table load time. Although illegal since ACPI 2.0, this type of code still exists and is apparently still being created. Blocks of this code are now detected and executed as intended. Currently, the code blocks

must exist under either an If, Else, or While construct; these are the typical cases seen in the field. ACPICA BZ 762. Lin Ming.

Implemented an automatic dynamic repair for predefined names that return nested Package objects. This applies to predefined names that are defined to return a variable-length Package of sub-packages. If the number of sub-packages is one, BIOS code is occasionally seen that creates a simple single package with no sub-packages. This code attempts to fix the problem by wrapping a new package object around the existing package. These methods can be repaired: `_ALR`, `_CSD`, `_HPX`, `_MLS`, `_PRT`, `_PSS`, `_TRT`, and `_TSS`. ACPICA BZ 790.

Fixed a regression introduced in 20090625 for the `AcpiGetDevices` interface. The `_HID/_CID` matching was broken and no longer matched IDs correctly. ACPICA BZ 793.

Fixed a problem with `AcpiReset` where the reset would silently fail if the register was one of the protected I/O ports. `AcpiReset` now bypasses the port validation mechanism. This may eventually be driven into the `AcpiRead/Write` interfaces.

Fixed a regression related to the recent update of the `AcpiRead/Write` interfaces. A sleep/suspend could fail if the optional PM2 Control register does not exist during an attempt to write the Bus Master Arbitration bit. (However, some hosts already delete the code that writes this bit, and the code may in fact be obsolete at this date.) ACPICA BZ 799.

Fixed a problem where `AcpiTerminate` could fault if inadvertently called twice in succession. ACPICA BZ 795.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 84.7K Code, 17.8K Data, 102.5K Total

Debug Version: 160.5K Code, 50.6K Data, 211.1K Total

Current Release:

Non-Debug Version: 85.5K Code, 18.0K Data, 103.5K Total

Debug Version: 161.6K Code, 50.9K Data, 212.5K Total

2) iASL Compiler/Disassembler and Tools:

ACPI 4.0: Implemented disassembler support for all new ACPI tables and changes to existing tables. ACPICA BZ 775.

25 June 2009. Summary of changes for version 20090625:

The ACPI 4.0 Specification was released on June 16 and is available at www.acpi.info. ACPICA implementation of ACPI 4.0 is underway and will continue for the next few releases.

1) ACPI CA Core Subsystem:

ACPI 4.0: Implemented interpreter support for the IPMI operation region address space. Includes support for bi-directional data buffers and an IPMI address space handler (to be installed by an IPMI device driver.) ACPICA BZ 773. Lin Ming.

ACPI 4.0: Added changes for existing ACPI tables - FACS and SRAT. Includes support in both the header files and the disassembler.

Completed a major update for the AcpiGetObjectInfo external interface.

Changes include:

- Support for variable, unlimited length HID, UID, and CID strings.
- Support Processor objects the same as Devices (HID,UID,CID,ADR,STA, etc.)
- Call the _SxW power methods on behalf of a device object.
- Determine if a device is a PCI root bridge.
- Change the ACPI_BUFFER parameter to ACPI_DEVICE_INFO.

These changes will require an update to all callers of this interface. See the updated ACPICA Programmer Reference for details. One new source file has been added - utilities/utids.c. ACPICA BZ 368, 780.

Updated the AcpiRead and AcpiWrite external interfaces to support 64-bit transfers. The Value parameter has been extended from 32 bits to 64 bits in order to support new ACPI 4.0 tables. These changes will require an update to all callers of these interfaces. See the ACPICA Programmer Reference for details. ACPICA BZ 768.

Fixed several problems with AcpiAttachData. The handler was not invoked when the host node was deleted. The data sub-object was not automatically deleted when the host node was deleted. The interface to the handler had an unused parameter, this was removed. ACPICA BZ 778.

Enhanced the function that dumps ACPI table headers. All non-printable characters in the string fields are now replaced with '?' (Signature, OemId, OemTableId, and CompilerId.) ACPI tables with non-printable characters in these fields are occasionally seen in the field. ACPICA BZ 788.

Fixed a problem with predefined method repair code where the code that attempts to repair/convert an object of incorrect type is only executed on the first time the predefined method is called. The mechanism that disables warnings on subsequent calls was interfering with the repair mechanism. ACPICA BZ 781.

Fixed a possible memory leak in the predefined validation/repair code when a buffer is automatically converted to an expected string object.

Removed obsolete 16-bit files from the distribution and from the current git tree head. ACPICA BZ 776.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 83.4K Code, 17.5K Data, 100.9K Total

Debug Version: 158.9K Code, 50.0K Data, 208.9K Total

Current Release:

Non-Debug Version: 84.7K Code, 17.8K Data, 102.5K Total

Debug Version: 160.5K Code, 50.6K Data, 211.1K Total

2) iASL Compiler/Disassembler and Tools:

ACPI 4.0: iASL and Disassembler - implemented support for the new IPMI operation region keyword. ACPICA BZ 771, 772. Lin Ming.

ACPI 4.0: iASL - implemented compile-time validation support for all new predefined names and control methods (31 total). ACPICA BZ 769.

21 May 2009. Summary of changes for version 20090521:

1) ACPI CA Core Subsystem:

Disabled the preservation of the SCI enable bit in the PM1 control register. The SCI enable bit (bit 0, `SCI_EN`) is defined by the ACPI specification to be a "preserved" bit - "OSPM always preserves this bit position", section 4.7.3.2.1. However, some machines fail if this bit is in fact preserved because the bit needs to be explicitly set by the OS as a workaround. No machines fail if the bit is not preserved. Therefore, ACPICA no longer attempts to preserve this bit.

Fixed a problem in `AcpiRsGetPciRoutingTableLength` where an invalid or incorrectly formed `_PRT` package could cause a fault. Added validation to ensure that each package element is actually a sub-package.

Implemented a new interface to install or override a single control method, `AcpiInstallMethod`. This interface is useful when debugging in order to repair an existing method or to install a missing method without having to override the entire ACPI table. See the ACPICA Programmer Reference for use and

examples. Lin Ming, Bob Moore.

Fixed several reference count issues with the DdbHandle object that is created from a Load or LoadTable operator. Prevent premature deletion of the object. Also, mark the object as invalid once the table has been unloaded. This is needed because the handle itself may not be deleted after the table unload, depending on whether it has been stored in a named object by the caller. Lin Ming.

Fixed a problem with Mutex Sync Levels. Fixed a problem where if multiple mutexes of the same sync level are acquired but then not released in strict opposite order, the internally maintained Current Sync Level becomes confused and can cause subsequent execution errors. ACPICA BZ 471.

Changed the allowable release order for ASL mutex objects. The ACPI 4.0 specification has been changed to make the SyncLevel for mutex objects more useful. When releasing a mutex, the SyncLevel of the mutex must now be the same as the current sync level. This makes more sense than the previous rule (SyncLevel less than or equal). This change updates the code to match the specification.

Fixed a problem with the local version of the AcpiOsPurgeCache function. The (local) cache must be locked during all cache object deletions. Andrew Baumann.

Updated the Load operator to use operation region interfaces. This replaces direct memory mapping with region access calls. Now, all region accesses go through the installed region handler as they should.

Simplified and optimized the NsGetNextNode function. Reduced parameter count and reduced code for this frequently used function.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 82.8K Code, 17.5K Data, 100.3K Total

Debug Version: 158.0K Code, 49.9K Data, 207.9K Total

Current Release:

Non-Debug Version: 83.4K Code, 17.5K Data, 100.9K Total

Debug Version: 158.9K Code, 50.0K Data, 208.9K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: Fixed some issues with DMAR, HEST, MADT tables. Some problems with sub-table disassembly and handling invalid sub-tables. Attempt recovery

after an invalid sub-table ID.

22 April 2009. Summary of changes for version 20090422:

1) ACPI CA Core Subsystem:

Fixed a compatibility issue with the recently released I/O port protection mechanism. For windows compatibility, 1) On a port protection violation, simply ignore the request and do not return an exception (allow the control method to continue execution.) 2) If only part of the request overlaps a protected port, read/write the individual ports that are not protected. Linux BZ 13036. Lin Ming

Enhanced the execution of the ASL/AML BreakPoint operator so that it actually breaks into the AML debugger if the debugger is present. This matches the ACPI-defined behavior.

Fixed several possible warnings related to the use of the configurable ACPI_THREAD_ID. This type can now be configured as either an integer or a pointer with no warnings. Also fixes several warnings in printf-like statements for the 64-bit build when the type is configured as a pointer. ACPICA BZ 766, 767.

Fixed a number of possible warnings when compiling with gcc 4+ (depending on warning options.) Examples include printf formats, aliasing, unused globals, missing prototypes, missing switch default statements, use of non-ANSI library functions, use of non-ANSI constructs. See generate/unix/Makefile for a list of warning options used with gcc 3 and 4. ACPICA BZ 735.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 82.6K Code, 17.6K Data, 100.2K Total

Debug Version: 157.7K Code, 49.9K Data, 207.6K Total

Current Release:

Non-Debug Version: 82.8K Code, 17.5K Data, 100.3K Total

Debug Version: 158.0K Code, 49.9K Data, 207.9K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Fixed a generation warning from Bison 2.3 and fixed several warnings on the 64-bit build.

iASL: Fixed a problem where the Unix/Linux versions of the compiler could not

correctly digest Windows/DOS formatted files (with CR/LF).

iASL: Added a new option for "quiet mode" (-va) that produces only the compilation summary, not individual errors and warnings. Useful for large batch compilations.

AcpiExec: Implemented a new option (-z) to enable a forced semaphore/mutex timeout that can be used to detect hang conditions during execution of AML code (includes both internal semaphores and AML-defined mutexes and events.)

Added new makefiles for the generation of acpica in a generic unix-like environment. These makefiles are intended to generate the acpica tools and utilities from the original acpica git source tree structure.

Test Suites: Updated and cleaned up the documentation files. Updated the copyrights to 2009, affecting all source files. Use the new version of iASL with quiet mode. Increased the number of available semaphores in the Windows OSL, allowing the aslts to execute fully on Windows. For the Unix OSL, added an alternate implementation of the semaphore timeout to allow aslts to execute fully on Cygwin.

20 March 2009. Summary of changes for version 20090320:

1) ACPI CA Core Subsystem:

Fixed a possible race condition between AcpiWalkNamespace and dynamic table unloads. Added a reader/writer locking mechanism to allow multiple concurrent namespace walks (readers), but block a dynamic table unload until it can gain exclusive write access to the namespace. This fixes a problem where a table unload could (possibly catastrophically) delete the portion of the namespace that is currently being examined by a walk. Adds a new file, utlock.c, that implements the reader/writer lock mechanism. ACPICA BZ 749.

Fixed a regression introduced in version 20090220 where a change to the FADT handling could cause the ACPICA subsystem to access non-existent I/O ports.

Modified the handling of FADT register and table (FACS/DSDT) addresses. The FADT can contain both 32-bit and 64-bit versions of these addresses.

Previously, the 64-bit versions were favored, meaning that if both 32 and 64 versions were valid, but not equal, the 64-bit version was used. This was found to cause some machines to fail. Now, in this case, the 32-bit version is used instead. This now matches the Windows behavior.

Implemented a new mechanism to protect certain I/O ports. Provides Microsoft compatibility and protects the standard PC I/O ports from access via AML code. Adds a new file, hwvalid.c

Fixed a possible extraneous warning message from the FADT support. The message warns of a 32/64 length mismatch between the legacy and GAS definitions for a register.

Removed the obsolete AcpiOsValidateAddress OSL interface. This interface is made obsolete by the port protection mechanism above. It was previously used to validate the entire address range of an operation region, which could be incorrect if the range included illegal ports, but fields within the operation region did not actually access those ports. Validation is now performed on a per-field basis instead of the entire region.

Modified the handling of the PM1 Status Register ignored bit (bit 11.) Ignored bits must be "preserved" according to the ACPI spec. Usually, this means a read/modify/write when writing to the register. However, for status registers, writing a one means clear the event. Writing a zero means preserve the event (do not clear.) This behavior is clarified in the ACPI 4.0 spec, and the ACPICA code now simply always writes a zero to the ignored bit.

Modified the handling of ignored bits for the PM1 A/B Control Registers. As per the ACPI specification, for the control registers, preserve (read/modify/write) all bits that are defined as either reserved or ignored.

Updated the handling of write-only bits in the PM1 A/B Control Registers. When reading the register, zero the write-only bits as per the ACPI spec. ACPICA BZ 443. Lin Ming.

Removed "Linux" from the list of supported _OSI strings. Linux no longer wants to reply true to this request. The Windows strings are the only paths through the AML that are tested and known to work properly.

Previous Release:

Non-Debug Version: 82.0K Code, 17.5K Data, 99.5K Total

Debug Version: 156.9K Code, 49.8K Data, 206.7K Total

Current Release:

Non-Debug Version: 82.6K Code, 17.6K Data, 100.2K Total

Debug Version: 157.7K Code, 49.9K Data, 207.6K Total

2) iASL Compiler/Disassembler and Tools:

Acpiexec: Split the large aeexec.c file into two new files, aehandlers.c and aetables.c

20 February 2009. Summary of changes for version 20090220:

1) ACPI CA Core Subsystem:

Optimized the ACPI register locking. Removed locking for reads from the ACPI

bit registers in PM1 Status, Enable, Control, and PM2 Control. The lock is not required when reading the single-bit registers. The `AcpiGetRegisterUnlocked` function is no longer needed and has been removed. This will improve performance for reads on these registers. ACPICA BZ 760.

Fixed the parameter validation for `AcpiRead/Write`. Now return `AE_BAD_PARAMETER` if the input register pointer is null, and `AE_BAD_ADDRESS` if the register has an address of zero. Previously, these cases simply returned `AE_OK`. For optional registers such as PM1B status/enable/control, the caller should check for a valid register address before calling. ACPICA BZ 748.

Renamed the external ACPI bit register access functions. Renamed `AcpiGetRegister` and `AcpiSetRegister` to clarify the purpose of these functions. The new names are `AcpiReadBitRegister` and `AcpiWriteBitRegister`. Also, restructured the code for these functions by simplifying the code path and condensing duplicate code to reduce code size.

Added new functions to transparently handle the possibly split PM1 A/B registers. `AcpiHwReadMultiple` and `AcpiHwWriteMultiple`. These two functions now handle the split registers for PM1 Status, Enable, and Control. ACPICA BZ 746.

Added a function to handle the PM1 control registers, `AcpiHwWritePm1Control`. This function writes both of the PM1 control registers (A/B). These registers are different than the PM1 A/B status and enable registers in that different values can be written to the A/B registers. Most notably, the `SLP_TYP` bits can be different, as per the values returned from the `_Sx` predefined methods.

Removed an extra register write within `AcpiHwClearAcpiStatus`. This function was writing an optional PM1B status register twice. The existing call to the low-level `AcpiHwRegisterWrite` automatically handles a possibly split PM1 A/B register. ACPICA BZ 751.

Split out the PM1 Status registers from the FADT. Added new globals for these registers (A/B), similar to the way the PM1 Enable registers are handled. Instead of overloading the FADT Event Register blocks. This makes the code clearer and less prone to error.

Fixed the warning message for when the platform contains too many ACPI tables for the default size of the global root table data structure. The calculation for the truncation value was incorrect.

Removed the `ACPI_GET_OBJECT_TYPE` macro. Removed all instances of this obsolete macro, since it is now a simple reference to `->common.type`. There were about 150 invocations of the macro across 41 files. ACPICA BZ 755.

Removed the redundant `ACPI_BITREG_SLEEP_TYPE_B`. This type is the same as `TYPE_A`. Removed this and all related instances. Renamed `SLEEP_TYPE_A` to

simply SLEEP_TYPE. ACPICA BZ 754.

Conditionally compile the AcpiSetFirmwareWakingVector64 function. This function is only needed on 64-bit host operating systems and is thus not included for 32-bit hosts.

Debug output: print the input and result for invocations of the _OSI reserved control method via the ACPI_LV_INFO debug level. Also, reduced some of the verbosity of this debug level. Len Brown.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 82.3K Code, 17.5K Data, 99.8K Total

Debug Version: 157.3K Code, 49.8K Data, 207.1K Total

Current Release:

Non-Debug Version: 82.0K Code, 17.5K Data, 99.5K Total

Debug Version: 156.9K Code, 49.8K Data, 206.7K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: Decode the FADT PM_Profile field. Emit ascii names for the various legal performance profiles.

23 January 2009. Summary of changes for version 20090123:

1) ACPI CA Core Subsystem:

Added the 2009 copyright to all module headers and signons. This affects virtually every file in the ACPICA core subsystem, the iASL compiler, and the tools/utilities.

Implemented a change to allow the host to override any ACPI table, including dynamically loaded tables. Previously, only the DSDT could be replaced by the host. With this change, the AcpiOsTableOverride interface is called for each table found in the RSDT/XSDT during ACPICA initialization, and also whenever a table is dynamically loaded via the AML Load operator.

Updated FADT flag definitions, especially the Boot Architecture flags.

Debugger: For the Find command, automatically pad the input ACPI name with underscores if the name is shorter than 4 characters. This enables a match with the actual namespace entry which is itself padded with underscores.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 82.3K Code, 17.4K Data, 99.7K Total

Debug Version: 157.1K Code, 49.7K Data, 206.8K Total

Current Release:

Non-Debug Version: 82.3K Code, 17.5K Data, 99.8K Total

Debug Version: 157.3K Code, 49.8K Data, 207.1K Total

2) iASL Compiler/Disassembler and Tools:

Fix build error under Bison-2.4.

Disassembler: Enhanced FADT support. Added decoding of the Boot Architecture flags. Now decode all flags, regardless of the FADT version. Flag output includes the FADT version which first defined each flag.

The iASL -g option now dumps the RSDT to a file (in addition to the FADT and DSDT). Windows only.

04 December 2008. Summary of changes for version 20081204:

1) ACPI CA Core Subsystem:

The ACPI CA Programmer Reference has been completely updated and revamped for this release. This includes updates to the external interfaces, OSL interfaces, the overview sections, and the debugger reference.

Several new ACPI CA interfaces have been implemented and documented in the programmer reference:

`AcpiReset` - Writes the reset value to the FADT-defined reset register.

`AcpiDisableAllGpes` - Disable all available GPEs.

`AcpiEnableAllRuntimeGpes` - Enable all available runtime GPEs.

`AcpiGetGpeDevice` - Get the GPE block device associated with a GPE.

`AcpiGbl_CurrentGpeCount` - Tracks the current number of available GPEs.

`AcpiRead` - Low-level read ACPI register (was `HwLowLevelRead`.)

`AcpiWrite` - Low-level write ACPI register (was `HwLowLevelWrite`.)

Most of the public ACPI hardware-related interfaces have been moved to a new file, `components/hardware/hwxface.c`

Enhanced the FADT parsing and low-level ACPI register access: The ACPI register lengths within the FADT are now used, and the low level ACPI register access no longer hardcodes the ACPI register lengths. Given that

there may be some risk in actually trusting the FADT register lengths, a runtime option was added to fall back to the default hardcoded lengths if the FADT proves to contain incorrect values - UseDefaultRegisterWidths. This option is set to true for now, and a warning is issued if a suspicious FADT register length is overridden with the default value.

Fixed a reference count issue in NsRepairObject. This problem was introduced in version 20081031 as part of a fix to repair Buffer objects within Packages. Lin Ming.

Added semaphore support to the Linux/Unix application OS-services layer (OSL). ACPICA BZ 448. Lin Ming.

Added the ACPI_MUTEX_TYPE configuration option to select whether mutexes will be implemented in the OSL, or will binary semaphores be used instead.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 81.7K Code, 17.3K Data, 99.0K Total

Debug Version: 156.4K Code, 49.4K Data, 205.8K Total

Current Release:

Non-Debug Version: 82.3K Code, 17.4K Data, 99.7K Total

Debug Version: 157.1K Code, 49.7K Data, 206.8K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Completed the '-e' option to include additional ACPI tables in order to aid with disassembly and External statement generation. ACPICA BZ 742. Lin Ming.

iASL: Removed the "named object in while loop" error. The compiler cannot determine how many times a loop will execute. ACPICA BZ 730.

Disassembler: Implemented support for FADT revision 2 (MS extension). ACPICA BZ 743.

Disassembler: Updates for several ACPI data tables (HEST, EINJ, and MCFG).

31 October 2008. Summary of changes for version 20081031:

1) ACPI CA Core Subsystem:

Restructured the ACPICA header files into public/private. acpi.h now includes

only the "public" acpica headers. All other acpica headers are "private" and should not be included by acpica users. One new file, accommon.h is used to include the commonly used private headers for acpica code generation. Future plans include moving all private headers to a new subdirectory.

Implemented an automatic Buffer->String return value conversion for predefined ACPI methods. For these methods (such as `_BIF`), added automatic conversion for return objects that are required to be a String, but a Buffer was found instead. This can happen when reading string battery data from an operation region, because it used to be difficult to convert the data from buffer to string from within the ASL. Ensures that the host OS is provided with a valid null-terminated string. Linux BZ 11822.

Updated the FACS waking vector interfaces. Split `AcpiSetFirmwareWakingVector` into two: one for the 32-bit vector, another for the 64-bit vector. This is required because the host OS must setup the wake much differently for each vector (real vs. protected mode, etc.) and the interface itself should not be deciding which vector to use. Also, eliminated the `GetFirmwareWakingVector` interface, as it served no purpose (only the firmware reads the vector, OS only writes the vector.) ACPICA BZ 731.

Implemented a mechanism to escape infinite AML `While()` loops. Added a loop counter to force exit from AML `While` loops if the count becomes too large. This can occur in poorly written AML when the hardware does not respond within a while loop and the loop does not implement a timeout. The maximum loop count is configurable. A new exception code is returned when a loop is broken, `AE_AML_INFINITE_LOOP`. Alexey Starikovskiy, Bob Moore.

Optimized the execution of AML `While` loops. Previously, a control state object was allocated and freed for each execution of the loop. The optimization is to simply reuse the control state for each iteration. This speeds up the raw loop execution time by about 5%.

Enhanced the implicit return mechanism. For Windows compatibility, return an implicit integer of value zero for methods that contain no executable code. Such methods are seen in the field as stubs (presumably), and can cause drivers to fail if they expect a return value. Lin Ming.

Allow multiple backslashes as root prefixes in namepaths. In a fully qualified namepath, allow multiple backslash prefixes. This can happen (and is seen in the field) because of the use of a double-backslash in strings (since backslash is the escape character) causing confusion. ACPICA BZ 739
Lin Ming.

Emit a warning if two different FACS or DSDT tables are discovered in the FADT. Checks if there are two valid but different addresses for the FACS and DSDT within the FADT (mismatch between the 32-bit and 64-bit fields.)

Consolidated the method argument count validation code. Merged the code that validates control method argument counts into the predefined validation module. Eliminates possible multiple warnings for incorrect argument counts.

Implemented ACPICA example code. Includes code for ACPICA initialization, handler installation, and calling a control method. Available at <source/tools/examples>.

Added a global pointer for FACS table to simplify internal FACS access. Use the global pointer instead of using `AcpiGetTableByIndex` for each FACS access. This simplifies the code for the Global Lock and the Firmware Waking Vector(s).

Example Code and Data Size: These are the sizes for the OS-independent `apica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 81.2K Code, 17.0K Data, 98.2K Total

Debug Version: 155.8K Code, 49.1K Data, 204.9K Total

Current Release:

Non-Debug Version: 81.7K Code, 17.3K Data, 99.0K Total

Debug Version: 156.4K Code, 49.4K Data, 205.8K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Improved disassembly of external method calls. Added the `-e` option to allow the inclusion of additional ACPI tables to help with the disassembly of method invocations and the generation of external declarations during the disassembly. Certain external method invocations cannot be disassembled properly without the actual declaration of the method. Use the `-e` option to include the table where the external method(s) are actually declared. Most useful for disassembling SSDTs that make method calls back to the master DSDT. Lin Ming. Example: To disassemble an SSDT with calls to DSDT: `iasl -d -e dsdt.aml ssdt1.aml`

iASL: Fix to allow references to aliases within ASL namepaths. Fixes a problem where the use of an alias within a namepath would result in a not found error or cause the compiler to fault. Also now allows forward references from the Alias operator itself. ACPICA BZ 738.

26 September 2008. Summary of changes for version 20080926:

1) ACPI CA Core Subsystem:

Designed and implemented a mechanism to validate predefined ACPI methods and

objects. This code validates the predefined ACPI objects (objects whose names start with underscore) that appear in the namespace, at the time they are evaluated. The argument count and the type of the returned object are validated against the ACPI specification. The purpose of this validation is to detect problems with the BIOS-implemented predefined ACPI objects before the results are returned to the ACPI-related drivers. Future enhancements may include actual repair of incorrect return objects where possible. Two new files are `nspredef.c` and `acpredef.h`.

Fixed a fault in the AML parser if a memory allocation fails during the `Op` completion routine `AcpiPsCompleteThisOp`. Lin Ming. ACPICA BZ 492.

Fixed an issue with implicit return compatibility. This change improves the implicit return mechanism to be more compatible with the MS interpreter. Lin Ming, ACPICA BZ 349.

Implemented support for zero-length buffer-to-string conversions. Allow zero length strings during interpreter buffer-to-string conversions. For example, during the `ToDecimalString` and `ToHexString` operators, as well as implicit conversions. Fiodor Suietov, ACPICA BZ 585.

Fixed two possible memory leaks in the error exit paths of `AcpiUtUpdateObjectReference` and `AcpiUtWalkPackageTree`. These functions are similar in that they use a stack of state objects in order to eliminate recursion. The stack must be fully unwound and deallocated if an error occurs. Lin Ming. ACPICA BZ 383.

Removed the unused `ACPI_BITREG_WAKE_ENABLE` definition and entry in the global ACPI register table. This bit does not exist and is unused. Lin Ming, Bob Moore ACPICA BZ 442.

Removed the obsolete version number in module headers. Removed the "\$Revision" number that appeared in each module header. This version number was useful under SourceSafe and CVS, but has no meaning under git. It is not only incorrect, it could also be misleading.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.7K Code, 16.4K Data, 96.1K Total

Debug Version: 153.7K Code, 48.2K Data, 201.9K Total

Current Release:

Non-Debug Version: 81.2K Code, 17.0K Data, 98.2K Total

Debug Version: 155.8K Code, 49.1K Data, 204.9K Total

29 August 2008. Summary of changes for version 20080829:

1) ACPI CA Core Subsystem:

Completed a major cleanup of the internal ACPI_OPERAND_OBJECT of type Reference. Changes include the elimination of cheating on the Object field for the DdbHandle subtype, addition of a reference class field to differentiate the various reference types (instead of an AML opcode), and the cleanup of debug output for this object. Lin Ming, Bob Moore. BZ 723

Reduce an error to a warning for an incorrect method argument count. Previously aborted with an error if too few arguments were passed to a control method via the external ACPICA interface. Now issue a warning instead and continue. Handles the case where the method inadvertently declares too many arguments, but does not actually use the extra ones. Applies mainly to the predefined methods. Lin Ming. Linux BZ 11032.

Disallow the evaluation of named object types with no intrinsic value. Return AE_TYPE for objects that have no value and therefore evaluation is undefined: Device, Event, Mutex, Region, Thermal, and Scope. Previously, evaluation of these types were allowed, but an exception would be generated at some point during the evaluation. Now, the error is generated up front.

Fixed a possible memory leak in the AcpiNsGetExternalPathname function (nsnames.c). Fixes a leak in the error exit path.

Removed the obsolete debug levels ACPI_DB_WARN and ACPI_DB_ERROR. These debug levels were made obsolete by the ACPI_WARNING, ACPI_ERROR, and ACPI_EXCEPTION interfaces. Also added ACPI_DB_EVENTS to correspond with the existing ACPI_LV_EVENTS.

Removed obsolete and/or unused exception codes from the acexcep.h header. There is the possibility that certain device drivers may be affected if they use any of these exceptions.

The ACPICA documentation has been added to the public git source tree, under apica/documents. Included are the ACPICA programmer reference, the iASL compiler reference, and the changes.txt release logfile.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.7K Code, 16.4K Data, 96.1K Total

Debug Version: 153.9K Code, 48.4K Data, 202.3K Total

Current Release:

Non-Debug Version: 79.7K Code, 16.4K Data, 96.1K Total

Debug Version: 153.7K Code, 48.2K Data, 201.9K Total

2) iASL Compiler/Disassembler and Tools:

Allow multiple argument counts for the predefined `_SCP` method. ACPI 3.0 defines `_SCP` with 3 arguments. Previous versions defined it with only 1 argument. iASL now allows both definitions.

iASL/disassembler: avoid infinite loop on bad ACPI tables. Check for zero-length subtables when disassembling ACPI tables. Also fixed a couple of errors where a full 16-bit table type field was not extracted from the input properly.

acpisrc: Improve comment counting mechanism for generating source code statistics. Count first and last lines of multi-line comments as whitespace, not comment lines. Handle Linux legal header in addition to standard acpica header.

29 July 2008. Summary of changes for version 20080729:

1) ACPI CA Core Subsystem:

Fix a possible deadlock in the GPE dispatch. Remove call to `AcpiHwDisableAllGpes` during wake in `AcpiEvGpeDispatch`. This call will attempt to acquire the GPE lock but can deadlock since the GPE lock is already held at dispatch time. This code was introduced in version 20060831 as a response to Linux BZ 6881 and has since been removed from Linux.

Add a function to dereference returned reference objects. Examines the return object from a call to `AcpiEvaluateObject`. Any `Index` or `RefOf` references are automatically dereferenced in an attempt to return something useful (these reference types cannot be converted into an external `ACPI_OBJECT`.) Provides MS compatibility. Lin Ming, Bob Moore. Linux BZ 11105

x2APIC support: changes for MADT and SRAT ACPI tables. There are 2 new subtables for the MADT and one new subtable for the SRAT. Includes disassembler and `AcpiSrc` support. Data from the Intel 64 Architecture x2APIC Specification, June 2008.

Additional error checking for pathname utilities. Add error check after all calls to `AcpiNsGetPathnameLength`. Add status return from `AcpiNsBuildExternalPath` and check after all calls. Add parameter validation to `AcpiUtInitializeBuffer`. Reported by and initial patch by Ingo Molnar.

Return status from the global init function `AcpiUtGlobalInitialize`. This is used by both the kernel subsystem and the utilities such as iASL compiler. The function could possibly fail when the caches are initialized. Yang Yi.

Add a function to decode reference object types to strings. Created for improved error messages.

Improve object conversion error messages. Better error messages during object conversion from internal to the external `ACPI_OBJECT`. Used for external calls to `AcpiEvaluateObject`.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.6K Code, 16.2K Data, 95.8K Total

Debug Version: 153.5K Code, 48.2K Data, 201.7K Total

Current Release:

Non-Debug Version: 79.7K Code, 16.4K Data, 96.1K Total

Debug Version: 153.9K Code, 48.4K Data, 202.3K Total

2) iASL Compiler/Disassembler and Tools:

Debugger: fix a possible hang when evaluating non-methods. Fixes a problem introduced in version 20080701. If the object being evaluated (via `execute` command) is not a method, the debugger can hang while trying to obtain non-existent parameters.

iASL: relax error for using reserved "_T_x" identifiers. These names can appear in a disassembled ASL file if they were emitted by the original compiler. Instead of issuing an error or warning and forcing the user to manually change these names, issue a remark instead.

iASL: error if named object created in while loop. Emit an error if any named object is created within a `While` loop. If allowed, this code will generate a run-time error on the second iteration of the loop when an attempt is made to create the same named object twice. ACPICA bugzilla 730.

iASL: Support absolute pathnames for include files. Add support for absolute pathnames within the `Include` operator. previously, only relative pathnames were supported.

iASL: Enforce minimum 1 interrupt in interrupt macro and Resource Descriptor. The ACPI spec requires one interrupt minimum. BZ 423

iASL: Handle a missing `ResourceSource` arg, with a present `SourceIndex`.

Handles the case for the Interrupt Resource Descriptor where the ResourceSource argument is omitted but ResourceSourceIndex is present. Now leave room for the Index. BZ 426

iASL: Prevent error message if CondRefOf target does not exist. Fixes cases where an error message is emitted if the target does not exist. BZ 516

iASL: Fix broken -g option (get Windows ACPI tables). Fixes the -g option (get ACPI tables on Windows). This was apparently broken in version 20070919.

AcpiXtract: Handle EOF while extracting data. Correctly handle the case where the EOF happens immediately after the last table in the input file. Print completion message. Previously, no message was displayed in this case.

01 July 2008. Summary of changes for version 20080701:

0) Git source tree / acpica.org

Fixed a problem where a git-clone from http would not transfer the entire source tree.

1) ACPI CA Core Subsystem:

Implemented a "careful" GPE disable in AcpiEvDisableGpe, only modify one enable bit. Now performs a read-change-write of the enable register instead of simply writing out the cached enable mask. This will prevent inadvertent enabling of GPEs if a rogue GPE is received during initialization (before GPE handlers are installed.)

Implemented a copy for dynamically loaded tables. Previously, dynamically loaded tables were simply mapped - but on some machines this memory is corrupted after suspend. Now copy the table to a local buffer. For the OpRegion case, added checksum verify. Use the table length from the table header, not the region length. For the Buffer case, use the table length also. Dennis Noordsij, Bob Moore. BZ 10734

Fixed a problem where the same ACPI table could not be dynamically loaded and unloaded more than once. Without this change, a table cannot be loaded again once it has been loaded/unloaded one time. The current mechanism does not unregister a table upon an unload. During a load, if the same table is found, this no longer returns an exception. BZ 722

Fixed a problem where the wrong descriptor length was calculated for the EndTag descriptor in 64-bit mode. The "minimal" descriptors such as EndTag are calculated as 12 bytes long, but the actual length in the internal descriptor is 16 because of the round-up to 8 on the 64-bit build. Reported by Linn Crosetto. BZ 728

Fixed a possible memory leak in the Unload operator. The DdbHandle returned by Load() did not have its reference count decremented during unload, leading to a memory leak. Lin Ming. BZ 727

Fixed a possible memory leak when deleting thermal/processor objects. Any associated notify handlers (and objects) were not being deleted. Fiodor Suietov. BZ 506

Fixed the ordering of the ASCII names in the global mutex table to match the actual mutex IDs. Used by AcpiUtGetMutexName, a function used for debug only. Vegard Nossun. BZ 726

Enhanced the AcpiGetObjectInfo interface to return the number of required arguments if the object is a control method. Added this call to the debugger so the proper number of default arguments are passed to a method. This prevents a warning when executing methods from AcpiExec.

Added a check for an invalid handle in AcpiGetObjectInfo. Return AE_BAD_PARAMETER if input handle is invalid. BZ 474

Fixed an extraneous warning from exconfig.c on the 64-bit build.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.3K Code, 16.2K Data, 95.5K Total

Debug Version: 153.0K Code, 48.2K Data, 201.2K Total

Current Release:

Non-Debug Version: 79.6K Code, 16.2K Data, 95.8K Total

Debug Version: 153.5K Code, 48.2K Data, 201.7K Total

2) iASL Compiler/Disassembler and Tools:

iASL: Added two missing ACPI reserved names. Added _MTP and _ASZ, both resource descriptor names.

iASL: Detect invalid ASCII characters in input (windows version). Removed the "-CF" flag from the flex compile, enables correct detection of non-ASCII characters in the input. BZ 441

iASL: Eliminate warning when result of LoadTable is not used. Eliminate the "result of operation not used" warning when the DDB handle returned from LoadTable is not used. The warning is not needed. BZ 590

AcpiExec: Add support for dynamic table load/unload. Now calls _CFG method to pass address of table to the AML. Added option to disable OpRegion simulation to allow creation of an OpRegion with a real address that was passed to _CFG. All of this allows testing of the Load and Unload operators from AcpiExec.

Debugger: update tables command for unloaded tables. Handle unloaded tables and use the standard table header output routine.

09 June 2008. Summary of changes for version 20080609:

1) ACPI CA Core Subsystem:

Implemented a workaround for reversed _PRT entries. A significant number of BIOSs erroneously reverse the _PRT SourceName and the SourceIndex. This change dynamically detects and repairs this problem. Provides compatibility with MS ACPI. BZ 6859

Simplified the internal ACPI hardware interfaces to eliminate the locking flag parameter from Register Read/Write. Added a new external interface, AcpiGetRegisterUnlocked.

Fixed a problem where the invocation of a GPE control method could hang. This was a regression introduced in 20080514. The new method argument count validation mechanism can enter an infinite loop when a GPE method is dispatched. Problem fixed by removing the obsolete code that passed GPE block information to the notify handler via the control method parameter pointer.

Fixed a problem where the _SST execution status was incorrectly returned to the caller of AcpiEnterSleepStatePrep. This was a regression introduced in 20080514. _SST is optional and a NOT_FOUND exception should never be returned. BZ 716

Fixed a problem where a deleted object could be accessed from within the AML parser. This was a regression introduced in version 20080123 as a fix for the Unload operator. Lin Ming. BZ 10669

Cleaned up the debug operand dump mechanism. Eliminated unnecessary operands and eliminated the use of a negative index in a loop. Operands are now displayed in the correct order, not backwards. This also fixes a regression introduced in 20080514 on 64-bit systems where the elimination of ACPI_NATIVE_UINT caused the negative index to go large and positive. BZ 715

Fixed a possible memory leak in EvPciConfigRegionSetup where the error exit path did not delete a locally allocated structure.

Updated definitions for the DMAR and SRAT tables to synchronize with the current specifications. Includes disassembler support.

Fixed a problem in the mutex debug code (in utmutex.c) where an incorrect loop termination value was used. Loop terminated on iteration early, missing one mutex. Linn Crosetto

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.5K Code, 16.2K Data, 95.7K Total

Debug Version: 153.3K Code, 48.3K Data, 201.6K Total

Current Release:

Non-Debug Version: 79.3K Code, 16.2K Data, 95.5K Total

Debug Version: 153.0K Code, 48.2K Data, 201.2K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: Implemented support for EisaId() within _CID objects. Now disassemble integer _CID objects back to EisaId invocations, including multiple integers within _CID packages. Includes single-step support for debugger also.

Disassembler: Added support for DMAR and SRAT table definition changes.

14 May 2008. Summary of changes for version 20080514:

1) ACPI CA Core Subsystem:

Fixed a problem where GPEs were enabled too early during the ACPICA initialization. This could lead to "handler not installed" errors on some machines. Moved GPE enable until after _REG/_STA/_INI methods are run. This ensures that all operation regions and devices throughout the namespace have been initialized before GPEs are enabled. Alexey Starikovskiy, BZ 9916.

Implemented a change to the enter sleep code. Moved execution of the _GTS method to just before setting sleep enable bit. The execution was moved from AcpiEnterSleepStatePrep to AcpiEnterSleepState. _GTS is now executed immediately before the SLP_EN bit is set, as per the ACPI specification. Luming Yu, BZ 1653.

Implemented a fix to disable unknown GPEs (2nd version). Now always disable the GPE, even if ACPICA thinks that that it is already disabled. It is possible that the AML or some other code has enabled the GPE unbeknownst to the ACPICA code.

Fixed a problem with the Field operator where zero-length fields would return an AE_AML_NO_OPERAND exception during table load. Fix enables zero-length ASL field declarations in Field(), BankField(), and IndexField(). BZ 10606.

Implemented a fix for the Load operator, now load the table at the namespace root. This reverts a change introduced in version 20071019. The table is now loaded at the namespace root even though this goes against the ACPI specification. This provides compatibility with other ACPI implementations. The ACPI specification will be updated to reflect this in ACPI 4.0. Lin Ming.

Fixed a problem where ACPICA would not Load() tables with unusual signatures. Now ignore ACPI table signature for Load() operator. Only "SSDT" is acceptable to the ACPI spec, but tables are seen with OEMx and null sigs. Therefore, signature validation is worthless. Apparently MS ACPI accepts such signatures, ACPICA must be compatible. BZ 10454.

Fixed a possible negative array index in AcpiUtValidateException. Added NULL fields to the exception string arrays to eliminate a -1 subtraction on the SubStatus field.

Updated the debug tracking macros to reduce overall code and data size. Changed ACPI_MODULE_NAME and ACPI_FUNCTION_NAME to use arrays of strings instead of pointers to static strings. Jan Beulich and Bob Moore.

Implemented argument count checking in control method invocation via AcpiEvaluateObject. Now emit an error if too few arguments, warning if too many. This applies only to extern programmatic control method execution, not method-to-method calls within the AML. Lin Ming.

Eliminated the ACPI_NATIVE_UINT type across all ACPICA code. This type is no longer needed, especially with the removal of 16-bit support. It was replaced mostly with UINT32, but also ACPI_SIZE where a type that changes 32/64 bit on 32/64-bit platforms is required.

Added the C const qualifier for appropriate string constants -- mostly MODULE_NAME and printf format strings. Jan Beulich.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.0K Code, 17.4K Data, 97.4K Total

Debug Version: 159.4K Code, 64.4K Data, 223.8K Total

Current Release:

Non-Debug Version: 79.5K Code, 16.2K Data, 95.7K Total

Debug Version: 153.3K Code, 48.3K Data, 201.6K Total

2) iASL Compiler/Disassembler and Tools:

Implemented ACPI table revision ID validation in the disassembler. Zero is always invalid. For DSDTs, the ID controls the interpreter integer width. 1 means 32-bit and this is unusual. 2 or greater is 64-bit.

21 March 2008. Summary of changes for version 20080321:

1) ACPI CA Core Subsystem:

Implemented an additional change to the GPE support in order to suppress spurious or stray GPEs. The AcpiEvDisableGpe function will now permanently disable incoming GPEs that are neither enabled nor disabled -- meaning that the GPE is unknown to the system. This should prevent future interrupt floods from that GPE. BZ 6217 (Zhang Rui)

Fixed a problem where NULL package elements were not returned to the AcpiEvaluateObject interface correctly. The element was simply ignored instead of returning a NULL ACPI_OBJECT package element, potentially causing a buffer overflow and/or confusing the caller who expected a fixed number of elements. BZ 10132 (Lin Ming, Bob Moore)

Fixed a problem with the CreateField, CreateXXXField (Bit, Byte, Word, Dword, Qword), Field, BankField, and IndexField operators when invoked from inside an executing control method. In this case, these operators created namespace nodes that were incorrectly left marked as permanent nodes instead of temporary nodes. This could cause a problem if there is race condition between an exiting control method and a running namespace walk. (Reported by Linn Crosetto)

Fixed a problem where the CreateField and CreateXXXField operators would incorrectly allow duplicate names (the name of the field) with no exception generated.

Implemented several changes for Notify handling. Added support for new Notify values (ACPI 2.0+) and improved the Notify debug output. Notify on PowerResource objects is no longer allowed, as per the ACPI specification. (Bob Moore, Zhang Rui)

All Reference Objects returned via the AcpiEvaluateObject interface are now marked as type "REFERENCE" instead of "ANY". The type ANY is now reserved for NULL objects - either NULL package elements or unresolved named references.

Fixed a problem where an extraneous debug message was produced for package objects (when debugging enabled). The message "Package List length larger than NumElements count" is now produced in the correct case, and is now an

error message rather than a debug message. Added a debug message for the opposite case, where NumElements is larger than the Package List (the package will be padded out with NULL elements as per the ACPI spec.)

Implemented several improvements for the output of the ASL "Debug" object to clarify and keep all data for a given object on one output line.

Fixed two size calculation issues with the variable-length Start Dependent resource descriptor.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.7K Code, 17.3K Data, 97.0K Total

Debug Version: 158.9K Code, 64.0K Data, 222.9K Total

Current Release:

Non-Debug Version: 80.0K Code, 17.4K Data, 97.4K Total

Debug Version: 159.4K Code, 64.4K Data, 223.8K Total

2) iASL Compiler/Disassembler and Tools:

Fixed a problem with the use of the Switch operator where execution of the containing method by multiple concurrent threads could cause an AE_ALREADY_EXISTS exception. This is caused by the fact that there is no actual Switch opcode, it must be simulated with local named temporary variables and if/else pairs. The solution chosen was to mark any method that uses Switch as Serialized, thus preventing multiple thread entries. BZ 469.

13 February 2008. Summary of changes for version 20080213:

1) ACPI CA Core Subsystem:

Implemented another MS compatibility design change for GPE/Notify handling. GPEs are now cleared/enabled asynchronously to allow all pending notifies to complete first. It is expected that the OSL will queue the enable request behind all pending notify requests (may require changes to the local host OSL in AcpiOsExecute). Alexey Starikovskiy.

Fixed a problem where buffer and package objects passed as arguments to a control method via the external AcpiEvaluateObject interface could cause an AE_AML_INTERNAL exception depending on the order and type of operators executed by the target control method.

Fixed a problem where resource descriptor size optimization could cause a

problem when a `_CRS` resource template is passed to a `_SRS` method. The `_SRS` resource template must use the same descriptors (with the same size) as returned from `_CRS`. This change affects the following resource descriptors: `IRQ / IRQNoFlags` and `StartDependentFn / StartDependentFnNoPri`. (BZ 9487)

Fixed a problem where a `CopyObject` to `RegionField`, `BankField`, and `IndexField` objects did not perform an implicit conversion as it should. These types must retain their initial type permanently as per the ACPI specification. However, a `CopyObject` to all other object types should not perform an implicit conversion, as per the ACPI specification. (Lin Ming, Bob Moore) BZ 388

Fixed a problem with the `AcpiGetDevices` interface where the mechanism to match device CIDs did not examine the entire list of available CIDs, but instead aborted on the first non-matching CID. Andrew Patterson.

Fixed a regression introduced in version 20071114. The `ACPI_HIDWORD` macro was inadvertently changed to return a 16-bit value instead of a 32-bit value, truncating the upper dword of a 64-bit value. This macro is only used to display debug output, so no incorrect calculations were made. Also, reimplemented the macro so that a 64-bit shift is not performed by inefficient compilers.

Added missing `va_end` statements that should correspond with each `va_start` statement.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.5K Code, 17.2K Data, 96.7K Total

Debug Version: 159.0K Code, 63.8K Data, 222.8K Total

Current Release:

Non-Debug Version: 79.7K Code, 17.3K Data, 97.0K Total

Debug Version: 158.9K Code, 64.0K Data, 222.9K Total

2) iASL Compiler/Disassembler and Tools:

Implemented full disassembler support for the following new ACPI tables: BERT, EINJ, and ERST. Implemented partial disassembler support for the complicated HEST table. These tables support the Windows Hardware Error Architecture (WHEA).

23 January 2008. Summary of changes for version 20080123:

1) ACPI CA Core Subsystem:

Added the 2008 copyright to all module headers and signons. This affects virtually every file in the ACPI core subsystem, the iASL compiler, and the tools/utilities.

Fixed a problem with the SizeOf operator when used with Package and Buffer objects. These objects have deferred execution for some arguments, and the execution is now completed before the SizeOf is executed. This problem caused unexpected AE_PACKAGE_LIMIT errors on some systems (Lin Ming, Bob Moore) BZ 9558

Implemented an enhancement to the interpreter "slack mode". In the absence of an explicit return or an implicitly returned object from the last executed opcode, a control method will now implicitly return an integer of value 0 for Microsoft compatibility. (Lin Ming) BZ 392

Fixed a problem with the Load operator where an exception was not returned in the case where the table is already loaded. (Lin Ming) BZ 463

Implemented support for the use of DDBHandles as an Indexed Reference, as per the ACPI spec. (Lin Ming) BZ 486

Implemented support for UserTerm (Method invocation) for the Unload operator as per the ACPI spec. (Lin Ming) BZ 580

Fixed a problem with the LoadTable operator where the OemId and OemTableId input strings could cause unexpected failures if they were shorter than the maximum lengths allowed. (Lin Ming, Bob Moore) BZ 576

Implemented support for UserTerm (Method invocation) for the Unload operator as per the ACPI spec. (Lin Ming) BZ 580

Implemented header file support for new ACPI tables - BERT, ERST, EINJ, HEST, IBFT, UEFI, WDAT. Disassembler support is forthcoming.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.3K Code, 17.2K Data, 96.5K Total

Debug Version: 158.6K Code, 63.8K Data, 222.4K Total

Current Release:

Non-Debug Version: 79.5K Code, 17.2K Data, 96.7K Total

Debug Version: 159.0K Code, 63.8K Data, 222.8K Total

2) iASL Compiler/Disassembler and Tools:

Implemented support in the disassembler for checksum validation on incoming binary DSDTs and SSDTs. If incorrect, a message is displayed within the table header dump at the start of the disassembly.

Implemented additional debugging information in the namespace listing file created during compilation. In addition to the namespace hierarchy, the full pathname to each namespace object is displayed.

Fixed a problem with the disassembler where invalid ACPI tables could cause faults or infinite loops.

Fixed an unexpected parse error when using the optional "parameter types" list in a control method declaration. (Lin Ming) BZ 397

Fixed a problem where two External declarations with the same name did not cause an error (Lin Ming) BZ 509

Implemented support for full TermArgs (adding Argx, Localx and method invocation) for the ParameterData parameter to the LoadTable operator. (Lin Ming) BZ 583,587

19 December 2007. Summary of changes for version 20071219:

1) ACPI CA Core Subsystem:

Implemented full support for deferred execution for the TermArg string arguments for DataTableRegion. This enables forward references and full operand resolution for the three string arguments. Similar to OperationRegion deferred argument execution.) Lin Ming. BZ 430

Implemented full argument resolution support for the BankValue argument to BankField. Previously, only constants were supported, now any TermArg may be used. Lin Ming BZ 387, 393

Fixed a problem with AcpiGetDevices where the search of a branch of the device tree could be terminated prematurely. In accordance with the ACPI specification, the search down the current branch is terminated if a device is both not present and not functional (instead of just not present.) Yakui Zhao.

Fixed a problem where "unknown" GPEs could be allowed to fire repeatedly if the underlying AML code changed the GPE enable registers. Now, any unknown incoming GPE (no _Lxx/_Exx method and not the EC GPE) is immediately disabled instead of simply ignored. Rui Zhang.

Fixed a problem with Index Fields where the Index register was incorrectly

limited to a maximum of 32 bits. Now any size may be used.

Fixed a couple memory leaks associated with "implicit return" objects when the AML Interpreter slack mode is enabled. Lin Ming BZ 349

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.0K Code, 17.2K Data, 96.2K Total

Debug Version: 157.9K Code, 63.6K Data, 221.5K Total

Current Release:

Non-Debug Version: 79.3K Code, 17.2K Data, 96.5K Total

Debug Version: 158.6K Code, 63.8K Data, 222.4K Total

14 November 2007. Summary of changes for version 20071114:

1) ACPI CA Core Subsystem:

Implemented event counters for each of the Fixed Events, the ACPI SCI (interrupt) itself, and control methods executed. Named `AcpiFixedEventCount[]`, `AcpiSciCount`, and `AcpiMethodCount` respectively. These should be useful for debugging and statistics.

Implemented a new external interface, `AcpiGetStatistics`, to retrieve the contents of the various event counters. Returns the current values for `AcpiSciCount`, `AcpiGpeCount`, the `AcpiFixedEventCount` array, and `AcpiMethodCount`. The interface can be expanded in the future if new counters are added. Device drivers should use this interface rather than access the counters directly.

Fixed a problem with the `FromBCD` and `ToBCD` operators. With some compilers, the `ShortDivide` function worked incorrectly, causing problems with the `BCD` functions with large input values. A truncation from 64-bit to 32-bit inadvertently occurred. Internal BZ 435. Lin Ming

Fixed a problem with `Index` references passed as method arguments. References passed as arguments to control methods were dereferenced immediately (before control was passed to the called method). The references are now correctly passed directly to the called method. BZ 5389. Lin Ming

Fixed a problem with `CopyObject` used in conjunction with the `Index` operator. The reference was incorrectly dereferenced before the copy. The reference is now correctly copied. BZ 5391. Lin Ming

Fixed a problem with Control Method references within Package objects. These references are now correctly generated. This completes the package construction overhaul that began in version 20071019.

Example Code and Data Size: These are the sizes for the OS-independent `apica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.8K Code, 17.2K Data, 96.0K Total

Debug Version: 157.2K Code, 63.4K Data, 220.6K Total

Current Release:

Non-Debug Version: 79.0K Code, 17.2K Data, 96.2K Total

Debug Version: 157.9K Code, 63.6K Data, 221.5K Total

2) iASL Compiler/Disassembler and Tools:

The `AcpiExec` utility now installs handlers for all of the predefined Operation Region types. New types supported are: `PCI_Config`, `CMOS`, and `PCIBARTarget`.

Fixed a problem with the 64-bit version of `AcpiExec` where the extended (64-bit) address fields for the `DSDT` and `FACS` within the `FADT` were not being used, causing truncation of the upper 32-bits of these addresses. Lin Ming and Bob Moore

19 October 2007. Summary of changes for version 20071019:

1) ACPI CA Core Subsystem:

Fixed a problem with the `Alias` operator when the target of the alias is a named ASL operator that opens a new scope -- `Scope`, `Device`, `PowerResource`, `Processor`, and `ThermalZone`. In these cases, any children of the original operator could not be accessed via the alias, potentially causing unexpected `AE_NOT_FOUND` exceptions. (BZ 9067)

Fixed a problem with the `Package` operator where all named references were created as object references and left otherwise unresolved. According to the ACPI specification, a `Package` can only contain `Data Objects` or references to control methods. The implication is that named references to `Data Objects` (`Integer`, `Buffer`, `String`, `Package`, `BufferField`, `Field`) should be resolved immediately upon package creation. This is the approach taken with this change. References to all other named objects (`Methods`, `Devices`, `Scopes`, etc.) are all now properly created as reference objects. (BZ 5328)

Reverted a change to Notify handling that was introduced in version 20070508. This version changed the Notify handling from asynchronous to fully synchronous (Device driver Notify handling with respect to the Notify ASL operator). It was found that this change caused more problems than it solved and was removed by most users.

Fixed a problem with the Increment and Decrement operators where the type of the target object could be unexpectedly and incorrectly changed. (BZ 353)
Lin Ming.

Fixed a problem with the Load and LoadTable operators where the table location within the namespace was ignored. Instead, the table was always loaded into the root or current scope. Lin Ming.

Fixed a problem with the Load operator when loading a table from a buffer object. The input buffer was prematurely zeroed and/or deleted. (BZ 577)

Fixed a problem with the Debug object where a store of a DdbHandle reference object to the Debug object could cause a fault.

Added a table checksum verification for the Load operator, in the case where the load is from a buffer. (BZ 578).

Implemented additional parameter validation for the LoadTable operator. The length of the input strings SignatureString, OemIdString, and OemTableId are now checked for maximum lengths. (BZ 582) Lin Ming.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.5K Code, 17.1K Data, 95.6K Total

Debug Version: 156.7K Code, 63.2K Data, 219.9K Total

Current Release:

Non-Debug Version: 78.8K Code, 17.2K Data, 96.0K Total

Debug Version: 157.2K Code, 63.4K Data, 220.6K Total

2) iASL Compiler/Disassembler:

Fixed a problem where if a single file was specified and the file did not exist, no error message was emitted. (Introduced with wildcard support in version 20070917.)

19 September 2007. Summary of changes for version 20070919:

1) ACPI CA Core Subsystem:

Designed and implemented new external interfaces to install and remove handlers for ACPI table-related events. Current events that are defined are LOAD and UNLOAD. These interfaces allow the host to track ACPI tables as they are dynamically loaded and unloaded. See AcpiInstallTableHandler and AcpiRemoveTableHandler. (Lin Ming and Bob Moore)

Fixed a problem where the use of the AcpiGbl_AllMethodsSerialized flag (acpi_serialized option on Linux) could cause some systems to hang during initialization. (Bob Moore) BZ 8171

Fixed a problem where objects of certain types (Device, ThermalZone, Processor, PowerResource) can be not found if they are declared and referenced from within the same control method (Lin Ming) BZ 341

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.3K Code, 17.0K Data, 95.3K Total

Debug Version: 156.3K Code, 63.1K Data, 219.4K Total

Current Release:

Non-Debug Version: 78.5K Code, 17.1K Data, 95.6K Total

Debug Version: 156.7K Code, 63.2K Data, 219.9K Total

2) iASL Compiler/Disassembler:

Implemented support to allow multiple files to be compiled/disassembled in a single invocation. This includes command line wildcard support for both the Windows and Unix versions of the compiler. This feature simplifies the disassembly and compilation of multiple ACPI tables in a single directory.

08 May 2007. Summary of changes for version 20070508:

1) ACPI CA Core Subsystem:

Implemented a Microsoft compatibility design change for the handling of the Notify AML operator. Previously, notify handlers were dispatched and executed completely asynchronously in a deferred thread. The new design still executes the notify handlers in a different thread, but the original thread that executed the Notify() now waits at a synchronization point for the notify handler to complete. Some machines depend on a synchronous Notify

operator in order to operate correctly.

Implemented support to allow Package objects to be passed as method arguments to the external AcpiEvaluateObject interface. Previously, this would return the AE_NOT_IMPLEMENTED exception. This feature had not been implemented since there were no reserved control methods that required it until recently.

Fixed a problem with the internal FADT conversion where ACPI 1.0 FADTs that contained invalid non-zero values in reserved fields could cause later failures because these fields have meaning in later revisions of the FADT. For incoming ACPI 1.0 FADTs, these fields are now always zeroed. (The fields are: Preferred_PM_Profile, PSTATE_CNT, CST_CNT, and IAPC_BOOT_FLAGS.)

Fixed a problem where the Global Lock handle was not properly updated if a thread that acquired the Global Lock via executing AML code then attempted to acquire the lock via the AcpiAcquireGlobalLock interface. Reported by Joe Liu.

Fixed a problem in AcpiEvDeleteGpeXrupt where the global interrupt list could be corrupted if the interrupt being removed was at the head of the list. Reported by Linn Crosetto.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.0K Code, 17.1K Data, 95.1K Total

Debug Version: 155.9K Code, 63.1K Data, 219.0K Total

Current Release:

Non-Debug Version: 78.3K Code, 17.0K Data, 95.3K Total

Debug Version: 156.3K Code, 63.1K Data, 219.4K Total

20 March 2007. Summary of changes for version 20070320:

1) ACPI CA Core Subsystem:

Implemented a change to the order of interpretation and evaluation of AML operand objects within the AML interpreter. The interpreter now evaluates operands in the order that they appear in the AML stream (and the corresponding ASL code), instead of in the reverse order (after the entire operand list has been parsed). The previous behavior caused several subtle incompatibilities with the Microsoft AML interpreter as well as being somewhat non-intuitive. BZ 7871, local BZ 263. Valery Podrezov.

Implemented a change to the ACPI Global Lock support. All interfaces to the global lock now allow the same thread to acquire the lock multiple times. This affects the AcpiAcquireGlobalLock external interface to the global lock as well as the internal use of the global lock to support AML fields -- a control method that is holding the global lock can now simultaneously access AML fields that require global lock protection. Previously, in both cases, this would have resulted in an AE_ALREADY_ACQUIRED exception. The change to AcpiAcquireGlobalLock is of special interest to drivers for the Embedded Controller. There is no change to the behavior of the AML Acquire operator, as this can already be used to acquire a mutex multiple times by the same thread. BZ 8066. With assistance from Alexey Starikovskiy.

Fixed a problem where invalid objects could be referenced in the AML Interpreter after error conditions. During operand evaluation, ensure that the internal "Return Object" field is cleared on error and only valid pointers are stored there. Caused occasional access to deleted objects that resulted in "large reference count" warning messages. Valery Podrezov.

Fixed a problem where an AE_STACK_OVERFLOW internal exception could occur on deeply nested control method invocations. BZ 7873, local BZ 487. Valery Podrezov.

Fixed an internal problem with the handling of result objects on the interpreter result stack. BZ 7872. Valery Podrezov.

Removed obsolete code that handled the case where AML_NAME_OP is the target of a reference (Reference.Opcode). This code was no longer necessary. BZ 7874. Valery Podrezov.

Removed obsolete ACPI_NO_INTEGER64_SUPPORT from two header files. This was a remnant from the previously discontinued 16-bit support.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.0K Code, 17.1K Data, 95.1K Total

Debug Version: 155.8K Code, 63.3K Data, 219.1K Total

Current Release:

Non-Debug Version: 78.0K Code, 17.1K Data, 95.1K Total

Debug Version: 155.9K Code, 63.1K Data, 219.0K Total

26 January 2007. Summary of changes for version 20070126:

1) ACPI CA Core Subsystem:

Added the 2007 copyright to all module headers and signons. This affects virtually every file in the ACPI CA core subsystem, the iASL compiler, and the utilities.

Implemented a fix for an incorrect parameter passed to AcpiTbDeleteTable during a table load. A bad pointer was passed in the case where the DSDT is overridden, causing a fault in this case.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.0K Code, 17.1K Data, 95.1K Total

Debug Version: 155.8K Code, 63.3K Data, 219.1K Total

Current Release:

Non-Debug Version: 78.0K Code, 17.1K Data, 95.1K Total

Debug Version: 155.8K Code, 63.3K Data, 219.1K Total

15 December 2006. Summary of changes for version 20061215:

1) ACPI CA Core Subsystem:

Support for 16-bit ACPI CA has been completely removed since it is no longer necessary and it clutters the code. All 16-bit macros, types, and conditional compiles have been removed, cleaning up and simplifying the code across the entire subsystem. DOS support is no longer needed since the bootable Linux firmware kit is now available.

The handler for the Global Lock is now removed during AcpiTerminate to enable a clean subsystem restart, via the implementation of the AcpiEvRemoveGlobalLockHandler function. (With assistance from Joel Bretz, HP)

Implemented enhancements to the multithreading support within the debugger to enable improved multithreading debugging and evaluation of the subsystem. (Valery Podrezov)

Debugger: Enhanced the Statistics/Memory command to emit the total (maximum) memory used during the execution, as well as the maximum memory consumed by each of the various object types. (Valery Podrezov)

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has

a much larger code and data size.

Previous Release:

Non-Debug Version: 77.9K Code, 17.0K Data, 94.9K Total

Debug Version: 155.2K Code, 63.1K Data, 218.3K Total

Current Release:

Non-Debug Version: 78.0K Code, 17.1K Data, 95.1K Total

Debug Version: 155.8K Code, 63.3K Data, 219.1K Total

2) iASL Compiler/Disassembler and Tools:

AcpiExec: Implemented a new option (-m) to display full memory use statistics upon subsystem/program termination. (Valery Podrezov)

09 November 2006. Summary of changes for version 20061109:

1) ACPI CA Core Subsystem:

Optimized the Load ASL operator in the case where the source operand is an operation region. Simply map the operation region memory, instead of performing a bitwise read. (Region must be of type SystemMemory, see below.)

Fixed the Load ASL operator for the case where the source operand is a region field. A buffer object is also allowed as the source operand. BZ 480

Fixed a problem where the Load ASL operator allowed the source operand to be an operation region of any type. It is now restricted to regions of type SystemMemory, as per the ACPI specification. BZ 481

Additional cleanup and optimizations for the new Table Manager code.

AcpiEnable will now fail if all of the required ACPI tables are not loaded (FADT, FACS, DSDT). BZ 477

Added #pragma pack(8/4) to aobject.h to ensure that the structures in this header are always compiled as aligned. The ACPI_OPERAND_OBJECT has been manually optimized to be aligned and will not work if it is byte-packed.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 78.1K Code, 17.1K Data, 95.2K Total

Debug Version: 155.4K Code, 63.1K Data, 218.5K Total
Current Release:
Non-Debug Version: 77.9K Code, 17.0K Data, 94.9K Total
Debug Version: 155.2K Code, 63.1K Data, 218.3K Total

2) iASL Compiler/Disassembler and Tools:

Fixed a problem where the presence of the `_OSI` predefined control method within complex expressions could cause an internal compiler error.

AcpiExec: Implemented full region support for multiple address spaces.
SpaceId is now part of the REGION object. BZ 429

11 October 2006. Summary of changes for version 20061011:

1) ACPI CA Core Subsystem:

Completed an AML interpreter performance enhancement for control method execution. Previously a 2-pass parse/execution, control methods are now completely parsed and executed in a single pass. This improves overall interpreter performance by ~25%, reduces code size, and reduces CPU stack use. (Valery Podrezov + interpreter changes in version 20051202 that eliminated namespace loading during the pass one parse.)

Implemented `_CID` support for PCI Root Bridge detection. If the `_HID` does not match the predefined PCI Root Bridge IDs, the `_CID` list (if present) is now obtained and also checked for an ID match.

Implemented additional support for the PCI `_ADR` execution: upsearch until a device scope is found before executing `_ADR`. This allows PCI_Config operation regions to be declared locally within control methods underneath PCI device objects.

Fixed a problem with a possible race condition between threads executing `AcpiWalkNamespace` and the AML interpreter. This condition was removed by modifying `AcpiWalkNamespace` to (by default) ignore all temporary namespace entries created during any concurrent control method execution. An additional namespace race condition is known to exist between `AcpiWalkNamespace` and the Load/Unload ASL operators and is still under investigation.

Restructured the AML ParseLoop function, breaking it into several subfunctions in order to reduce CPU stack use and improve maintainability. (Mikhail Kouzmich)

AcpiGetHandle: Fix for parameter validation to detect invalid combinations

of prefix handle and pathname. BZ 478

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 77.9K Code, 17.1K Data, 95.0K Total

Debug Version: 154.6K Code, 63.0K Data, 217.6K Total

Current Release:

Non-Debug Version: 78.1K Code, 17.1K Data, 95.2K Total

Debug Version: 155.4K Code, 63.1K Data, 218.5K Total

2) iASL Compiler/Disassembler and Tools:

Ported the `-g` option (get local ACPI tables) to the new ACPICA Table Manager to restore original behavior.

27 September 2006. Summary of changes for version 20060927:

1) ACPI CA Core Subsystem:

Removed the "Flags" parameter from `AcpiGetRegister` and `AcpiSetRegister`. These functions now use a spinlock for mutual exclusion and the interrupt level indication flag is not needed.

Fixed a problem with the Global Lock where the lock could appear to be obtained before it is actually obtained. The global lock semaphore was inadvertently created with one unit instead of zero units. (BZ 464) Fiodor Suietov.

Fixed a possible memory leak and fault in `AcpiExResolveObjectToValue` during a read from a buffer or region field. (BZ 458) Fiodor Suietov.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 77.9K Code, 17.1K Data, 95.0K Total

Debug Version: 154.7K Code, 63.0K Data, 217.7K Total

Current Release:

Non-Debug Version: 77.9K Code, 17.1K Data, 95.0K Total

Debug Version: 154.6K Code, 63.0K Data, 217.6K Total

2) iASL Compiler/Disassembler and Tools:

Fixed a compilation problem with the pre-defined Resource Descriptor field names where an "object does not exist" error could be incorrectly generated if the parent ResourceTemplate pathname places the template within a different namespace scope than the current scope. (BZ 7212)

Fixed a problem where the compiler could hang after syntax errors detected in an ElseIf construct. (BZ 453)

Fixed a problem with the AmlFilename parameter to the DefinitionBlock() operator. An incorrect output filename was produced when this parameter was a null string (""). Now, the original input filename is used as the AML output filename, with an ".aml" extension.

Implemented a generic batch command mode for the AcpiExec utility (execute any AML debugger command) (Valery Podrezov).

12 September 2006. Summary of changes for version 20060912:

1) ACPI CA Core Subsystem:

Enhanced the implementation of the "serialized mode" of the interpreter (enabled via the AcpiGbl_AllMethodsSerialized flag.) When this mode is specified, instead of creating a serialization semaphore per control method, the interpreter lock is simply no longer released before a blocking operation during control method execution. This effectively makes the AML Interpreter single-threaded. The overhead of a semaphore per-method is eliminated.

Fixed a regression where an error was no longer emitted if a control method attempts to create 2 objects of the same name. This once again returns AE_ALREADY_EXISTS. When this exception occurs, it invokes the mechanism that will dynamically serialize the control method to possibly prevent future errors. (BZ 440)

Integrated a fix for a problem with PCI Express HID detection in the PCI Config Space setup procedure. (BZ 7145)

Moved all FADT-related functions to a new file, tbfadt.c. Eliminated the AcpiHwInitialize function - the FADT registers are now validated when the table is loaded.

Added two new warnings during FADT verification - 1) if the FADT is larger than the largest known FADT version, and 2) if there is a mismatch between a 32-bit block address and the 64-bit X counterpart (when both are non-zero.)

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 77.9K Code, 16.7K Data, 94.6K Total

Debug Version: 154.9K Code, 62.6K Data, 217.5K Total

Current Release:

Non-Debug Version: 77.9K Code, 17.1K Data, 95.0K Total

Debug Version: 154.7K Code, 63.0K Data, 217.7K Total

2) iASL Compiler/Disassembler and Tools:

Fixed a problem with the implementation of the Switch() operator where the temporary variable was declared too close to the actual Switch, instead of at method level. This could cause a problem if the Switch() operator is within a while loop, causing an error on the second iteration. (BZ 460)

Disassembler - fix for error emitted for unknown type for target of scope operator. Now, ignore it and continue.

Disassembly of an FADT now verifies the input FADT and reports any errors found. Fix for proper disassembly of full-sized (ACPI 2.0) FADTs.

Disassembly of raw data buffers with byte initialization data now prefixes each output line with the current buffer offset.

Disassembly of ASF! table now includes all variable-length data fields at the end of some of the subtables.

The disassembler now emits a comment if a buffer appears to be a ResourceTemplate, but cannot be disassembled as such because the EndTag does not appear at the very end of the buffer.

AcpiExec - Added the "-t" command line option to enable the serialized mode of the AML interpreter.

31 August 2006. Summary of changes for version 20060831:

1) ACPI CA Core Subsystem:

Miscellaneous fixes for the Table Manager:

- Correctly initialize internal common FADT for all 64-bit "X" fields

- Fixed a couple table mapping issues during table load

- Fixed a couple alignment issues for IA64
- Initialize input array to zero in AcpiInitializeTables
- Additional parameter validation for AcpiGetTable, AcpiGetTableHeader, AcpiGetTableByIndex

Change for GPE support: when a "wake" GPE is received, all wake GPEs are now immediately disabled to prevent the waking GPE from firing again and to prevent other wake GPEs from interrupting the wake process.

Added the AcpiGpeCount global that tracks the number of processed GPEs, to be used for debugging systems with a large number of ACPI interrupts.

Implemented support for the "DMAR" ACPI table (DMA Redirection Table) in both the ACPICA headers and the disassembler.

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 77.8K Code, 16.5K Data, 94.3K Total

Debug Version: 154.6K Code, 62.3K Data, 216.9K Total

Current Release:

Non-Debug Version: 77.9K Code, 16.7K Data, 94.6K Total

Debug Version: 154.9K Code, 62.6K Data, 217.5K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler support for the DMAR ACPI table.

23 August 2006. Summary of changes for version 20060823:

1) ACPI CA Core Subsystem:

The Table Manager component has been completely redesigned and reimplemented. The new design is much simpler, and reduces the overall code and data size of the kernel-resident ACPICA by approximately 5%. Also, it is now possible to obtain the ACPI tables very early during kernel initialization, even before dynamic memory management is initialized.

(Alexey Starikovskiy, Fiodor Suietov, Bob Moore)

Obsolete ACPICA interfaces:

- AcpiGetFirmwareTable: Use AcpiGetTable instead (works at early kernel init time).

- AcpiLoadTable: Not needed.
- AcpiUnloadTable: Not needed.

New ACPICA interfaces:

- AcpiInitializeTables: Must be called before the table manager can be used.
- AcpiReallocateRootTable: Used to transfer the root table to dynamically allocated memory after it becomes available.
- AcpiGetTableByIndex: Allows the host to easily enumerate all ACPI tables in the RSDT/XSDT.

Other ACPICA changes:

- AcpiGetTableHeader returns the actual mapped table header, not a copy. Use AcpiOsUnmapMemory to free this mapping.
- AcpiGetTable returns the actual mapped table. The mapping is managed internally and must not be deleted by the caller. Use of this interface causes no additional dynamic memory allocation.
- AcpiFindRootPointer: Support for physical addressing has been eliminated, it appeared to be unused.
- The interface to AcpiOsMapMemory has changed to be consistent with the other allocation interfaces.
- The interface to AcpiOsGetRootPointer has changed to eliminate unnecessary parameters.
- ACPI_PHYSICAL_ADDRESS is now 32 bits on 32-bit platforms, 64 bits on 64-bit platforms. Was previously 64 bits on all platforms.
- The interface to the ACPI Global Lock acquire/release macros have changed slightly since ACPICA no longer keeps a local copy of the FACS with a constructed pointer to the actual global lock.

Porting to the new table manager:

- AcpiInitializeTables: Must be called once, and can be called anytime during the OS initialization process. It allows the host to specify an area of memory to be used to store the internal version of the RSDT/XSDT (root table). This allows the host to access ACPI tables before memory management is initialized and running.
- AcpiReallocateRootTable: Can be called after memory management is running to copy the root table to a dynamically allocated array, freeing up the scratch memory specified in the call to AcpiInitializeTables.
- AcpiSubsystemInitialize: This existing interface is independent of the Table Manager, and does not have to be called before the Table Manager can be used, it only must be called before the rest of ACPICA can be used.
- ACPI Tables: Some changes have been made to the names and structure of the actbl.h and actbl1.h header files and may require changes to existing code. For example, bitfields have been completely removed because of their lack of portability across C compilers.
- Update interfaces to the Global Lock acquire/release macros if local

versions are used. (see acwin.h)

Obsolete files: tbconvrt.c, tbget.c, tbgetall.c, tbrsdt.c

New files: tbfind.c

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.7K Code, 17.9K Data, 98.6K Total

Debug Version: 161.0K Code, 65.1K Data, 226.1K Total

Current Release:

Non-Debug Version: 77.8K Code, 16.5K Data, 94.3K Total

Debug Version: 154.6K Code, 62.3K Data, 216.9K Total

2) iASL Compiler/Disassembler and Tools:

No changes for this release.

21 July 2006. Summary of changes for version 20060721:

1) ACPI CA Core Subsystem:

The full source code for the ASL test suite used to validate the iASL compiler and the ACPI CA core subsystem is being released with the ACPI CA source for the first time. The source is contained in a separate package and consists of over 1100 files that exercise all ASL/AML operators. The package should appear on the Intel/ACPI web site shortly. (Valery Podrezov, Fiodor Suietov)

Completed a new design and implementation for support of the ACPI Global Lock. On the OS side, the global lock is now treated as a standard AML mutex. Previously, multiple OS threads could "acquire" the global lock simultaneously. However, this could cause the BIOS to be starved out of the lock - especially in cases such as the Embedded Controller driver where there is a tight coupling between the OS and the BIOS.

Implemented an optimization for the ACPI Global Lock interrupt mechanism. The Global Lock interrupt handler no longer queues the execution of a separate thread to signal the global lock semaphore. Instead, the semaphore is signaled directly from the interrupt handler.

Implemented support within the AML interpreter for package objects that

contain a larger AML length (package list length) than the package element count. In this case, the length of the package is truncated to match the package element count. Some BIOS code apparently modifies the package length on the fly, and this change supports this behavior. Provides compatibility with the MS AML interpreter. (With assistance from Fiodor Suietov)

Implemented a temporary fix for the BankValue parameter of a Bank Field to support all constant values, now including the Zero and One opcodes. Evaluation of this parameter must eventually be converted to a full TermArg evaluation. A not-implemented error is now returned (temporarily) for non-constant values for this parameter.

Fixed problem reports (Fiodor Suietov) integrated:

- Fix for premature object deletion after CopyObject on Operation Region (BZ 350)

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.7K Code, 18.0K Data, 98.7K Total

Debug Version: 160.9K Code, 65.1K Data, 226.0K Total

Current Release:

Non-Debug Version: 80.7K Code, 17.9K Data, 98.6K Total

Debug Version: 161.0K Code, 65.1K Data, 226.1K Total

2) iASL Compiler/Disassembler and Tools:

No changes for this release.

07 July 2006. Summary of changes for version 20060707:

1) ACPI CA Core Subsystem:

Added the `ACPI_PACKED_POINTERS_NOT_SUPPORTED` macro to support C compilers that do not allow the initialization of address pointers within packed structures - even though the hardware itself may support misaligned transfers. Some of the debug data structures are packed by default to minimize size.

Added an error message for the case where `AcpiOsGetThreadId()` returns zero. A non-zero value is required by the core ACPI CA code to ensure the proper operation of AML mutexes and recursive control methods.

The DSDT is now the only ACPI table that determines whether the AML interpreter is in 32-bit or 64-bit mode. Not really a functional change, but the hooks for per-table 32/64 switching have been removed from the code. A clarification to the ACPI specification is forthcoming in ACPI 3.0B.

Fixed a possible leak of an OwnerID in the error path of AcpiTbInitTableDescriptor (tbinstal.c), and migrated all table OwnerID deletion to a single place in AcpiTbUninstallTable to correct possible leaks when using the AcpiTbDeleteTablesByType interface (with assistance from Lance Ortiz.)

Fixed a problem with Serialized control methods where the semaphore associated with the method could be over-signaled after multiple method invocations.

Fixed two issues with the locking of the internal namespace data structure. Both the Unload() operator and AcpiUnloadTable interface now lock the namespace during the namespace deletion associated with the table unload (with assistance from Linn Crosetto.)

Fixed problem reports (Valery Podrezov) integrated:

- Eliminate unnecessary memory allocation for CreateXxxxField (BZ 5426)

Fixed problem reports (Fiodor Suietov) integrated:

- Incomplete cleanup branches in AcpiTbGetTableRsdt (BZ 369)
- On Address Space handler deletion, needless deactivation call (BZ 374)
- AcpiRemoveAddressSpaceHandler: validate Device handle parameter (BZ 375)
- Possible memory leak, Notify sub-objects of Processor, Power, ThermalZone (BZ 376)
- AcpiRemoveAddressSpaceHandler: validate Handler parameter (BZ 378)
- Minimum Length of RSDT should be validated (BZ 379)
- AcpiRemoveNotifyHandler: return AE_NOT_EXIST if Processor Obj has no Handler (BZ (380)
- AcpiUnloadTable: return AE_NOT_EXIST if no table of specified type loaded (BZ 381)

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.5K Code, 17.8K Data, 98.3K Total

Debug Version: 160.8K Code, 64.8K Data, 225.6K Total

Current Release:

Non-Debug Version: 80.7K Code, 17.9K Data, 98.6K Total

Debug Version: 161.0K Code, 65.1K Data, 226.1K Total

2) iASL Compiler/Disassembler and Tools:

Fixed problem reports:

Compiler segfault when ASL contains a long (>1024) String declaration (BZ 436)

23 June 2006. Summary of changes for version 20060623:

1) ACPI CA Core Subsystem:

Implemented a new ACPI_SPINLOCK type for the OSL lock interfaces. This allows the type to be customized to the host OS for improved efficiency (since a spinlock is usually a very small object.)

Implemented support for "ignored" bits in the ACPI registers. According to the ACPI specification, these bits should be preserved when writing the registers via a read/modify/write cycle. There are 3 bits preserved in this manner: PM1_CONTROL[0] (SCI_EN), PM1_CONTROL[9], and PM1_STATUS[11].

Implemented the initial deployment of new OSL mutex interfaces. Since some host operating systems have separate mutex and semaphore objects, this feature was requested. The base code now uses mutexes (and the new mutex interfaces) wherever a binary semaphore was used previously. However, for the current release, the mutex interfaces are defined as macros to map them to the existing semaphore interfaces. Therefore, no OSL changes are required at this time. (See acpiosxf.h)

Fixed several problems with the support for the control method SyncLevel parameter. The SyncLevel now works according to the ACPI specification and in concert with the Mutex SyncLevel parameter, since the current SyncLevel is a property of the executing thread. Mutual exclusion for control methods is now implemented with a mutex instead of a semaphore.

Fixed three instances of the use of the C shift operator in the bitfield support code (exfldio.c) to avoid the use of a shift value larger than the target data width. The behavior of C compilers is undefined in this case and can cause unpredictable results, and therefore the case must be detected and avoided. (Fiodor Suietov)

Added an info message whenever an SSDT or OEM table is loaded dynamically via the Load() or LoadTable() ASL operators. This should improve debugging capability since it will show exactly what tables have been loaded (beyond the tables present in the RSDT/XSDT.)

Example Code and Data Size: These are the sizes for the OS-independent acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The

debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.0K Code, 17.6K Data, 97.6K Total

Debug Version: 160.2K Code, 64.7K Data, 224.9K Total

Current Release:

Non-Debug Version: 80.5K Code, 17.8K Data, 98.3K Total

Debug Version: 160.8K Code, 64.8K Data, 225.6K Total

2) iASL Compiler/Disassembler and Tools:

No changes for this release.

08 June 2006. Summary of changes for version 20060608:

1) ACPI CA Core Subsystem:

Converted the locking mutex used for the ACPI hardware to a spinlock. This change should eliminate all problems caused by attempting to acquire a semaphore at interrupt level, and it means that all ACPICA external interfaces that directly access the ACPI hardware can be safely called from interrupt level. OSL code that implements the semaphore interfaces should be able to eliminate any workarounds for being called at interrupt level.

Fixed a regression introduced in 20060526 where the ACPI device initialization could be prematurely aborted with an AE_NOT_FOUND if a device did not have an optional _INI method.

Fixed an IndexField issue where a write to the Data Register should be limited in size to the AccessSize (width) of the IndexField itself. (BZ 433, Fiodor Suietov)

Fixed problem reports (Valery Podrezov) integrated:

- Allow store of ThermalZone objects to Debug object (BZ 5369/5370)

Fixed problem reports (Fiodor Suietov) integrated:

- AcpiGetTableHeader doesn't handle multiple instances correctly (BZ 364)

Removed four global mutexes that were obsolete and were no longer being used.

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.0K Code, 17.7K Data, 97.7K Total

Debug Version: 160.3K Code, 64.9K Data, 225.2K Total

Current Release:

Non-Debug Version: 80.0K Code, 17.6K Data, 97.6K Total

Debug Version: 160.2K Code, 64.7K Data, 224.9K Total

2) iASL Compiler/Disassembler and Tools:

Fixed a fault when using -g option (get tables from registry) on Windows machines.

Fixed problem reports integrated:

- Generate error if CreateField NumBits parameter is zero. (BZ 405)
- Fault if Offset/Length in Field unit is very large (BZ 432, Fiodor Suietov)
- Global table revision override (-r) is ignored (BZ 413)

26 May 2006. Summary of changes for version 20060526:

1) ACPI CA Core Subsystem:

Restructured, flattened, and simplified the internal interfaces for namespace object evaluation - resulting in smaller code, less CPU stack use, and fewer interfaces. (With assistance from Mikhail Kouzmich)

Fixed a problem with the CopyObject operator where the first parameter was not typed correctly for the parser, interpreter, compiler, and disassembler. Caused various errors and unexpected behavior.

Fixed a problem where a ShiftLeft or ShiftRight of more than 64 bits produced incorrect results with some C compilers. Since the behavior of C compilers when the shift value is larger than the datatype width is apparently not well defined, the interpreter now detects this condition and simply returns zero as expected in all such cases. (BZ 395)

Fixed problem reports (Valery Podrezov) integrated:

- Update String-to-Integer conversion to match ACPI 3.0A spec (BZ 5329)
- Allow interpreter to handle nested method declarations (BZ 5361)

Fixed problem reports (Fiodor Suietov) integrated:

- AcpiTerminate doesn't free debug memory allocation list objects (BZ 355)
- After Core Subsystem shutdown, AcpiSubsystemStatus returns AE_OK (BZ 356)
- AcpiOsUnmapMemory for RSDP can be invoked inconsistently (BZ 357)
- Resource Manager should return AE_TYPE for non-device objects (BZ 358)

- Incomplete cleanup branch in AcpiNsEvaluateRelative (BZ 359)
- Use AcpiOsFree instead of ACPI_FREE in AcpiRsSetSrsMethodData (BZ 360)
- Incomplete cleanup branch in AcpiPsParseAml (BZ 361)
- Incomplete cleanup branch in AcpiDsDeleteWalkState (BZ 362)
- AcpiGetTableHeader returns AE_NO_ACPI_TABLES until DSDT is loaded (BZ 365)
- Status of the Global Initialization Handler call not used (BZ 366)
- Incorrect object parameter to Global Initialization Handler (BZ 367)

Example Code and Data Size: These are the sizes for the OS-independent `apica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.8K Code, 17.7K Data, 97.5K Total

Debug Version: 160.5K Code, 65.1K Data, 225.6K Total

Current Release:

Non-Debug Version: 80.0K Code, 17.7K Data, 97.7K Total

Debug Version: 160.3K Code, 64.9K Data, 225.2K Total

2) iASL Compiler/Disassembler and Tools:

Modified the parser to allow the names IO, DMA, and IRQ to be used as namespace identifiers with no collision with existing resource descriptor macro names. This provides compatibility with other ASL compilers and is most useful for disassembly/recompilation of existing tables without parse errors. (With assistance from Thomas Renninger)

Disassembler: fixed an incorrect disassembly problem with the `DataTableRegion` and `CopyObject` operators. Fixed a possible fault during disassembly of some `Alias` operators.

12 May 2006. Summary of changes for version 20060512:

1) ACPI CA Core Subsystem:

Replaced the `AcpiOsQueueForExecution` interface with a new interface named `AcpiOsExecute`. The major difference is that the new interface does not have a `Priority` parameter, this appeared to be useless and has been replaced by a `Type` parameter. The `Type` tells the host what type of execution is being requested, such as global lock handler, notify handler, GPE handler, etc. This allows the host to queue and execute the request as appropriate for the request type, possibly using different work queues and different priorities for the various request types. This enables fixes for multithreading deadlock problems such as BZ #5534, and will require changes to all existing OS interface layers. (Alexey Starikovskiy and Bob Moore)

Fixed a possible memory leak associated with the support for the so-called "implicit return" ACPI extension. Reported by FreeBSD, BZ #6514. (Fiodor Suietov)

Fixed a problem with the Load() operator where a table load from an operation region could overwrite an internal table buffer by up to 7 bytes and cause alignment faults on IPF systems. (With assistance from Luming Yu)

Example Code and Data Size: These are the sizes for the OS-independent apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 79.7K Code, 17.7K Data, 97.4K Total

Debug Version: 160.1K Code, 65.2K Data, 225.3K Total

Current Release:

Non-Debug Version: 79.8K Code, 17.7K Data, 97.5K Total

Debug Version: 160.5K Code, 65.1K Data, 225.6K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: Implemented support to cross reference the internal namespace and automatically generate ASL External() statements for symbols not defined within the current table being disassembled. This will simplify the disassembly and recompilation of interdependent tables such as SSDTs since these statements will no longer have to be added manually.

Disassembler: Implemented experimental support to automatically detect invocations of external control methods and generate appropriate External() statements. This is problematic because the AML cannot be correctly parsed until the number of arguments for each control method is known. Currently, standalone method invocations and invocations as the source operand of a Store() statement are supported.

Disassembler: Implemented support for the ASL pseudo-operators LNotEqual, LLessEqual, and LGreaterEqual. Previously disassembled as LNot(LEqual()), LNot(LGreater()), and LNot(LLess()), this makes the disassembled ASL code more readable and likely closer to the original ASL source.

21 April 2006. Summary of changes for version 20060421:

1) ACPI CA Core Subsystem:

Removed a device initialization optimization introduced in 20051216 where the `_STA` method was not run unless an `_INI` was also present for the same device. This optimization could cause problems because it could allow `_INI` methods to be run within a not-present device subtree. (If a not-present device had no `_INI`, `_STA` would not be run, the not-present status would not be discovered, and the children of the device would be incorrectly traversed.)

Implemented a new `_STA` optimization where namespace subtrees that do not contain `_INI` are identified and ignored during device initialization. Selectively running `_STA` can significantly improve boot time on large machines (with assistance from Len Brown.)

Implemented support for the device initialization case where the returned `_STA` flags indicate a device not-present but functioning. In this case, `_INI` is not run, but the device children are examined for presence, as per the ACPI specification.

Implemented an additional change to the `IndexField` support in order to conform to MS behavior. The value written to the `Index Register` is not simply a byte offset, it is a byte offset in units of the access width of the parent `Index Field`. (Fiodor Suietov)

Defined and deployed a new OSL interface, `AcpiOsValidateAddress`. This interface is called during the creation of all AML operation regions, and allows the host OS to exert control over what addresses it will allow the AML code to access. Operation Regions whose addresses are disallowed will cause a runtime exception when they are actually accessed (will not affect or abort table loading.) See `oswinxf` or `osunixxf` for an example implementation.

Defined and deployed a new OSL interface, `AcpiOsValidateInterface`. This interface allows the host OS to match the various "optional" interface/behavior strings for the `_OSI` predefined control method as appropriate (with assistance from Bjorn Helgaas.) See `oswinxf` or `osunixxf` for an example implementation.

Restructured and corrected various problems in the exception handling code paths within `DsCallControlMethod` and `DsTerminateControlMethod` in `dsmethod` (with assistance from Takayoshi Kochi.)

Modified the Linux source converter to ignore quoted string literals while converting identifiers from mixed to lower case. This will correct problems with the disassembler and other areas where such strings must not be modified.

The `ACPI_FUNCTION_*` macros no longer require quotes around the function name. This allows the Linux source converter to convert the names, now that

the converter ignores quoted strings.

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 81.1K Code, 17.7K Data, 98.8K Total

Debug Version: 158.9K Code, 64.9K Data, 223.8K Total

Current Release:

Non-Debug Version: 79.7K Code, 17.7K Data, 97.4K Total

Debug Version: 160.1K Code, 65.2K Data, 225.3K Total

2) iASL Compiler/Disassembler and Tools:

Implemented 3 new warnings for iASL, and implemented multiple warning levels (w2 flag).

1) Ignored timeouts: If the `TimeoutValue` parameter to `Wait` or `Acquire` is not `WAIT_FOREVER (0xFFFF)` and the code does not examine the return value to check for the possible timeout, a warning is issued.

2) Useless operators: If an ASL operator does not specify an optional target operand and it also does not use the function return value from the operator, a warning is issued since the operator effectively does nothing.

3) Unreferenced objects: If a namespace object is created, but never referenced, a warning is issued. This is a warning level 2 since there are cases where this is ok, such as when a secondary table is loaded that uses the unreferenced objects. Even so, care is taken to only flag objects that don't look like they will ever be used. For example, the reserved methods (starting with an underscore) are usually not referenced because it is expected that the OS will invoke them.

31 March 2006. Summary of changes for version 20060331:

1) ACPI CA Core Subsystem:

Implemented header file support for the following additional ACPI tables: ASF!, BOOT, CPEP, DDBG, MCFG, SPCR, SPMI, TCPA, and WDRT. With this support, all current and known ACPI tables are now defined in the ACPICA headers and are available for use by device drivers and other software.

Implemented support to allow tables that contain ACPI names with invalid

characters to be loaded. Previously, this would cause the table load to fail, but since there are several known cases of such tables on existing machines, this change was made to enable ACPI support for them. Also, this matches the behavior of the Microsoft ACPI implementation.

Fixed a couple regressions introduced during the memory optimization in the 20060317 release. The namespace node definition required additional reorganization and an internal datatype that had been changed to 8-bit was restored to 32-bit. (Valery Podrezov)

Fixed a problem where a null pointer passed to `AcpiUtDeleteGenericState` could be passed through to `AcpiOsReleaseObject` which is unexpected. Such null pointers are now trapped and ignored, matching the behavior of the previous implementation before the deployment of `AcpiOsReleaseObject`. (Valery Podrezov, Fiodor Suietov)

Fixed a memory mapping leak during the deletion of a `SystemMemory` operation region where a cached memory mapping was not deleted. This became a noticeable problem for operation regions that are defined within frequently used control methods. (Dana Meyers)

Reorganized the ACPI table header files into two main files: one for the ACPI tables consumed by the ACPICA core, and another for the miscellaneous ACPI tables that are consumed by the drivers and other software. The various FADT definitions were merged into one common section and three different tables (ACPI 1.0, 1.0+, and 2.0)

Example Code and Data Size: These are the sizes for the OS-independent `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size.

Previous Release:

Non-Debug Version: 80.9K Code, 17.7K Data, 98.6K Total

Debug Version: 158.7K Code, 64.8K Data, 223.5K Total

Current Release:

Non-Debug Version: 81.1K Code, 17.7K Data, 98.8K Total

Debug Version: 158.9K Code, 64.9K Data, 223.8K Total

2) iASL Compiler/Disassembler and Tools:

Disassembler: Implemented support to decode and format all non-AML ACPI tables (tables other than DSDTs and SSDTs.) This includes the new tables added to the ACPICA headers, therefore all current and known ACPI tables are supported.

Disassembler: The change to allow ACPI names with invalid characters also

enables the disassembly of such tables. Invalid characters within names are changed to '*' to make the name printable; the iASL compiler will still generate an error for such names, however, since this is an invalid ACPI character.

Implemented an option for AcpiXtract (-a) to extract all tables found in the input file. The default invocation extracts only the DSDTs and SSDTs.

Fixed a couple of gcc generation issues for iASL and AcpiExec and added a makefile for the AcpiXtract utility.

17 March 2006. Summary of changes for version 20060317:

1) ACPI CA Core Subsystem:

Implemented the use of a cache object for all internal namespace nodes. Since there are about 1000 static nodes in a typical system, this will decrease memory use for cache implementations that minimize per-allocation overhead (such as a slab allocator.)

Removed the reference count mechanism for internal namespace nodes, since it was deemed unnecessary. This reduces the size of each namespace node by about 5%-10% on all platforms. Nodes are now 20 bytes for the 32-bit case, and 32 bytes for the 64-bit case.

Optimized several internal data structures to reduce object size on 64-bit platforms by packing data within the 64-bit alignment. This includes the frequently used ACPI_OPERAND_OBJECT, of which there can be ~1000 static instances corresponding to the namespace objects.

Added two new strings for the predefined _OSI method: "Windows 2001.1 SP1" and "Windows 2006".

Split the allocation tracking mechanism out to a separate file, from utalloc.c to uttrack.c. This mechanism appears to be only useful for application-level code. Kernels may wish to not include uttrack.c in distributions.

Removed all remnants of the obsolete ACPI_REPORT_* macros and the associated code. (These macros have been replaced by the ACPI_ERROR and ACPI_WARNING macros.)

Code and Data Size: These are the sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the

compiler options used during generation.

Previous Release:

Non-Debug Version: 81.1K Code, 17.8K Data, 98.9K Total

Debug Version: 161.6K Code, 65.7K Data, 227.3K Total

Current Release:

Non-Debug Version: 80.9K Code, 17.7K Data, 98.6K Total

Debug Version: 158.7K Code, 64.8K Data, 223.5K Total

2) iASL Compiler/Disassembler and Tools:

Implemented an ANSI C version of the acpextract utility. This version will automatically extract the DSDT and all SSDTs from the input acpidump text file and dump the binary output to separate files. It can also display a summary of the input file including the headers for each table found and will extract any single ACPI table, with any signature. (See source/tools/acpextract)

10 March 2006. Summary of changes for version 20060310:

1) ACPI CA Core Subsystem:

Tagged all external interfaces to the subsystem with the new ACPI_EXPORT_SYMBOL macro. This macro can be defined as necessary to assist kernel integration. For Linux, the macro resolves to the EXPORT_SYMBOL macro. The default definition is NULL.

Added the ACPI_THREAD_ID type for the return value from AcpiOsGetThreadId. This allows the host to define this as necessary to simplify kernel integration. The default definition is ACPI_NATIVE_UINT.

Fixed two interpreter problems related to error processing, the deletion of objects, and placing invalid pointers onto the internal operator result stack. BZ 6028, 6151 (Valery Podrezov)

Increased the reference count threshold where a warning is emitted for large reference counts in order to eliminate unnecessary warnings on systems with large namespaces (especially 64-bit.) Increased the value from 0x400 to 0x800.

Due to universal disagreement as to the meaning of the 'c' in the calloc() function, the ACPI_MEM_CALLOCATE macro has been renamed to ACPI_ALLOCATE_ZEROED so that the purpose of the interface is 'clear'. ACPI_MEM_ALLOCATE and ACPI_MEM_FREE are renamed to ACPI_ALLOCATE and ACPI_FREE.

Code and Data Size: These are the sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 81.0K Code, 17.8K Data, 98.8K Total

Debug Version: 161.4K Code, 65.7K Data, 227.1K Total

Current Release:

Non-Debug Version: 81.1K Code, 17.8K Data, 98.9K Total

Debug Version: 161.6K Code, 65.7K Data, 227.3K Total

2) iASL Compiler/Disassembler:

Disassembler: implemented support for symbolic resource descriptor references. If a CreateXxxxField operator references a fixed offset within a resource descriptor, a name is assigned to the descriptor and the offset is translated to the appropriate resource tag and pathname. The addition of this support brings the disassembled code very close to the original ASL source code and helps eliminate run-time errors when the disassembled code is modified (and recompiled) in such a way as to invalidate the original fixed offsets.

Implemented support for a Descriptor Name as the last parameter to the ASL Register() macro. This parameter was inadvertently left out of the ACPI specification, and will be added for ACPI 3.0b.

Fixed a problem where the use of the "_OSI" string (versus the full path "_\OSI") caused an internal compiler error. ("No back ptr to op")

Fixed a problem with the error message that occurs when an invalid string is used for a _HID object (such as one with an embedded asterisk: "*PNP010A".) The correct message is now displayed.

17 February 2006. Summary of changes for version 20060217:

1) ACPI CA Core Subsystem:

Implemented a change to the IndexField support to match the behavior of the Microsoft AML interpreter. The value written to the Index register is now a byte offset, no longer an index based upon the width of the Data register. This should fix IndexField problems seen on some machines where the Data register is not exactly one byte wide. The ACPI specification will be clarified on this point.

Fixed a problem where several resource descriptor types could overrun the internal descriptor buffer due to size miscalculation: VendorShort, VendorLong, and Interrupt. This was noticed on IA64 machines, but could affect all platforms.

Fixed a problem where individual resource descriptors were misaligned within the internal buffer, causing alignment faults on IA64 platforms.

Code and Data Size: These are the sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. The values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 81.1K Code, 17.8K Data, 98.9K Total

Debug Version: 161.3K Code, 65.6K Data, 226.9K Total

Current Release:

Non-Debug Version: 81.0K Code, 17.8K Data, 98.8K Total

Debug Version: 161.4K Code, 65.7K Data, 227.1K Total

2) iASL Compiler/Disassembler:

Implemented support for new reserved names: _WDG and _WED are Microsoft extensions for Windows Instrumentation Management, _TDL is a new ACPI-defined method (Throttling Depth Limit.)

Fixed a problem where a zero-length VendorShort or VendorLong resource descriptor was incorrectly emitted as a descriptor of length one.

10 February 2006. Summary of changes for version 20060210:

1) ACPI CA Core Subsystem:

Removed a couple of extraneous ACPI_ERROR messages that appeared during normal execution. These became apparent after the conversion from ACPI_DEBUG_PRINT.

Fixed a problem where the CreateField operator could hang if the BitIndex or NumBits parameter referred to a named object. (Valery Podrezov, BZ 5359)

Fixed a problem where a DeRefOf operation on a buffer object incorrectly failed with an exception. This also fixes a couple of related RefOf and DeRefOf issues. (Valery Podrezov, BZ 5360/5392/5387)

Fixed a problem where the AE_BUFFER_LIMIT exception was returned instead of AE_STRING_LIMIT on an out-of-bounds Index() operation. (Valery Podrezov, BZ 5480)

Implemented a memory cleanup at the end of the execution of each iteration of an AML While() loop, preventing the accumulation of outstanding objects. (Valery Podrezov, BZ 5427)

Eliminated a chunk of duplicate code in the object resolution code. (Valery Podrezov, BZ 5336)

Fixed several warnings during the 64-bit code generation.

The AcpiSrc source code conversion tool now inserts one line of whitespace after an if() statement that is followed immediately by a comment, improving readability of the Linux code.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 81.0K Code, 17.9K Data, 98.9K Total

Debug Version: 161.3K Code, 65.7K Data, 227.0K Total

Current Release:

Non-Debug Version: 81.1K Code, 17.8K Data, 98.9K Total

Debug Version: 161.3K Code, 65.6K Data, 226.9K Total

2) iASL Compiler/Disassembler:

Fixed a problem with the disassembly of a BankField operator with a complex expression for the BankValue parameter.

27 January 2006. Summary of changes for version 20060127:

1) ACPI CA Core Subsystem:

Implemented support in the Resource Manager to allow unresolved namestring references within resource package objects for the _PRT method. This support is in addition to the previously implemented unresolved reference support within the AML parser. If the interpreter slack mode is enabled, these

unresolved references will be passed through to the caller as a NULL package entry.

Implemented and deployed new macros and functions for error and warning messages across the subsystem. These macros are simpler and generate less code than their predecessors. The new macros ACPI_ERROR, ACPI_EXCEPTION, ACPI_WARNING, and ACPI_INFO replace the ACPI_REPORT_* macros. The older macros remain defined to allow ACPI drivers time to migrate to the new macros.

Implemented the ACPI_CPU_FLAGS type to simplify host OS integration of the Acquire/Release Lock OSL interfaces.

Fixed a problem where Alias ASL operators are sometimes not correctly resolved, in both the interpreter and the iASL compiler.

Fixed several problems with the implementation of the ConcatenateResTemplate ASL operator. As per the ACPI specification, zero length buffers are now treated as a single EndTag. One-length buffers always cause a fatal exception. Non-zero length buffers that do not end with a full 2-byte EndTag cause a fatal exception.

Fixed a possible structure overwrite in the AcpiGetObjectInfo external interface. (With assistance from Thomas Renninger)

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 83.1K Code, 18.4K Data, 101.5K Total

Debug Version: 163.2K Code, 66.2K Data, 229.4K Total

Current Release:

Non-Debug Version: 81.0K Code, 17.9K Data, 98.9K Total

Debug Version: 161.3K Code, 65.7K Data, 227.0K Total

2) iASL Compiler/Disassembler:

Fixed an internal error that was generated for any forward references to ASL Alias objects.

13 January 2006. Summary of changes for version 20060113:

1) ACPI CA Core Subsystem:

Added 2006 copyright to all module headers and signons. This affects virtually every file in the ACPI CA core subsystem, iASL compiler, and the utilities.

Enhanced the ACPI CA error reporting in order to simplify user migration to the non-debug version of ACPI CA. Replaced all instances of the `ACPI_DEBUG_PRINT` macro invoked at the `ACPI_DB_ERROR` and `ACPI_DB_WARN` debug levels with the `ACPI_REPORT_ERROR` and `ACPI_REPORT_WARNING` macros, respectively. This preserves all error and warning messages in the non-debug version of the ACPI CA code (this has been referred to as the "debug lite" option.) Over 200 cases were converted to create a total of over 380 error/warning messages across the ACPI CA code. This increases the code and data size of the default non-debug version of the code somewhat (about 13K), but all error/warning reporting may be disabled if desired (and code eliminated) by specifying the `ACPI_NO_ERROR_MESSAGES` compile-time configuration option. The size of the debug version of ACPI CA remains about the same.

Fixed a memory leak within the AML Debugger "Set" command. One object was not properly deleted for every successful invocation of the command.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the `apica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.6K Code, 12.3K Data, 88.9K Total

Debug Version: 163.7K Code, 67.5K Data, 231.2K Total

Current Release:

Non-Debug Version: 83.1K Code, 18.4K Data, 101.5K Total

Debug Version: 163.2K Code, 66.2K Data, 229.4K Total

2) iASL Compiler/Disassembler:

The compiler now officially supports the ACPI 3.0a specification that was released on December 30, 2005. (Specification is available at www.acpi.info)

16 December 2005. Summary of changes for version 20051216:

1) ACPI CA Core Subsystem:

Implemented optional support to allow unresolved names within ASL Package objects. A null object is inserted in the package when a named reference cannot be located in the current namespace. Enabled via the interpreter slack flag, this should eliminate AE_NOT_FOUND exceptions seen on machines that contain such code.

Implemented an optimization to the initialization sequence that can improve boot time. During ACPI device initialization, the _STA method is now run if and only if the _INI method exists. The _STA method is used to determine if the device is present; An _INI can only be run if _STA returns present, but it is a waste of time to run the _STA method if the _INI does not exist. (Prototype and assistance from Dong Wei)

Implemented use of the C99 uintptr_t for the pointer casting macros if it is available in the current compiler. Otherwise, the default (void *) cast is used as before.

Fixed some possible memory leaks found within the execution path of the Break, Continue, If, and CreateField operators. (Valery Podrezov)

Fixed a problem introduced in the 20051202 release where an exception is generated during method execution if a control method attempts to declare another method.

Moved resource descriptor string constants that are used by both the AML disassembler and AML debugger to the common utilities directory so that these components are independent.

Implemented support in the AcpiExec utility (-e switch) to globally ignore exceptions during control method execution (method is not aborted.)

Added the rsinfo.c source file to the AcpiExec makefile for Linux/Unix generation.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.3K Code, 12.3K Data, 88.6K Total

Debug Version: 163.2K Code, 67.4K Data, 230.6K Total

Current Release:

Non-Debug Version: 76.6K Code, 12.3K Data, 88.9K Total

Debug Version: 163.7K Code, 67.5K Data, 231.2K Total

2) iASL Compiler/Disassembler:

Fixed a problem where a CPU stack overflow fault could occur if a recursive method call was made from within a Return statement.

02 December 2005. Summary of changes for version 20051202:

1) ACPI CA Core Subsystem:

Modified the parsing of control methods to no longer create namespace objects during the first pass of the parse. Objects are now created only during the execute phase, at the moment the namespace creation operator is encountered in the AML (Name, OperationRegion, CreateByteField, etc.) This should eliminate ALREADY_EXISTS exceptions seen on some machines where reentrant control methods are protected by an AML mutex. The mutex will now correctly block multiple threads from attempting to create the same object more than once.

Increased the number of available Owner Ids for namespace object tracking from 32 to 255. This should eliminate the OWNER_ID_LIMIT exceptions seen on some machines with a large number of ACPI tables (either static or dynamic).

Fixed a problem with the AcpiExec utility where a fault could occur when the -b switch (batch mode) is used.

Enhanced the namespace dump routine to output the owner ID for each namespace object.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.3K Code, 12.3K Data, 88.6K Total

Debug Version: 163.0K Code, 67.4K Data, 230.4K Total

Current Release:

Non-Debug Version: 76.3K Code, 12.3K Data, 88.6K Total

Debug Version: 163.2K Code, 67.4K Data, 230.6K Total

2) iASL Compiler/Disassembler:

Fixed a parse error during compilation of certain Switch/Case constructs. To simplify the parse, the grammar now allows for multiple Default statements and this error is now detected and flagged during the analysis phase.

Disassembler: The disassembly now includes the contents of the original table header within a comment at the start of the file. This includes the name and version of the original ASL compiler.

17 November 2005. Summary of changes for version 20051117:

1) ACPI CA Core Subsystem:

Fixed a problem in the AML parser where the method thread count could be decremented below zero if any errors occurred during the method parse phase. This should eliminate AE_AML_METHOD_LIMIT exceptions seen on some machines. This also fixed a related regression with the mechanism that detects and corrects methods that cannot properly handle reentrancy (related to the deployment of the new OwnerId mechanism.)

Eliminated the pre-parsing of control methods (to detect errors) during table load. Related to the problem above, this was causing unwind issues if any errors occurred during the parse, and it seemed to be overkill. A table load should not be aborted if there are problems with any single control method, thus rendering this feature rather pointless.

Fixed a problem with the new table-driven resource manager where an internal buffer overflow could occur for small resource templates.

Implemented a new external interface, AcpiGetVendorResource. This interface will find and return a vendor-defined resource descriptor within a _CRS or _PRS method via an ACPI 3.0 UUID match. With assistance from Bjorn Helgaas.

Removed the length limit (200) on string objects as per the upcoming ACPI 3.0A specification. This affects the following areas of the interpreter: 1) any implicit conversion of a Buffer to a String, 2) a String object result of the ASL Concatenate operator, 3) the String object result of the ASL ToString operator.

Fixed a problem in the Windows OS interface layer (OSL) where a WAIT_FOREVER on a semaphore object would incorrectly timeout. This allows the multithreading features of the AcpiExec utility to work properly under Windows.

Updated the Linux makefiles for the iASL compiler and AcpiExec to include

the recently added file named "utresrc.c".

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.2K Code, 12.3K Data, 88.5K Total

Debug Version: 163.0K Code, 67.4K Data, 230.4K Total

Current Release:

Non-Debug Version: 76.3K Code, 12.3K Data, 88.6K Total

Debug Version: 163.0K Code, 67.4K Data, 230.4K Total

2) iASL Compiler/Disassembler:

Removed the limit (200) on string objects as per the upcoming ACPI 3.0A specification. For the iASL compiler, this means that string literals within the source ASL can be of any length.

Enhanced the listing output to dump the AML code for resource descriptors immediately after the ASL code for each descriptor, instead of in a block at the end of the entire resource template.

Enhanced the compiler debug output to dump the entire original parse tree constructed during the parse phase, before any transforms are applied to the tree. The transformed tree is dumped also.

02 November 2005. Summary of changes for version 20051102:

1) ACPI CA Core Subsystem:

Modified the subsystem initialization sequence to improve GPE support. The GPE initialization has been split into two parts in order to defer execution of the _PRW methods (Power Resources for Wake) until after the hardware is fully initialized and the SCI handler is installed. This allows the _PRW methods to access fields protected by the Global Lock. This will fix systems where a NO_GLOBAL_LOCK exception has been seen during initialization.

Converted the ACPI internal object disassemble and display code within the AML debugger to fully table-driven operation, reducing code size and increasing maintainability.

Fixed a regression with the ConcatenateResTemplate() ASL operator introduced in the 20051021 release.

Implemented support for "local" internal ACPI object types within the debugger "Object" command and the AcpiWalkNamespace external interfaces. These local types include RegionFields, BankFields, IndexFields, Alias, and reference objects.

Moved common AML resource handling code into a new file, "utresrc.c". This code is shared by both the Resource Manager and the AML Debugger.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.1K Code, 12.2K Data, 88.3K Total

Debug Version: 163.5K Code, 67.0K Data, 230.5K Total

Current Release:

Non-Debug Version: 76.2K Code, 12.3K Data, 88.5K Total

Debug Version: 163.0K Code, 67.4K Data, 230.4K Total

2) iASL Compiler/Disassembler:

Fixed a problem with very large initializer lists (more than 4000 elements) for both Buffer and Package objects where the parse stack could overflow.

Enhanced the pre-compile source code scan for non-ASCII characters to ignore characters within comment fields. The scan is now always performed and is no longer optional, detecting invalid characters within a source file immediately rather than during the parse phase or later.

Enhanced the ASL grammar definition to force early reductions on all list-style grammar elements so that the overall parse stack usage is greatly reduced. This should improve performance and reduce the possibility of parse stack overflow.

Eliminated all reduce/reduce conflicts in the iASL parser generation. Also, with the addition of a %expected statement, the compiler generates from source with no warnings.

Fixed a possible segment fault in the disassembler if the input filename does not contain a ".dot" extension (Thomas Renninger).

21 October 2005. Summary of changes for version 20051021:

1) ACPI CA Core Subsystem:

Implemented support for the EM64T and other x86-64 processors. This essentially entails recognizing that these processors support non-aligned memory transfers. Previously, all 64-bit processors were assumed to lack hardware support for non-aligned transfers.

Completed conversion of the Resource Manager to nearly full table-driven operation. Specifically, the resource conversion code (convert AML to internal format and the reverse) and the debug code to dump internal resource descriptors are fully table-driven, reducing code and data size and improving maintainability.

The OSL interfaces for Acquire and Release Lock now use a 64-bit flag word on 64-bit processors instead of a fixed 32-bit word. (With assistance from Alexey Starikovskiy)

Implemented support within the resource conversion code for the Type-Specific byte within the various ACPI 3.0 *WordSpace macros.

Fixed some issues within the resource conversion code for the type-specific flags for both Memory and I/O address resource descriptors. For Memory, implemented support for the MTP and TTP flags. For I/O, split the TRS and TTP flags into two separate fields.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.1K Code, 12.1K Data, 89.2K Total

Debug Version: 168.0K Code, 68.3K Data, 236.3K Total

Current Release:

Non-Debug Version: 76.1K Code, 12.2K Data, 88.3K Total

Debug Version: 163.5K Code, 67.0K Data, 230.5K Total

2) iASL Compiler/Disassembler:

Relaxed a compiler restriction that disallowed a ResourceIndex byte if the corresponding ResourceSource string was not also present in a resource descriptor declaration. This restriction caused problems with existing AML/ASL code that includes the Index byte without the string. When such AML was disassembled, it could not be compiled without modification. Further, the modified code created a resource template with a different size than the original, breaking code that used fixed offsets into the resource template buffer.

Removed a recent feature of the disassembler to ignore a lone ResourceIndex byte. This byte is now emitted if present so that the exact AML can be reproduced when the disassembled code is recompiled.

Improved comments and text alignment for the resource descriptor code emitted by the disassembler.

Implemented disassembler support for the ACPI 3.0 AccessSize field within a Register() resource descriptor.

30 September 2005. Summary of changes for version 20050930:

1) ACPI CA Core Subsystem:

Completed a major overhaul of the Resource Manager code - specifically, optimizations in the area of the AML/internal resource conversion code. The code has been optimized to simplify and eliminate duplicated code, CPU stack use has been decreased by optimizing function parameters and local variables, and naming conventions across the manager have been standardized for clarity and ease of maintenance (this includes function, parameter, variable, and struct/typedef names.) The update may force changes in some driver code, depending on how resources are handled by the host OS.

All Resource Manager dispatch and information tables have been moved to a single location for clarity and ease of maintenance. One new file was created, named "rsinfo.c".

The ACPI return macros (return_ACPI_STATUS, etc.) have been modified to guarantee that the argument is not evaluated twice, making them less prone to macro side-effects. However, since there exists the possibility of additional stack use if a particular compiler cannot optimize them (such as in the debug generation case), the original macros are optionally available. Note that some invocations of the return_VALUE macro may now cause size mismatch warnings; the return_UINT8 and return_UINT32 macros are provided to eliminate these. (From Randy Dunlap)

Implemented a new mechanism to enable debug tracing for individual control methods. A new external interface, AcpiDebugTrace, is provided to enable

this mechanism. The intent is to allow the host OS to easily enable and disable tracing for problematic control methods. This interface can be easily exposed to a user or debugger interface if desired. See the file `psxface.c` for details.

`AcpiUtCallocate` will now return a valid pointer if a length of zero is specified - a length of one is used and a warning is issued. This matches the behavior of `AcpiUtAllocate`.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.5K Code, 12.0K Data, 89.5K Total

Debug Version: 168.1K Code, 68.4K Data, 236.5K Total

Current Release:

Non-Debug Version: 77.1K Code, 12.1K Data, 89.2K Total

Debug Version: 168.0K Code, 68.3K Data, 236.3K Total

2) iASL Compiler/Disassembler:

A remark is issued if the effective compile-time length of a package or buffer is zero. Previously, this was a warning.

16 September 2005. Summary of changes for version 20050916:

1) ACPI CA Core Subsystem:

Fixed a problem within the Resource Manager where support for the Generic Register descriptor was not fully implemented. This descriptor is now fully recognized, parsed, disassembled, and displayed.

Completely restructured the Resource Manager code to utilize table-driven dispatch and lookup, eliminating many of the large `switch()` statements. This reduces overall subsystem code size and code complexity. Affects the resource parsing and construction, disassembly, and debug dump output.

Cleaned up and restructured the debug dump output for all resource descriptors. Improved readability of the output and reduced code size.

Fixed a problem where changes to internal data structures caused the

optional ACPI_MUTEX_DEBUG code to fail compilation if specified.

Code and Data Size: The current and previous library sizes for the core subsystem are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 32-bit compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.4K Code, 11.8K Data, 90.2K Total

Debug Version: 169.6K Code, 69.9K Data, 239.5K Total

Current Release:

Non-Debug Version: 77.5K Code, 12.0K Data, 89.5K Total

Debug Version: 168.1K Code, 68.4K Data, 236.5K Total

2) iASL Compiler/Disassembler:

Updated the disassembler to automatically insert an EndDependentFn() macro into the ASL stream if this macro is missing in the original AML code, simplifying compilation of the resulting ASL module.

Fixed a problem in the disassembler where a disassembled ResourceSource string (within a large resource descriptor) was not surrounded by quotes and not followed by a comma, causing errors when the resulting ASL module was compiled. Also, escape sequences within a ResourceSource string are now handled correctly (especially "\\")

02 September 2005. Summary of changes for version 20050902:

1) ACPI CA Core Subsystem:

Fixed a problem with the internal Owner ID allocation and deallocation mechanisms for control method execution and recursive method invocation. This should eliminate the OWNER_ID_LIMIT exceptions and "Invalid OwnerId" messages seen on some systems. Recursive method invocation depth is currently limited to 255. (Alexey Starikovskiy)

Completely eliminated all vestiges of support for the "module-level executable code" until this support is fully implemented and debugged. This should eliminate the NO_RETURN_VALUE exceptions seen during table load on some systems that invoke this support.

Fixed a problem within the resource manager code where the transaction flags for a 64-bit address descriptor were handled incorrectly in the type-

specific flag byte.

Consolidated duplicate code within the address descriptor resource manager code, reducing overall subsystem code size.

Fixed a fault when using the AML debugger "disassemble" command to disassemble individual control methods.

Removed references to the "release_current" directory within the Unix release package.

Code and Data Size: The current and previous core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler. These values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.6K Code, 11.7K Data, 90.3K Total

Debug Version: 170.0K Code, 69.9K Data, 239.9K Total

Current Release:

Non-Debug Version: 78.4K Code, 11.8K Data, 90.2K Total

Debug Version: 169.6K Code, 69.9K Data, 239.5K Total

2) iASL Compiler/Disassembler:

Implemented an error check for illegal duplicate values in the interrupt and dma lists for the following ASL macros: `Dma()`, `Irq()`, `IrqNoFlags()`, and `Interrupt()`.

Implemented error checking for the `Irq()` and `IrqNoFlags()` macros to detect too many values in the interrupt list (16 max) and invalid values in the list (range 0 - 15)

The maximum length string literal within an ASL file is now restricted to 200 characters as per the ACPI specification.

Fixed a fault when using the `-ln` option (generate namespace listing).

Implemented an error check to determine if a `DescriptorName` within a resource descriptor has already been used within the current scope.

15 August 2005. Summary of changes for version 20050815:

1) ACPI CA Core Subsystem:

Implemented a full bitwise compare to determine if a table load request is attempting to load a duplicate table. The compare is performed if the table signatures and table lengths match. This will allow different tables with the same OEM Table ID and revision to be loaded - probably against the ACPI specification, but discovered in the field nonetheless.

Added the changes.txt logfile to each of the zipped release packages.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.6K Code, 11.7K Data, 90.3K Total

Debug Version: 167.0K Code, 69.9K Data, 236.9K Total

Current Release:

Non-Debug Version: 78.6K Code, 11.7K Data, 90.3K Total

Debug Version: 170.0K Code, 69.9K Data, 239.9K Total

2) iASL Compiler/Disassembler:

Fixed a problem where incorrect AML code could be generated for Package objects if optimization is disabled (via the -oa switch).

Fixed a problem with where incorrect AML code is generated for variable-length packages when the package length is not specified and the number of initializer values is greater than 255.

29 July 2005. Summary of changes for version 20050729:

1) ACPI CA Core Subsystem:

Implemented support to ignore an attempt to install/load a particular ACPI table more than once. Apparently there exists BIOS code that repeatedly attempts to load the same SSDT upon certain events. With assistance from Venkatesh Pallipadi.

Restructured the main interface to the AML parser in order to correctly handle all exceptional conditions. This will prevent leakage of the OwnerId

resource and should eliminate the AE_OWNER_ID_LIMIT exceptions seen on some machines. With assistance from Alexey Starikovskiy.

Support for "module level code" has been disabled in this version due to a number of issues that have appeared on various machines. The support can be enabled by defining ACPI_ENABLE_MODULE_LEVEL_CODE during subsystem compilation. When the issues are fully resolved, the code will be enabled by default again.

Modified the internal functions for debug print support to define the FunctionName parameter as a (const char *) for compatibility with compiler built-in macros such as __FUNCTION__, etc.

Linted the entire ACPICA source tree for both 32-bit and 64-bit.

Implemented support to display an object count summary for the AML Debugger commands Object and Methods.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.6K Code, 11.6K Data, 90.2K Total

Debug Version: 170.0K Code, 69.7K Data, 239.7K Total

Current Release:

Non-Debug Version: 78.6K Code, 11.7K Data, 90.3K Total

Debug Version: 167.0K Code, 69.9K Data, 236.9K Total

2) iASL Compiler/Disassembler:

Fixed a regression that appeared in the 20050708 version of the compiler where an error message was inadvertently emitted for invocations of the _OSI reserved control method.

08 July 2005. Summary of changes for version 20050708:

1) ACPI CA Core Subsystem:

The use of the CPU stack in the debug version of the subsystem has been considerably reduced. Previously, a debug structure was declared in every function that used the debug macros. This structure has been removed in

favor of declaring the individual elements as parameters to the debug functions. This reduces the cumulative stack use during nested execution of ACPI function calls at the cost of a small increase in the code size of the debug version of the subsystem. With assistance from Alexey Starikovskiy and Len Brown.

Added the `ACPI_GET_FUNCTION_NAME` macro to enable the compiler-dependent headers to define a macro that will return the current function name at runtime (such as `__FUNCTION__` or `_func_`, etc.) The function name is used by the debug trace output. If `ACPI_GET_FUNCTION_NAME` is not defined in the compiler-dependent header, the function name is saved on the CPU stack (one pointer per function.) This mechanism is used because apparently there exists no standard ANSI-C defined macro that returns the function name.

Redesigned and reimplemented the "Owner ID" mechanism used to track namespace objects created/deleted by ACPI tables and control method execution. A bitmap is now used to allocate and free the IDs, thus solving the wraparound problem present in the previous implementation. The size of the namespace node descriptor was reduced by 2 bytes as a result (Alexey Starikovskiy).

Removed the `UINT32_BIT` and `UINT16_BIT` types that were used for the bitfield flag definitions within the headers for the predefined ACPI tables. These have been replaced by `UINT8_BIT` in order to increase the code portability of the subsystem. If the use of `UINT8` remains a problem, we may be forced to eliminate bitfields entirely because of a lack of portability.

Enhanced the performance of the `AcpiUtUpdateObjectReference` procedure. This is a frequently used function and this improvement increases the performance of the entire subsystem (Alexey Starikovskiy).

Fixed several possible memory leaks and the inverse - premature object deletion (Alexey Starikovskiy).

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.6K Code, 11.5K Data, 90.1K Total

Debug Version: 165.2K Code, 69.6K Data, 234.8K Total

Current Release:

Non-Debug Version: 78.6K Code, 11.6K Data, 90.2K Total

Debug Version: 170.0K Code, 69.7K Data, 239.7K Total

24 June 2005. Summary of changes for version 20050624:

1) ACPI CA Core Subsystem:

Modified the new OSL cache interfaces to use `ACPI_CACHE_T` as the type for the host-defined cache object. This allows the OSL implementation to define and type this object in any manner desired, simplifying the OSL implementation. For example, `ACPI_CACHE_T` is defined as `kmem_cache_t` for Linux, and should be defined in the OS-specific header file for other operating systems as required.

Changed the interface to `AcpiOsAcquireObject` to directly return the requested object as the function return (instead of `ACPI_STATUS`.) This change was made for performance reasons, since this is the purpose of the interface in the first place. `AcpiOsAcquireObject` is now similar to the `AcpiOsAllocate` interface.

Implemented a new AML debugger command named `Businfo`. This command displays information about all devices that have an associate `_PRT` object. The `_ADR`, `_HID`, `_UID`, and `_CID` are displayed for these devices.

Modified the initialization sequence in `AcpiInitializeSubsystem` to call the OSL interface `AcpiOsInitialize` first, before any local initialization. This change was required because the global initialization now calls OSL interfaces.

Enhanced the `Dump` command to display the entire contents of Package objects (including all sub-objects and their values.)

Restructured the code base to split some files because of size and/or because the code logically belonged in a separate file. New files are listed below. All makefiles and project files included in the ACPI CA release have been updated.

```
utilities/utcache.c      /* Local cache interfaces */
utilities/utmutex.c     /* Local mutex support */
utilities/utstate.c     /* State object support */
interpreter/parser/psloop.c /* Main AML parse loop */
```

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.3K Code, 11.6K Data, 89.9K Total

Debug Version: 164.0K Code, 69.1K Data, 233.1K Total

Current Release:

Non-Debug Version: 78.6K Code, 11.5K Data, 90.1K Total

Debug Version: 165.2K Code, 69.6K Data, 234.8K Total

2) iASL Compiler/Disassembler:

Fixed a regression introduced in version 20050513 where the use of a Package object within a Case() statement caused a compile time exception. The original behavior has been restored (a Match() operator is emitted.)

17 June 2005. Summary of changes for version 20050617:

1) ACPI CA Core Subsystem:

Moved the object cache operations into the OS interface layer (OSL) to allow the host OS to handle these operations if desired (for example, the Linux OSL will invoke the slab allocator). This support is optional; the compile time define `ACPI_USE_LOCAL_CACHE` may be used to utilize the original cache code in the ACPI CA core. The new OSL interfaces are shown below. See `utalloc.c` for an example implementation, and `acpiosxf.h` for the exact interface definitions. With assistance from Alexey Starikovskiy.

`AcpiOsCreateCache`

`AcpiOsDeleteCache`

`AcpiOsPurgeCache`

`AcpiOsAcquireObject`

`AcpiOsReleaseObject`

Modified the interfaces to `AcpiOsAcquireLock` and `AcpiOsReleaseLock` to return and restore a flags parameter. This fits better with many OS lock models.

Note: the current execution state (interrupt handler or not) is no longer passed to these interfaces. If necessary, the OSL must determine this state by itself, a simple and fast operation. With assistance from Alexey Starikovskiy.

Fixed a problem in the ACPI table handling where a valid XSDT was assumed present if the revision of the RSDP was 2 or greater. According to the ACPI specification, the XSDT is optional in all cases, and the table manager therefore now checks for both an `RSDP >=2` and a valid XSDT pointer. Otherwise, the RSDT pointer is used. Some ACPI 2.0 compliant BIOSs contain only the RSDT.

Fixed an interpreter problem with the `Mid()` operator in the case of an input string where the resulting output string is of zero length. It now correctly

returns a valid, null terminated string object instead of a string object with a null pointer.

Fixed a problem with the control method argument handling to allow a store to an Arg object that already contains an object of type Device. The Device object is now correctly overwritten. Previously, an error was returned.

Enhanced the debugger Find command to emit object values in addition to the found object pathnames. The output format is the same as the dump namespace command.

Enhanced the debugger Set command. It now has the ability to set the value of any Named integer object in the namespace (Previously, only method locals and args could be set.)

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.1K Code, 11.6K Data, 89.7K Total

Debug Version: 164.0K Code, 69.3K Data, 233.3K Total

Current Release:

Non-Debug Version: 78.3K Code, 11.6K Data, 89.9K Total

Debug Version: 164.0K Code, 69.1K Data, 233.1K Total

2) iASL Compiler/Disassembler:

Fixed a regression in the disassembler where if/else/while constructs were output incorrectly. This problem was introduced in the previous release (20050526). This problem also affected the single-step disassembly in the debugger.

Fixed a problem where compiling the reserved _OSI method would randomly (but rarely) produce compile errors.

Enhanced the disassembler to emit compilable code in the face of incorrect AML resource descriptors. If the optional ResourceSourceIndex is present, but the ResourceSource is not, do not emit the ResourceSourceIndex in the disassembly. Otherwise, the resulting code cannot be compiled without errors.

26 May 2005. Summary of changes for version 20050526:

1) ACPI CA Core Subsystem:

Implemented support to execute Type 1 and Type 2 AML opcodes appearing at the module level (not within a control method.) These opcodes are executed exactly once at the time the table is loaded. This type of code was legal up until the release of ACPI 2.0B (2002) and is now supported within ACPI CA in order to provide backwards compatibility with earlier BIOS implementations. This eliminates the "Encountered executable code at module level" warning that was previously generated upon detection of such code.

Fixed a problem in the interpreter where an AE_NOT_FOUND exception could inadvertently be generated during the lookup of namespace objects in the second pass parse of ACPI tables and control methods. It appears that this problem could occur during the resolution of forward references to namespace objects.

Added the ACPI_MUTEX_DEBUG #ifdef to the AcpiUtReleaseMutex function, corresponding to the same #ifdef in the AcpiUtAcquireMutex function. This allows the deadlock detection debug code to be compiled out in the normal case, improving mutex performance (and overall subsystem performance) considerably.

Implemented a handful of miscellaneous fixes for possible memory leaks on error conditions and error handling control paths. These fixes were suggested by FreeBSD and the Coverity Prevent source code analysis tool.

Added a check for a null RSDT pointer in AcpiGetFirmwareTable (tbxfroot.c) to prevent a fault in this error case.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.2K Code, 11.6K Data, 89.8K Total

Debug Version: 163.7K Code, 69.3K Data, 233.0K Total

Current Release:

Non-Debug Version: 78.1K Code, 11.6K Data, 89.7K Total

Debug Version: 164.0K Code, 69.3K Data, 233.3K Total

2) iASL Compiler/Disassembler:

Implemented support to allow Type 1 and Type 2 ASL operators to appear at the module level (not within a control method.) These operators will be executed once at the time the table is loaded. This type of code was legal up until the release of ACPI 2.0B (2002) and is now supported by the iASL compiler in order to provide backwards compatibility with earlier BIOS ASL code.

The ACPI integer width (specified via the table revision ID or the -r override, 32 or 64 bits) is now used internally during compile-time constant folding to ensure that constants are truncated to 32 bits if necessary. Previously, the revision ID value was only emitted in the AML table header.

An error message is now generated for the Mutex and Method operators if the SyncLevel parameter is outside the legal range of 0 through 15.

Fixed a problem with the Method operator ParameterTypes list handling (ACPI 3.0). Previously, more than 2 types or 2 arguments generated a syntax error. The actual underlying implementation of method argument typechecking is still under development, however.

13 May 2005. Summary of changes for version 20050513:

1) ACPI CA Core Subsystem:

Implemented support for PCI Express root bridges -- added support for device PNP0A08 in the root bridge search within AcpiEvPciConfigRegionSetup.

The interpreter now automatically truncates incoming 64-bit constants to 32 bits if currently executing out of a 32-bit ACPI table (Revision < 2). This also affects the iASL compiler constant folding. (Note: as per below, the iASL compiler no longer allows 64-bit constants within 32-bit tables.)

Fixed a problem where string and buffer objects with "static" pointers (pointers to initialization data within an ACPI table) were not handled consistently. The internal object copy operation now always copies the data to a newly allocated buffer, regardless of whether the source object is static or not.

Fixed a problem with the FromBCD operator where an implicit result conversion was improperly performed while storing the result to the target operand. Since this is an "explicit conversion" operator, the implicit conversion should never be performed on the output.

Fixed a problem with the CopyObject operator where a copy to an existing named object did not always completely overwrite the existing object stored

at name. Specifically, a buffer-to-buffer copy did not delete the existing buffer.

Replaced "InterruptLevel" with "InterruptNumber" in all GPE interfaces and structs for consistency.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.2K Code, 11.6K Data, 89.8K Total

Debug Version: 163.7K Code, 69.3K Data, 233.0K Total

Current Release: (Same sizes)

Non-Debug Version: 78.2K Code, 11.6K Data, 89.8K Total

Debug Version: 163.7K Code, 69.3K Data, 233.0K Total

2) iASL Compiler/Disassembler:

The compiler now emits a warning if an attempt is made to generate a 64-bit integer constant from within a 32-bit ACPI table (Revision < 2). The integer is truncated to 32 bits.

Fixed a problem with large package objects: if the static length of the package is greater than 255, the "variable length package" opcode is emitted. Previously, this caused an error. This requires an update to the ACPI spec, since it currently (incorrectly) states that packages larger than 255 elements are not allowed.

The disassembler now correctly handles variable length packages and packages larger than 255 elements.

08 April 2005. Summary of changes for version 20050408:

1) ACPI CA Core Subsystem:

Fixed three cases in the interpreter where an "index" argument to an ASL function was still (internally) 32 bits instead of the required 64 bits. This was the Index argument to the Index, Mid, and Match operators.

The "strupr" function is now permanently local (AcpiUtStrupr), since this is not a POSIX-defined function and not present in most kernel-level C

libraries. All references to the C library `strupr` function have been removed from the headers.

Completed the deployment of static functions/prototypes. All prototypes with the static attribute have been moved from the headers to the owning C file.

Implemented an extract option (-e) for the `AcpiBin` utility (AML binary utility). This option allows the utility to extract individual ACPI tables from the output of `AcpiDmp`. It provides the same functionality of the `acpixtract.pl` perl script without the worry of setting the correct perl options. `AcpiBin` runs on Windows and has not yet been generated/validated in the Linux/Unix environment (but should be soon).

Updated and fixed the table dump option for `AcpiBin` (-d). This option converts a single ACPI table to a hex/ascii file, similar to the output of `AcpiDmp`.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.0K Code, 11.6K Data, 89.6K Total

Debug Version: 163.5K Code, 69.3K Data, 232.8K Total

Current Release:

Non-Debug Version: 78.2K Code, 11.6K Data, 89.8K Total

Debug Version: 163.7K Code, 69.3K Data, 233.0K Total

2) `iASL` Compiler/Disassembler:

Disassembler fix: Added a check to ensure that the table length found in the ACPI table header within the input file is not longer than the actual input file size. This indicates some kind of file or table corruption.

29 March 2005. Summary of changes for version 20050329:

1) ACPI CA Core Subsystem:

An error is now generated if an attempt is made to create a Buffer Field of length zero (A `CreateField` with a length operand of zero.)

The interpreter now issues a warning whenever executable code at the module

level is detected during ACPI table load. This will give some idea of the prevalence of this type of code.

Implemented support for references to named objects (other than control methods) within package objects.

Enhanced package object output for the debug object. Package objects are now completely dumped, showing all elements.

Enhanced miscellaneous object output for the debug object. Any object can now be written to the debug object (for example, a device object can be written, and the type of the object will be displayed.)

The "static" qualifier has been added to all local functions across both the core subsystem and the iASL compiler.

The number of "long" lines (> 80 chars) within the source has been significantly reduced, by about 1/3.

Cleaned up all header files to ensure that all CA/iASL functions are prototyped (even static functions) and the formatting is consistent.

Two new header files have been added, acopcode.h and acnames.h.

Removed several obsolete functions that were no longer used.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 165.4K Code, 69.7K Data, 236.1K Total

Current Release:

Non-Debug Version: 78.0K Code, 11.6K Data, 89.6K Total

Debug Version: 163.5K Code, 69.3K Data, 232.8K Total

2) iASL Compiler/Disassembler:

Fixed a problem with the resource descriptor generation/support. For the ResourceSourceIndex and the ResourceSource fields, both must be present, or both must be not present - can't have one without the other.

The compiler now returns non-zero from the main procedure if any errors have occurred during the compilation.

09 March 2005. Summary of changes for version 20050309:

1) ACPI CA Core Subsystem:

The string-to-buffer implicit conversion code has been modified again after a change to the ACPI specification. In order to match the behavior of the other major ACPI implementation, the target buffer is no longer truncated if the source string is smaller than an existing target buffer. This change requires an update to the ACPI spec, and should eliminate the recent AE_AML_BUFFER_LIMIT issues.

The "implicit return" support was rewritten to a new algorithm that solves the general case. Rather than attempt to determine when a method is about to exit, the result of every ASL operator is saved momentarily until the very next ASL operator is executed. Therefore, no matter how the method exits, there will always be a saved implicit return value. This feature is only enabled with the AcpiGbl_EnableInterpreterSlack flag, and should eliminate AE_AML_NO_RETURN_VALUE errors when enabled.

Implemented implicit conversion support for the predicate (operand) of the If, Else, and While operators. String and Buffer arguments are automatically converted to Integers.

Changed the string-to-integer conversion behavior to match the new ACPI errata: "If no integer object exists, a new integer is created. The ASCII string is interpreted as a hexadecimal constant. Each string character is interpreted as a hexadecimal value ('0'-'9', 'A'-'F', 'a', 'f'), starting with the first character as the most significant digit, and ending with the first non-hexadecimal character or end-of-string." This means that the first non-hex character terminates the conversion and this is the code that was changed.

Fixed a problem where the ObjectType operator would fail (fault) when used on an Index of a Package which pointed to a null package element. The operator now properly returns zero (Uninitialized) in this case.

Fixed a problem where the While operator used excessive memory by not properly popping the result stack during execution. There was no memory leak after execution, however. (Code provided by Valery Podrezov.)

Fixed a problem where references to control methods within Package objects caused the method to be invoked, instead of producing a reference object

pointing to the method.

Restructured and simplified the pswalk.c module (AcpiPsDeleteParseTree) to improve performance and reduce code size. (Code provided by Alexey Starikovskiy.)

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 165.4K Code, 69.6K Data, 236.0K Total

Current Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 165.4K Code, 69.7K Data, 236.1K Total

2) iASL Compiler/Disassembler:

Fixed a problem with the Return operator with no arguments. Since the AML grammar for the byte encoding requires an operand for the Return opcode, the compiler now emits a Return(Zero) for this case. An ACPI specification update has been written for this case.

For tables other than the DSDT, namepath optimization is automatically disabled. This is because SSDTs can be loaded anywhere in the namespace, the compiler has no knowledge of where, and thus cannot optimize namepaths.

Added "ProcessorObj" to the ObjectTypeKeyword list. This object type was inadvertently omitted from the ACPI specification, and will require an update to the spec.

The source file scan for ASCII characters is now optional (-a). This change was made because some vendors place non-ascii characters within comments. However, the scan is simply a brute-force byte compare to ensure all characters in the file are in the range 0x00 to 0x7F.

Fixed a problem with the CondRefOf operator where the compiler was inappropriately checking for the existence of the target. Since the point of the operator is to check for the existence of the target at run-time, the compiler no longer checks for the target existence.

Fixed a problem where errors generated from the internal AML interpreter

during constant folding were not handled properly, causing a fault.

Fixed a problem with overly aggressive range checking for the Stall operator. The valid range (max 255) is now only checked if the operand is of type Integer. All other operand types cannot be statically checked.

Fixed a problem where control method references within the RefOf, DeRefOf, and ObjectType operators were not treated properly. They are now treated as actual references, not method invocations.

Fixed and enhanced the "list namespace" option (-ln). This option was broken a number of releases ago.

Improved error handling for the Field, IndexField, and BankField operators. The compiler now cleanly reports and recovers from errors in the field component (FieldUnit) list.

Fixed a disassembler problem where the optional ResourceDescriptor fields TRS and TTP were not always handled correctly.

Disassembler - Comments in output now use "/" instead of "/*"

28 February 2005. Summary of changes for version 20050228:

1) ACPI CA Core Subsystem:

Fixed a problem where the result of an Index() operator (an object reference) must increment the reference count on the target object for the life of the object reference.

Implemented AML Interpreter and Debugger support for the new ACPI 3.0 Extended Address (IO, Memory, Space), QwordSpace, DwordSpace, and WordSpace resource descriptors.

Implemented support in the _OSI method for the ACPI 3.0 "Extended Address Space Descriptor" string, indicating interpreter support for the descriptors above.

Implemented header support for the new ACPI 3.0 FADT flag bits.

Implemented header support for the new ACPI 3.0 PCI Express bits for the PM1 status/enable registers.

Updated header support for the MADT processor local Apic struct and MADT platform interrupt source struct for new ACPI 3.0 fields.

Implemented header support for the SRAT and SLIT ACPI tables.

Implemented the -s switch in AcpiExec to enable the "InterpreterSlack" flag at runtime.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.2K Code, 11.5K Data, 89.7K Total

Debug Version: 164.9K Code, 69.2K Data, 234.1K Total

Current Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 165.4K Code, 69.6K Data, 236.0K Total

2) iASL Compiler/Disassembler:

Fixed a problem with the internal 64-bit String-to-integer conversion with strings less than two characters long.

Fixed a problem with constant folding where the result of the Index() operator can not be considered a constant. This means that Index() cannot be a type3 opcode and this will require an update to the ACPI specification.

Disassembler: Implemented support for the TTP, MTP, and TRS resource descriptor fields. These fields were inadvertently ignored and not output in the disassembly of the resource descriptor.

11 February 2005. Summary of changes for version 20050211:

1) ACPI CA Core Subsystem:

Implemented ACPI 3.0 support for implicit conversion within the Match() operator. MatchObjects can now be of type integer, buffer, or string instead of just type integer. Package elements are implicitly converted to the type of the MatchObject. This change aligns the behavior of Match() with the behavior of the other logical operators (LLess(), etc.) It also requires an errata change to the ACPI specification as this support was intended for ACPI 3.0, but was inadvertently omitted.

Fixed a problem with the internal implicit "to buffer" conversion. Strings

that are converted to buffers will cause buffer truncation if the string is smaller than the target buffer. Integers that are converted to buffers will not cause buffer truncation, only zero extension (both as per the ACPI spec.) The problem was introduced when code was added to truncate the buffer, but this should not be performed in all cases, only the string case.

Fixed a problem with the Buffer and Package operators where the interpreter would get confused if two such operators were used as operands to an ASL operator (such as LLess(Buffer(1){0},Buffer(1){1})). The internal result stack was not being popped after the execution of these operators, resulting in an AE_NO_RETURN_VALUE exception.

Fixed a problem with constructs of the form Store(Index(...),...). The reference object returned from Index was inadvertently resolved to an actual value. This problem was introduced in version 20050114 when the behavior of Store() was modified to restrict the object types that can be used as the source operand (to match the ACPI specification.)

Reduced excessive stack use within the AcpiGetObjectInfo procedure.

Added a fix to aclinux.h to allow generation of AcpiExec on Linux.

Updated the AcpiSrc utility to add the FADT_DESCRIPTOR_REV2_MINUS struct.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.1K Code, 11.5K Data, 89.6K Total

Debug Version: 164.8K Code, 69.2K Data, 234.0K Total

Current Release:

Non-Debug Version: 78.2K Code, 11.5K Data, 89.7K Total

Debug Version: 164.9K Code, 69.2K Data, 234.1K Total

2) iASL Compiler/Disassembler:

Fixed a code generation problem in the constant folding optimization code where incorrect code was generated if a constant was reduced to a buffer object (i.e., a reduced type 5 opcode.)

Fixed a typechecking problem for the ToBuffer operator. Caused by an incorrect return type in the internal opcode information table.

25 January 2005. Summary of changes for version 20050125:

1) ACPI CA Core Subsystem:

Fixed a recently introduced problem with the Global Lock where the underlying semaphore was not created. This problem was introduced in version 20050114, and caused an AE_AML_NO_OPERAND exception during an Acquire() operation on _GL.

The local object cache is now optional, and is disabled by default. Both AcpiExec and the iASL compiler enable the cache because they run in user mode and this enhances their performance. #define ACPI_ENABLE_OBJECT_CACHE to enable the local cache.

Fixed an issue in the internal function AcpiUtEvaluateObject concerning the optional "implicit return" support where an error was returned if no return object was expected, but one was implicitly returned. AE_OK is now returned in this case and the implicitly returned object is deleted.

AcpiUtEvaluateObject is only occasionally used, and only to execute reserved methods such as _STA and _INI where the return type is known up front.

Fixed a few issues with the internal convert-to-integer code. It now returns an error if an attempt is made to convert a null string, a string of only blanks/tabs, or a zero-length buffer. This affects both implicit conversion and explicit conversion via the ToInteger() operator.

The internal debug code in AcpiUtAcquireMutex has been commented out. It is not needed for normal operation and should increase the performance of the entire subsystem. The code remains in case it is needed for debug purposes again.

The AcpiExec source and makefile are included in the Unix/Linux package for the first time.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.4K Code, 11.5K Data, 89.9K Total

Debug Version: 165.4K Code, 69.4K Data, 234.8K Total

Current Release:

Non-Debug Version: 78.1K Code, 11.5K Data, 89.6K Total

Debug Version: 164.8K Code, 69.2K Data, 234.0K Total

2) iASL Compiler/Disassembler:

Switch/Case support: A warning is now issued if the type of the Switch value cannot be determined at compile time. For example, Switch(Arg0) will generate the warning, and the type is assumed to be an integer. As per the ACPI spec, use a construct such as Switch(ToInteger(Arg0)) to eliminate the warning.

Switch/Case support: Implemented support for buffer and string objects as the switch value. This is an ACPI 3.0 feature, now that LEqual supports buffers and strings.

Switch/Case support: The emitted code for the LEqual() comparisons now uses the switch value as the first operand, not the second. The case value is now the second operand, and this allows the case value to be implicitly converted to the type of the switch value, not the other way around.

Switch/Case support: Temporary variables are now emitted immediately within the control method, not at the global level. This means that there are now 36 temps available per-method, not 36 temps per-module as was the case with the earlier implementation (_T_0 through _T_9 and _T_A through _T_Z.)

14 January 2005. Summary of changes for version 20050114:

Added 2005 copyright to all module headers. This affects every module in the core subsystem, iASL compiler, and the utilities.

1) ACPI CA Core Subsystem:

Fixed an issue with the String-to-Buffer conversion code where the string null terminator was not included in the buffer after conversion, but there is existing ASL that assumes the string null terminator is included. This is the root of the ACPI_AML_BUFFER_LIMIT regression. This problem was introduced in the previous version when the code was updated to correctly set the converted buffer size as per the ACPI specification. The ACPI spec is ambiguous and will be updated to specify that the null terminator must be included in the converted buffer. This also affects the ToBuffer() ASL operator.

Fixed a problem with the Mid() ASL/AML operator where it did not work correctly on Buffer objects. Newly created sub-buffers were not being marked as initialized.

Fixed a problem in AcpiTbFindTable where incorrect string compares were performed on the OemId and OemTableId table header fields. These fields are not null terminated, so strncmp is now used instead of strcmp.

Implemented a restriction on the Store() ASL/AML operator to align the behavior with the ACPI specification. Previously, any object could be used as the source operand. Now, the only objects that may be used are Integers, Buffers, Strings, Packages, Object References, and DDB Handles. If necessary, the original behavior can be restored by enabling the EnableInterpreterSlack flag.

Enhanced the optional "implicit return" support to allow an implicit return value from methods that are invoked externally via the AcpiEvaluateObject interface. This enables implicit returns from the _STA and _INI methods, for example.

Changed the Revision() ASL/AML operator to return the current version of the AML interpreter, in the YYYYMMDD format. Previously, it incorrectly returned the supported ACPI version (This is the function of the _REV method).

Updated the _REV predefined method to return the currently supported version of ACPI, now 3.

Implemented batch mode option for the AcpiExec utility (-b).

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 165.3K Code, 69.4K Data, 234.7K Total

Current Release:

Non-Debug Version: 78.4K Code, 11.5K Data, 89.9K Total

Debug Version: 165.4K Code, 69.4K Data, 234.8K Total

10 December 2004. Summary of changes for version 20041210:

ACPI 3.0 support is nearing completion in both the iASL compiler and the ACPI CA core subsystem.

1) ACPI CA Core Subsystem:

Fixed a problem in the ToDecimalString operator where the resulting string length was incorrectly calculated. The length is now calculated exactly, eliminating incorrect AE_STRING_LIMIT exceptions.

Fixed a problem in the ToHexString operator to allow a maximum 200 character string to be produced.

Fixed a problem in the internal string-to-buffer and buffer-to-buffer copy routine where the length of the resulting buffer was not truncated to the new size (if the target buffer already existed).

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 164.7K Code, 68.5K Data, 233.2K Total

Current Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 165.3K Code, 69.4K Data, 234.7K Total

2) iASL Compiler/Disassembler:

Implemented the new ACPI 3.0 resource template macros - DWordSpace, ExtendedIO, ExtendedMemory, ExtendedSpace, QWordSpace, and WordSpace. Includes support in the disassembler.

Implemented support for the new (ACPI 3.0) parameter to the Register macro, AccessSize.

Fixed a problem where the _HE resource name for the Interrupt macro was referencing bit 0 instead of bit 1.

Implemented check for maximum 255 interrupts in the Interrupt macro.

Fixed a problem with the predefined resource descriptor names where incorrect AML code was generated if the offset within the resource buffer was 0 or 1. The optimizer shortened the AML code to a single byte opcode but did not update the surrounding package lengths.

Changes to the Dma macro: All channels within the channel list must be in the range 0-7. Maximum 8 channels can be specified. BusMaster operand is

optional (default is BusMaster).

Implemented check for maximum 7 data bytes for the VendorShort macro.

The ReadWrite parameter is now optional for the Memory32 and similar macros.

03 December 2004. Summary of changes for version 20041203:

1) ACPI CA Core Subsystem:

The low-level field insertion/extraction code (exfldio) has been completely rewritten to eliminate unnecessary complexity, bugs, and boundary conditions.

Fixed a problem in the ToInteger, ToBuffer, ToHexString, and ToDecimalString operators where the input operand could be inadvertently deleted if no conversion was necessary (e.g., if the input to ToInteger was an Integer object.)

Fixed a problem with the ToDecimalString and ToHexString where an incorrect exception code was returned if the resulting string would be > 200 chars. AE_STRING_LIMIT is now returned.

Fixed a problem with the Concatenate operator where AE_OK was always returned, even if the operation failed.

Fixed a problem in oswinxf (used by AcpiExec and iASL) to allow > 128 semaphores to be allocated.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.5K Code, 11.5K Data, 90.0K Total

Debug Version: 165.2K Code, 68.6K Data, 233.8K Total

Current Release:

Non-Debug Version: 78.3K Code, 11.5K Data, 89.8K Total

Debug Version: 164.7K Code, 68.5K Data, 233.2K Total

2) iASL Compiler/Disassembler:

Fixed typechecking for the ObjectType and SizeOf operators. Problem was recently introduced in 20041119.

Fixed a problem with the ToUUID macro where the upper nybble of each buffer byte was inadvertently set to zero.

19 November 2004. Summary of changes for version 20041119:

1) ACPI CA Core Subsystem:

Fixed a problem in the internal ConvertToInteger routine where new integers were not truncated to 32 bits for 32-bit ACPI tables. This routine converts buffers and strings to integers.

Implemented support to store a value to an Index() on a String object. This is an ACPI 2.0 feature that had not yet been implemented.

Implemented new behavior for storing objects to individual package elements (via the Index() operator). The previous behavior was to invoke the implicit conversion rules if an object was already present at the index. The new behavior is to simply delete any existing object and directly store the new object. Although the ACPI specification seems unclear on this subject, other ACPI implementations behave in this manner. (This is the root of the AE_BAD_HEX_CONSTANT issue.)

Modified the RSDP memory scan mechanism to support the extended checksum for ACPI 2.0 (and above) RSDPs. Note that the search continues until a valid RSDP signature is found with a valid checksum.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.5K Code, 11.5K Data, 90.0K Total

Debug Version: 165.2K Code, 68.6K Data, 233.8K Total

Current Release:

Non-Debug Version: 78.5K Code, 11.5K Data, 90.0K Total

Debug Version: 165.2K Code, 68.6K Data, 233.8K Total

2) iASL Compiler/Disassembler:

Fixed a missing semicolon in the aslcompiler.y file.

05 November 2004. Summary of changes for version 20041105:

1) ACPI CA Core Subsystem:

Implemented support for FADT revision 2. This was an interim table (between ACPI 1.0 and ACPI 2.0) that adds support for the FADT reset register.

Implemented optional support to allow uninitialized LocalX and ArgX variables in a control method. The variables are initialized to an Integer object with a value of zero. This support is enabled by setting the AcpiGbl_EnableInterpreterSlack flag to TRUE.

Implemented support for Integer objects for the SizeOf operator. Either 4 or 8 is returned, depending on the current integer size (32-bit or 64-bit, depending on the parent table revision).

Fixed a problem in the implementation of the SizeOf and ObjectType operators where the operand was resolved to a value too early, causing incorrect return values for some objects.

Fixed some possible memory leaks during exceptional conditions.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.0K Code, 11.5K Data, 89.5K Total

Debug Version: 164.8K Code, 68.6K Data, 233.4K Total

Current Release:

Non-Debug Version: 78.5K Code, 11.5K Data, 90.0K Total

Debug Version: 165.2K Code, 68.6K Data, 233.8K Total

2) iASL Compiler/Disassembler:

Implemented support for all ACPI 3.0 reserved names and methods.

Implemented all ACPI 3.0 grammar elements in the front-end, including support for semicolons.

Implemented the ACPI 3.0 Function() and ToUUID() macros

Fixed a problem in the disassembler where a Scope() operator would not be emitted properly if the target of the scope was in another table.

15 October 2004. Summary of changes for version 20041015:

Note: ACPI CA is currently undergoing an in-depth and complete formal evaluation to test/verify the following areas. Other suggestions are welcome. This will result in an increase in the frequency of releases and the number of bug fixes in the next few months.

- Functional tests for all ASL/AML operators
- All implicit/explicit type conversions
- Bit fields and operation regions
- 64-bit math support and 32-bit-only "truncated" math support
- Exceptional conditions, both compiler and interpreter
- Dynamic object deletion and memory leaks
- ACPI 3.0 support when implemented
- External interfaces to the ACPI subsystem

1) ACPI CA Core Subsystem:

Fixed two alignment issues on 64-bit platforms - within debug statements in AcpiEvGpeDetect and AcpiEvCreateGpeBlock. Removed references to the Address field within the non-aligned ACPI generic address structure.

Fixed a problem in the Increment and Decrement operators where incorrect operand resolution could result in the inadvertent modification of the original integer when the integer is passed into another method as an argument and the arg is then incremented/decremented.

Fixed a problem in the FromBCD operator where the upper 32-bits of a 64-bit BCD number were truncated during conversion.

Fixed a problem in the ToDecimal operator where the length of the resulting string could be set incorrectly too long if the input operand was a Buffer object.

Fixed a problem in the Logical operators (LLess, etc.) where a NULL byte (0) within a buffer would prematurely terminate a compare between buffer objects.

Added a check for string overflow (>200 characters as per the ACPI specification) during the Concatenate operator with two string operands.

Code and Data Size: Current and previous core subsystem library sizes are

shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.8K Code, 11.5K Data, 89.3K Total

Debug Version: 164.6K Code, 68.5K Data, 233.1K Total

Current Release:

Non-Debug Version: 78.0K Code, 11.5K Data, 89.5K Total

Debug Version: 164.8K Code, 68.6K Data, 233.4K Total

2) iASL Compiler/Disassembler:

Allow the use of the ObjectType operator on uninitialized Locals and Args (returns 0 as per the ACPI specification).

Fixed a problem where the compiler would fault if there was a syntax error in the FieldName of all of the various CreateXXXField operators.

Disallow the use of lower case letters within the EISAID macro, as per the ACPI specification. All EISAID strings must be of the form "UUUNNNN" Where U is an uppercase letter and N is a hex digit.

06 October 2004. Summary of changes for version 20041006:

1) ACPI CA Core Subsystem:

Implemented support for the ACPI 3.0 Timer operator. This ASL function implements a 64-bit timer with 100 nanosecond granularity.

Defined a new OSL interface, AcpiOsGetTimer. This interface is used to implement the ACPI 3.0 Timer operator. This allows the host OS to implement the timer with the best clock available. Also, it keeps the core subsystem out of the clock handling business, since the host OS (usually) performs this function.

Fixed an alignment issue on 64-bit platforms. The HwLowLevelRead(Write) functions use a 64-bit address which is part of the packed ACPI Generic Address Structure. Since the structure is non-aligned, the alignment macros are now used to extract the address to a local variable before use.

Fixed a problem where the ToInteger operator assumed all input strings were hexadecimal. The operator now handles both decimal strings and hex strings (prefixed with "0x").

Fixed a problem where the string length in the string object created as a result of the internal ConvertToString procedure could be incorrect. This potentially affected all implicit conversions and also the ToDecimalString and ToHexString operators.

Fixed two problems in the ToString operator. If the length parameter was zero, an incorrect string object was created and the value of the input length parameter was inadvertently changed from zero to Ones.

Fixed a problem where the optional ResourceSource string in the ExtendedIRQ resource macro was ignored.

Simplified the interfaces to the internal division functions, reducing code size and complexity.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.9K Code, 11.4K Data, 89.3K Total

Debug Version: 164.5K Code, 68.3K Data, 232.8K Total

Current Release:

Non-Debug Version: 77.8K Code, 11.5K Data, 89.3K Total

Debug Version: 164.6K Code, 68.5K Data, 233.1K Total

2) iASL Compiler/Disassembler:

Implemented support for the ACPI 3.0 Timer operator.

Fixed a problem where the Default() operator was inadvertently ignored in a Switch/Case block. This was a problem in the translation of the Switch statement to If...Else pairs.

Added support to allow a standalone Return operator, with no parentheses (or operands).

Fixed a problem with code generation for the ElseIf operator where the translated Else...If parse tree was improperly constructed leading to the

loss of some code.

22 September 2004. Summary of changes for version 20040922:

1) ACPI CA Core Subsystem:

Fixed a problem with the implementation of the LNot() operator where "Ones" was not returned for the TRUE case. Changed the code to return Ones instead of (!Arg) which was usually 1. This change affects iASL constant folding for this operator also.

Fixed a problem in AcpiUtInitializeBuffer where an existing buffer was not initialized properly -- Now zero the entire buffer in this case where the buffer already exists.

Changed the interface to AcpiOsSleep from (UINT32 Seconds, UINT32 Milliseconds) to simply (ACPI_INTEGER Milliseconds). This simplifies all related code considerably. This will require changes/updates to all OS interface layers (OSLs.)

Implemented a new external interface, AcpiInstallExceptionHandler, to allow a system exception handler to be installed. This handler is invoked upon any run-time exception that occurs during control method execution.

Added support for the DSDT in AcpiTbFindTable. This allows the DataTableRegion() operator to access the local copy of the DSDT.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.8K Code, 11.4K Data, 89.2K Total

Debug Version: 164.2K Code, 68.2K Data, 232.4K Total

Current Release:

Non-Debug Version: 77.9K Code, 11.4K Data, 89.3K Total

Debug Version: 164.5K Code, 68.3K Data, 232.8K Total

2) iASL Compiler/Disassembler:

Fixed a problem with constant folding and the LNot operator. LNot was returning 1 in the TRUE case, not Ones as per the ACPI specification. This

could result in the generation of an incorrect folded/reduced constant.

End-Of-File is now allowed within a "/*"-style comment. A parse error no longer occurs if such a comment is at the very end of the input ASL source file.

Implemented the "-r" option to override the Revision in the table header. The initial use of this option will be to simplify the evaluation of the AML interpreter by allowing a single ASL source module to be compiled for either 32-bit or 64-bit integers.

27 August 2004. Summary of changes for version 20040827:

1) ACPI CA Core Subsystem:

- Implemented support for implicit object conversion in the non-numeric logical operators (LEqual, LGreater, LGreaterEqual, LLess, LLessEqual, and LNotEqual.) Any combination of Integers/Strings/Buffers may now be used; the second operand is implicitly converted on the fly to match the type of the first operand. For example:

LEqual (Source1, Source2)

Source1 and Source2 must each evaluate to an integer, a string, or a buffer. The data type of Source1 dictates the required type of Source2. Source2 is implicitly converted if necessary to match the type of Source1.

- Updated and corrected the behavior of the string conversion support. The rules concerning conversion of buffers to strings (according to the ACPI specification) are as follows:

ToDecimalString - explicit byte-wise conversion of buffer to string of decimal values (0-255) separated by commas. ToHexString - explicit byte-wise conversion of buffer to string of hex values (0-FF) separated by commas. ToString - explicit byte-wise conversion of buffer to string. Byte-by-byte copy with no transform except NULL terminated. Any other implicit buffer-to-string conversion - byte-wise conversion of buffer to string of hex values (0-FF) separated by spaces.

- Fixed typo in definition of AcpiGbl_EnableInterpreterSlack.

- Fixed a problem in AcpiNsGetPathnameLength where the returned length was one byte too short in the case of a node in the root scope. This could cause a fault during debug output.

- Code and Data Size: Current and previous core subsystem library sizes are

shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.9K Code, 11.5K Data, 89.4K Total

Debug Version: 164.1K Code, 68.3K Data, 232.4K Total

Current Release:

Non-Debug Version: 77.8K Code, 11.4K Data, 89.2K Total

Debug Version: 164.2K Code, 68.2K Data, 232.4K Total

2) iASL Compiler/Disassembler:

- Fixed a Linux generation error.

16 August 2004. Summary of changes for version 20040816:

1) ACPI CA Core Subsystem:

Designed and implemented support within the AML interpreter for the so-called "implicit return". This support returns the result of the last ASL operation within a control method, in the absence of an explicit Return() operator. A few machines depend on this behavior, even though it is not explicitly supported by the ASL language. It is optional support that can be enabled at runtime via the AcpiGbl_EnableInterpreterSlack flag.

Removed support for the PCI_Config address space from the internal low level hardware interfaces (AcpiHwLowLevelRead and AcpiHwLowLevelWrite). This support was not used internally, and would not work correctly anyway because the PCI bus number and segment number were not supported. There are separate interfaces for PCI configuration space access because of the unique interface.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 78.0K Code, 11.5K Data, 89.5K Total
Debug Version: 164.1K Code, 68.2K Data, 232.3K Total
Current Release:
Non-Debug Version: 77.9K Code, 11.5K Data, 89.4K Total
Debug Version: 164.1K Code, 68.3K Data, 232.4K Total

2) iASL Compiler/Disassembler:

Fixed a problem where constants in ASL expressions at the root level (not within a control method) could be inadvertently truncated during code generation. This problem was introduced in the 20040715 release.

15 July 2004. Summary of changes for version 20040715:

1) ACPI CA Core Subsystem:

Restructured the internal HW GPE interfaces to pass/track the current state of interrupts (enabled/disabled) in order to avoid possible deadlock and increase flexibility of the interfaces.

Implemented a "lexicographical compare" for String and Buffer objects within the logical operators -- LGreater, LLess, LGreaterEqual, and LLessEqual -- as per further clarification to the ACPI specification. Behavior is similar to C library "strcmp".

Completed a major reduction in CPU stack use for the AcpiGetFirmwareTable external function. In the 32-bit non-debug case, the stack use has been reduced from 168 bytes to 32 bytes.

Deployed a new run-time configuration flag, AcpiGbl_EnableInterpreterSlack, whose purpose is to allow the AML interpreter to forgive certain bad AML constructs. Default setting is FALSE.

Implemented the first use of AcpiGbl_EnableInterpreterSlack in the Field IO support code. If enabled, it allows field access to go beyond the end of a region definition if the field is within the region length rounded up to the next access width boundary (a common coding error.)

Renamed OSD_HANDLER to ACPI_OSD_HANDLER, and OSD_EXECUTION_CALLBACK to ACPI_OSD_EXEC_CALLBACK for consistency with other ACPI symbols. Also, these symbols are lowercased by the latest version of the AcpiSrc tool.

The prototypes for the PCI interfaces in acpiosxf.h have been updated to rename "Register" to simply "Reg" to prevent certain compilers from complaining.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.8K Code, 11.5K Data, 89.3K Total

Debug Version: 163.8K Code, 68.2K Data, 232.0K Total

Current Release:

Non-Debug Version: 78.0K Code, 11.5K Data, 89.5K Total

Debug Version: 164.1K Code, 68.2K Data, 232.3K Total

2) iASL Compiler/Disassembler:

Implemented full support for Package objects within the Case() operator.

Note: The Break() operator is currently not supported within Case blocks (TermLists) as there is some question about backward compatibility with ACPI 1.0 interpreters.

Fixed a problem where complex terms were not supported properly within the Switch() operator.

Eliminated extraneous warning for compiler-emitted reserved names of the form "_T_x". (Used in Switch/Case operators.)

Eliminated optimization messages for "_T_x" objects and small constants within the DefinitionBlock operator.

15 June 2004. Summary of changes for version 20040615:

1) ACPI CA Core Subsystem:

Implemented support for Buffer and String objects (as per ACPI 2.0) for the following ASL operators: LEqual, LGreater, LLess, LGreaterEqual, and LLessEqual.

All directory names in the entire source package are lower case, as they were in earlier releases.

Implemented "Disassemble" command in the AML debugger that will disassemble

a single control method.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.7K Code, 11.5K Data, 89.2K Total

Debug Version: 163.3K Code, 67.2K Data, 230.5K Total

Current Release:

Non-Debug Version: 77.8K Code, 11.5K Data, 89.3K Total

Debug Version: 163.8K Code, 68.2K Data, 232.0K Total

2) iASL Compiler/Disassembler:

Implemented support for Buffer and String objects (as per ACPI 2.0) for the following ASL operators: LEqual, LGreater, LLess, LGreaterEqual, and LLessEqual.

All directory names in the entire source package are lower case, as they were in earlier releases.

Fixed a fault when using the -g or -d<nofilename> options if the FADT was not found.

Fixed an issue with the Windows version of the compiler where later versions of Windows place the FADT in the registry under the name "FADT" and not "FACP" as earlier versions did. This applies when using the -g or -d<nofilename> options. The compiler now looks for both strings as necessary.

Fixed a problem with compiler namepath optimization where a namepath within the Scope() operator could not be optimized if the namepath was a subpath of the current scope path.

27 May 2004. Summary of changes for version 20040527:

1) ACPI CA Core Subsystem:

Completed a new design and implementation for EBDA (Extended BIOS Data Area) support in the RSDP scan code. The original code improperly scanned for the

EBDA by simply scanning from memory location 0 to 0x400. The correct method is to first obtain the EBDA pointer from within the BIOS data area, then scan 1K of memory starting at the EBDA pointer. There appear to be few if any machines that place the RSDP in the EBDA, however.

Integrated a fix for a possible fault during evaluation of BufferField arguments. Obsolete code that was causing the problem was removed.

Found and fixed a problem in the Field Support Code where data could be corrupted on a bit field read that starts on an aligned boundary but does not end on an aligned boundary. Merged the read/write "datum length" calculation code into a common procedure.

Rolled in a couple of changes to the FreeBSD-specific header.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.6K Code, 11.5K Data, 89.1K Total

Debug Version: 163.2K Code, 67.2K Data, 230.4K Total

Current Release:

Non-Debug Version: 77.7K Code, 11.5K Data, 89.2K Total

Debug Version: 163.3K Code, 67.2K Data, 230.5K Total

2) iASL Compiler/Disassembler:

Fixed a generation warning produced by some overly-verbose compilers for a 64-bit constant.

14 May 2004. Summary of changes for version 20040514:

1) ACPI CA Core Subsystem:

Fixed a problem where hardware GPE enable bits sometimes not set properly during and after GPE method execution. Result of 04/27 changes.

Removed extra "clear all GPEs" when sleeping/waking.

Removed AcpiHwEnableGpe and AcpiHwDisableGpe, replaced by the single

AcpiHwWriteGpeEnableReg. Changed a couple of calls to the functions above to the new AcpiEv* calls as appropriate.

ACPI_OS_NAME was removed from the OS-specific headers. The default name is now "Microsoft Windows NT" for maximum compatibility. However this can be changed by modifying the acconfig.h file.

Allow a single invocation of AcpiInstallNotifyHandler for a handler that traps both types of notifies (System, Device). Use ACPI_ALL_NOTIFY flag.

Run _INI methods on ThermalZone objects. This is against the ACPI specification, but there is apparently ASL code in the field that has these _INI methods, and apparently "other" AML interpreters execute them.

Performed a full 16/32/64 bit lint that resulted in some small changes.

Added a sleep simulation command to the AML debugger to test sleep code.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.6K Code, 11.5K Data, 89.1K Total

Debug Version: 162.9K Code, 67.0K Data, 229.9K Total

Current Release:

Non-Debug Version: 77.6K Code, 11.5K Data, 89.1K Total

Debug Version: 163.2K Code, 67.2K Data, 230.4K Total

27 April 2004. Summary of changes for version 20040427:

1) ACPI CA Core Subsystem:

Completed a major overhaul of the GPE handling within ACPI CA. There are now three types of GPEs: wake-only, runtime-only, and combination wake/run. The only GPEs allowed to be combination wake/run are for button-style devices such as a control-method power button, control-method sleep button, or a notebook lid switch. GPEs that have an _Lxx or _Exx method and are not referenced by any _PRW methods are marked for "runtime" and hardware enabled. Any GPE that is referenced by a _PRW method is marked for "wake" (and disabled at runtime). However, at sleep time, only those GPEs that have been specifically enabled for wake via the AcpiEnableGpe interface will actually be hardware enabled.

A new external interface has been added, `AcpiSetGpeType()`, that is meant to be used by device drivers to force a GPE to a particular type. It will be especially useful for the drivers for the button devices mentioned above.

Completed restructuring of the ACPI CA initialization sequence so that default operation region handlers are installed before GPEs are initialized and the `_PRW` methods are executed. This will prevent errors when the `_PRW` methods attempt to access system memory or I/O space.

GPE enable/disable no longer reads the GPE enable register. We now keep the enable info for runtime and wake separate and in the `GPE_EVENT_INFO`. We thus no longer depend on the hardware to maintain these bits.

Always clear the wake status and fixed/GPE status bits before sleep, even for state S5.

Improved the AML debugger output for displaying the GPE blocks and their current status.

Added new strings for the `_OSI` method, of the form "Windows 2001 SPx" where $x = 0,1,2,3,4$.

Fixed a problem where the physical address was incorrectly calculated when the `Load()` operator was used to directly load from an Operation Region (vs. loading from a Field object.) Also added check for minimum table length for this case.

Fix for multiple mutex acquisition. Restore original thread `SyncLevel` on mutex release.

Added `ACPI_VALID_SXDS` flag to the `AcpiGetObjectInfo` interface for consistency with the other fields returned.

Shrunk the `ACPI_GPE_EVENT_INFO` structure by 40%. There is one such structure for each GPE in the system, so the size of this structure is important.

CPU stack requirement reduction: Cleaned up the method execution and object evaluation paths so that now a parameter structure is passed, instead of copying the various method parameters over and over again.

In `evregion.c`: Correctly exit and reenter the interpreter region if and only if dispatching an operation region request to a user-installed handler. Do not exit/reenter when dispatching to a default handler (e.g., default system memory or I/O handlers)

Notes for updating drivers for the new GPE support. The following changes must be made to ACPI-related device drivers that are attached to one or more GPEs: (This information will be added to the ACPI CA Programmer Reference.)

- 1) AcpiInstallGpeHandler no longer automatically enables the GPE, you must explicitly call AcpiEnableGpe.
- 2) There is a new interface called AcpiSetGpeType. This should be called before enabling the GPE. Also, this interface will automatically disable the GPE if it is currently enabled.
- 3) AcpiEnableGpe no longer supports a GPE type flag.

Specific drivers that must be changed:

1) EC driver:

```
AcpiInstallGpeHandler (NULL, GpeNum, ACPI_GPE_EDGE_TRIGGERED,  
AeGpeHandler, NULL);
```

```
AcpiSetGpeType (NULL, GpeNum, ACPI_GPE_TYPE_RUNTIME);
```

```
AcpiEnableGpe (NULL, GpeNum, ACPI_NOT_ISR);
```

2) Button Drivers (Power, Lid, Sleep):

Run _PRW method under parent device

If _PRW exists: /* This is a control-method button */

```
Extract GPE number and possibly GpeDevice
```

```
AcpiSetGpeType (GpeDevice, GpeNum, ACPI_GPE_TYPE_WAKE_RUN);
```

```
AcpiEnableGpe (GpeDevice, GpeNum, ACPI_NOT_ISR);
```

For all other devices that have _PRWs, we automatically set the GPE type to ACPI_GPE_TYPE_WAKE, but the GPE is NOT automatically (wake) enabled. This must be done on a selective basis, usually requiring some kind of user app to allow the user to pick the wake devices.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 77.0K Code, 11.4K Data, 88.4K Total

Debug Version: 161.0K Code, 66.3K Data, 227.3K Total

Current Release:

Non-Debug Version: 77.6K Code, 11.5K Data, 89.1K Total

Debug Version: 162.9K Code, 67.0K Data, 229.9K Total

02 April 2004. Summary of changes for version 20040402:

1) ACPI CA Core Subsystem:

Fixed an interpreter problem where an indirect store through an ArgX parameter was incorrectly applying the "implicit conversion rules" during the store. From the ACPI specification: "If the target is a method local or argument (LocalX or ArgX), no conversion is performed and the result is stored directly to the target". The new behavior is to disable implicit conversion during ALL stores to an ArgX.

Changed the behavior of the _PRW method scan to ignore any and all errors returned by a given _PRW. This prevents the scan from aborting from the failure of any single _PRW.

Moved the runtime configuration parameters from the global init procedure to static variables in acglobal.h. This will allow the host to override the default values easily.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.9K Code, 11.4K Data, 88.3K Total

Debug Version: 160.8K Code, 66.1K Data, 226.9K Total

Current Release:

Non-Debug Version: 77.0K Code, 11.4K Data, 88.4K Total

Debug Version: 161.0K Code, 66.3K Data, 227.3K Total

2) iASL Compiler/Disassembler:

iASL now fully disassembles SSDTs. However, External() statements are not generated automatically for unresolved symbols at this time. This is a planned feature for future implementation.

Fixed a scoping problem in the disassembler that occurs when the type of the target of a Scope() operator is overridden. This problem caused an incorrectly nested internal namespace to be constructed.

Any warnings or errors that are emitted during disassembly are now commented

out automatically so that the resulting file can be recompiled without any hand editing.

26 March 2004. Summary of changes for version 20040326:

1) ACPI CA Core Subsystem:

Implemented support for "wake" GPEs via interaction between GPEs and the _PRW methods. Every GPE that is pointed to by one or more _PRWs is identified as a WAKE GPE and by default will no longer be enabled at runtime. Previously, we were blindly enabling all GPEs with a corresponding _Lxx or _Exx method - but most of these turn out to be WAKE GPEs anyway. We believe this has been the cause of thousands of "spurious" GPEs on some systems.

This new GPE behavior is can be reverted to the original behavior (enable ALL GPEs at runtime) via a runtime flag.

Fixed a problem where aliased control methods could not access objects properly. The proper scope within the namespace was not initialized (transferred to the target of the aliased method) before executing the target method.

Fixed a potential race condition on internal object deletion on the return object in AcpiEvaluateObject.

Integrated a fix for resource descriptors where both _MEM and _MTP were being extracted instead of just _MEM. (i.e. bitmask was incorrectly too wide, 0x0F instead of 0x03.)

Added a special case for ACPI_ROOT_OBJECT in AcpiUtGetNodeName, preventing a fault in some cases.

Updated Notify() values for debug statements in evmisc.c

Return proper status from AcpiUtMutexInitialize, not just simply AE_OK.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 76.5K Code, 11.3K Data, 87.8K Total
Debug Version: 160.3K Code, 66.0K Data, 226.3K Total
Current Release:
Non-Debug Version: 76.9K Code, 11.4K Data, 88.3K Total
Debug Version: 160.8K Code, 66.1K Data, 226.9K Total

11 March 2004. Summary of changes for version 20040311:

1) ACPI CA Core Subsystem:

Fixed a problem where errors occurring during the parse phase of control method execution did not abort cleanly. For example, objects created and installed in the namespace were not deleted. This caused all subsequent invocations of the method to return the AE_ALREADY_EXISTS exception.

Implemented a mechanism to force a control method to "Serialized" execution if the method attempts to create namespace objects. (The root of the AE_ALREADY_EXISTS problem.)

Implemented support for the predefined _OSI "internal" control method. Initial supported strings are "Linux", "Windows 2000", "Windows 2001", and "Windows 2001.1", and can be easily upgraded for new strings as necessary. This feature will allow "other" operating systems to execute the fully tested, "Windows" code path through the ASL code

Global Lock Support: Now allows multiple acquires and releases with any internal thread. Removed concept of "owning thread" for this special mutex.

Fixed two functions that were inappropriately declaring large objects on the CPU stack: PsParseLoop, NsEvaluateRelative. Reduces the stack usage during method execution considerably.

Fixed a problem in the ACPI 2.0 FACS descriptor (actbl2.h) where the S4Bios_f field was incorrectly defined as UINT32 instead of UINT32_BIT.

Fixed a problem where AcpiEvGpeDetect would fault if there were no GPEs defined on the machine.

Implemented two runtime options: One to force all control method execution to "Serialized" to mimic Windows behavior, another to disable _OSI support if it causes problems on a given machine.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note

that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 74.8K Code, 10.1K Data, 84.9K Total

Debug Version: 158.7K Code, 65.1K Data, 223.8K Total

Current Release:

Non-Debug Version: 76.5K Code, 11.3K Data, 87.8K Total

Debug Version: 160.3K Code, 66.0K Data, 226.3K Total

2) iASL Compiler/Disassembler:

Fixed an array size problem for FreeBSD that would cause the compiler to fault.

20 February 2004. Summary of changes for version 20040220:

1) ACPI CA Core Subsystem:

Implemented execution of `_SxD` methods for Device objects in the `GetObjectInfo` interface.

Fixed calls to `_SST` method to pass the correct arguments.

Added a call to `_SST` on wake to restore to "working" state.

Check for End-Of-Buffer failure case in the `WalkResources` interface.

Integrated fix for 64-bit alignment issue in `acglobal.h` by moving two structures to the beginning of the file.

After wake, clear GPE status register(s) before enabling GPEs.

After wake, clear/enable power button. (Perhaps we should clear/enable all fixed events upon wake.)

Fixed a couple of possible memory leaks in the Namespace manager.

Integrated latest `acnetbsd.h` file.

11 February 2004. Summary of changes for version 20040211:

1) ACPI CA Core Subsystem:

Completed investigation and implementation of the call-by-reference mechanism for control method arguments.

Fixed a problem where a store of an object into an indexed package could fail if the store occurs within a different method than the method that created the package.

Fixed a problem where the ToDecimal operator could return incorrect results.

Fixed a problem where the CopyObject operator could fail on some of the more obscure objects (e.g., Reference objects.)

Improved the output of the Debug object to display buffer, package, and index objects.

Fixed a problem where constructs of the form "RefOf (ArgX)" did not return the expected result.

Added permanent ACPI_REPORT_ERROR macros for all instances of the ACPI_AML_INTERNAL exception.

Integrated latest version of acfreebsd.h

16 January 2004. Summary of changes for version 20040116:

The purpose of this release is primarily to update the copyright years in each module, thus causing a huge number of diffs. There are a few small functional changes, however.

1) ACPI CA Core Subsystem:

Improved error messages when there is a problem finding one or more of the required base ACPI tables

Reintroduced the definition of APIC_HEADER in actbl.h

Changed definition of MADT_ADDRESS_OVERRIDE to 64 bits (actbl.h)

Removed extraneous reference to NewObj in dsmthdat.c

2) iASL compiler

Fixed a problem introduced in December that disabled the correct disassembly of Resource Templates

03 December 2003. Summary of changes for version 20031203:

1) ACPI CA Core Subsystem:

Changed the initialization of Operation Regions during subsystem init to perform two entire walks of the ACPI namespace; The first to initialize the regions themselves, the second to execute the _REG methods. This fixed some interdependencies across _REG methods found on some machines.

Fixed a problem where a Store(Local0, Local1) could simply update the object reference count, and not create a new copy of the object if the Local1 is uninitialized.

Implemented support for the _SST reserved method during sleep transitions.

Implemented support to clear the SLP_TYP and SLP_EN bits when waking up, this is apparently required by some machines.

When sleeping, clear the wake status only if SleepState is not S5.

Fixed a problem in AcpiRsExtendedIrqResource() where an incorrect pointer arithmetic advanced a string pointer too far.

Fixed a problem in AcpiTbGetTablePtr() where a garbage pointer could be returned if the requested table has not been loaded.

Within the support for IRQ resources, restructured the handling of the active and edge/level bits.

Fixed a few problems in AcpiPsxExecute() where memory could be leaked under certain error conditions.

Improved error messages for the cases where the ACPI mode could not be entered.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (20031029):

Non-Debug Version: 74.4K Code, 10.1K Data, 84.5K Total

Debug Version: 158.3K Code, 65.0K Data, 223.3K Total
Current Release:
Non-Debug Version: 74.8K Code, 10.1K Data, 84.9K Total
Debug Version: 158.7K Code, 65.1K Data, 223.8K Total

2) iASL Compiler/Disassembler:

Implemented a fix for the iASL disassembler where a bad index was generated. This was most noticeable on 64-bit platforms

29 October 2003. Summary of changes for version 20031029:

1) ACPI CA Core Subsystem:

Fixed a problem where a level-triggered GPE with an associated `_Lxx` control method was incorrectly cleared twice.

Fixed a problem with the Field support code where an access can occur beyond the end-of-region if the field is non-aligned but extends to the very end of the parent region (resulted in an `AE_AML_REGION_LIMIT` exception.)

Fixed a problem with ACPI Fixed Events where an RT Clock handler would not get invoked on an RTC event. The RTC event bitmasks for the PM1 registers were not being initialized properly.

Implemented support for executing `_STA` and `_INI` methods for Processor objects. Although this is currently not part of the ACPI specification, there is existing ASL code that depends on the init-time execution of these methods.

Implemented and deployed a `GetDescriptorName` function to decode the various types of internal descriptors. Guards against null descriptors during debug output also.

Implemented and deployed a `GetNodeName` function to extract the 4-character namespace node name. This function simplifies the debug and error output, as well as guarding against null pointers during output.

Implemented and deployed the `ACPI_FORMAT_UINT64` helper macro to simplify the debug and error output of 64-bit integers. This macro replaces the `HIDWORD` and `LODWORD` macros for dumping these integers.

Updated the implementation of the Stall() operator to only call AcpiOsStall(), and also return an error if the operand is larger than 255. This preserves the required behavior of not relinquishing the processor, as would happen if AcpiOsSleep() was called for "long stalls".

Constructs of the form "Store(LocalX,LocalX)" where LocalX is not initialized are now treated as NOOPs.

Cleaned up a handful of warnings during 64-bit generation.

Fixed a reported error where and incorrect GPE number was passed to the GPE dispatch handler. This value is only used for error output, however. Used this opportunity to clean up and streamline the GPE dispatch code.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The

debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (20031002):

Non-Debug Version: 74.1K Code, 9.7K Data, 83.8K Total

Debug Version: 157.9K Code, 64.8K Data, 222.7K Total

Current Release:

Non-Debug Version: 74.4K Code, 10.1K Data, 84.5K Total

Debug Version: 158.3K Code, 65.0K Data, 223.3K Total

2) iASL Compiler/Disassembler:

Updated the iASL compiler to return an error if the operand to the Stall() operator is larger than 255.

02 October 2003. Summary of changes for version 20031002:

1) ACPI CA Core Subsystem:

Fixed a problem with Index Fields where the index was not incremented for fields that require multiple writes to the

index/data registers (Fields that are wider than the data register.)

Fixed a problem with all Field objects where a write could go beyond the end-of-field if the field was larger than the access granularity and therefore required multiple writes to complete the request. An extra write beyond the end of the field could happen inadvertently.

Fixed a problem with Index Fields where a BUFFER_OVERFLOW error would incorrectly be returned if the width of the Data Register was larger than the specified field access width.

Completed fixes for LoadTable() and Unload() and verified their operation. Implemented full support for the "DdbHandle" object throughout the ACPI CA subsystem.

Implemented full support for the MADT and ECDT tables in the ACPI CA header files. Even though these tables are not directly consumed by ACPI CA, the header definitions are useful for ACPI device drivers.

Integrated resource descriptor fixes posted to the Linux ACPI list. This included checks for minimum descriptor length, and support for trailing NULL strings within descriptors that have optional string elements.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (20030918):

Non-Debug Version: 73.9K Code, 9.7K Data, 83.6K Total

Debug Version: 157.3K Code, 64.5K Data, 221.8K Total

Current Release:

Non-Debug Version: 74.1K Code, 9.7K Data, 83.8K Total

Debug Version: 157.9K Code, 64.8K Data, 222.7K Total

2) iASL Compiler:

Implemented detection of non-ASCII characters within the input source ASL file. This catches attempts to compile binary (AML)

files early in the compile, with an informative error message.

Fixed a problem where the disassembler would fault if the output filename could not be generated or if the output file could not be opened.

18 September 2003. Summary of changes for version 20030918:

1) ACPI CA Core Subsystem:

Found and fixed a longstanding problem with the late execution of the various deferred AML opcodes (such as Operation Regions, Buffer Fields, Buffers, and Packages). If the name string specified for the name of the new object placed the object in a scope other than the current scope, the initialization/execution of the opcode failed. The solution to this problem was to implement a mechanism where the late execution of such opcodes does not attempt to lookup/create the name a second time in an incorrect scope. This fixes the "region size computed incorrectly" problem.

Fixed a call to AcpiHwRegisterWrite in hwregs.c that was causing a Global Lock AE_BAD_PARAMETER error.

Fixed several 64-bit issues with prototypes, casting and data types.

Removed duplicate prototype from acdisasm.h

Fixed an issue involving EC Operation Region Detach (Shaohua Li)

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release:

Non-Debug Version: 73.7K Code, 9.7K Data, 83.4K Total

Debug Version: 156.9K Code, 64.2K Data, 221.1K Total

Current Release:

Non-Debug Version: 73.9K Code, 9.7K Data, 83.6K Total

Debug Version: 157.3K Code, 64.5K Data, 221.8K Total

2) Linux:

Fixed the AcpiOsSleep implementation in osunixxf.c to pass the correct sleep time in seconds.

14 July 2003. Summary of changes for version 20030619:

1) ACPI CA Core Subsystem:

Parse SSDTs in order discovered, as opposed to reverse order
(Hrvoje Habjanic)

Fixes from FreeBSD and NetBSD. (Frank van der Linden, Thomas
Klausner,
Nate Lawson)

2) Linux:

Dynamically allocate SDT list (suggested by Andi Kleen)

proc function return value cleanups (Andi Kleen)

Correctly handle NMI watchdog during long stalls (Andrew Morton)

Make it so acpismf=force works (reported by Andrew Morton)

19 June 2003. Summary of changes for version 20030619:

1) ACPI CA Core Subsystem:

Fix To/FromBCD, eliminating the need for an arch-specific #define.

Do not acquire a semaphore in the S5 shutdown path.

Fix ex_digits_needed for 0. (Takayoshi Kochi)

Fix sleep/stall code reversal. (Andi Kleen)

Revert a change having to do with control method calling semantics.

2) Linux:

acpiphp update (Takayoshi Kochi)

Export acpi_disabled for sonypi (Stelian Pop)

Mention acpism=force in config help

Re-add acpitab.c and acpism=force. This improves backwards

compatibility and also cleans up the code to a significant degree.

Add ASUS Value-add driver (Karol Kozimor and Julien Lerouge)

22 May 2003. Summary of changes for version 20030522:

1) ACPI CA Core Subsystem:

Found and fixed a reported problem where an AE_NOT_FOUND error occurred occasionally during _BST evaluation. This turned out to be an Owner ID allocation issue where a called method did not get a new ID assigned to it. Eventually, (after 64k calls), the Owner ID UINT16 would wraparound so that the ID would be the same as the caller's and the called method would delete the caller's namespace.

Implemented extended error reporting for control methods that are aborted due to a run-time exception. Output includes the exact AML instruction that caused the method abort, a dump of the method locals and arguments at the time of the abort, and a trace of all nested control method calls.

Modified the interpreter to allow the creation of buffers of zero length from the AML code. Implemented new code to ensure that no attempt is made to actually allocate a memory buffer (of length zero) - instead, a simple buffer object with a NULL buffer pointer and length zero is created. A warning is no longer issued when the AML attempts to create a zero-length buffer.

Implemented a workaround for the "leading asterisk issue" in _HIDs, _UIDs, and _CIDs in the AML interpreter. One leading asterisk is automatically removed if present in any HID, UID, or CID strings. The iASL compiler will still flag this asterisk as an error, however.

Implemented full support for _CID methods that return a package of multiple CIDs (Compatible IDs). The AcpiGetObjectInfo() interface

now additionally returns a device _CID list if present. This required a change to the external interface in order to pass an ACPI_BUFFER object as a parameter since the _CID list is of variable length.

Fixed a problem with the new AE_SAME_HANDLER exception where handler initialization code did not know about this exception.

Code and Data Size: Current and previous core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (20030509):

Non-Debug Version: 73.4K Code, 9.7K Data, 83.1K Total

Debug Version: 156.1K Code, 63.9K Data, 220.0K Total

Current Release:

Non-Debug Version: 73.7K Code, 9.7K Data, 83.4K Total

Debug Version: 156.9K Code, 64.2K Data, 221.1K Total

2) Linux:

Fixed a bug in which we would reinitialize the ACPI interrupt after it was already working, thus disabling all ACPI and the IRQs for any other device sharing the interrupt. (Thanks to Stian Jordet)

Toshiba driver update (John Belmonte)

Return only 0 or 1 for our interrupt handler status (Andrew Morton)

3) iASL Compiler:

Fixed a reported problem where multiple (nested) ElseIf() statements were not handled correctly by the compiler, resulting in incorrect warnings and incorrect AML code. This was a problem in both the ASL parser and the code generator.

4) Documentation:

Added changes to existing interfaces, new exception codes, and new text concerning reference count object management versus garbage collection.

09 May 2003. Summary of changes for version 20030509.

1) ACPI CA Core Subsystem:

Changed the subsystem initialization sequence to hold off installation of address space handlers until the hardware has been initialized and the system has entered ACPI mode. This is because the installation of space handlers can cause `_REG` methods to be run. Previously, the `_REG` methods could potentially be run before ACPI mode was enabled.

Fixed some memory leak issues related to address space handler and notify handler installation. There were some problems with the reference count mechanism caused by the fact that the handler objects are shared across several namespace objects.

Fixed a reported problem where reference counts within the namespace were not properly updated when named objects created by method execution were deleted.

Fixed a reported problem where multiple SSDTs caused a deletion issue during subsystem termination. Restructured the table data structures to simplify the linked lists and the related code.

Fixed a problem where the table ID associated with secondary tables (SSDTs) was not being propagated into the namespace objects created by those tables. This would only present a problem for tables that are unloaded at run-time, however.

Updated `AcpiOsReadable` and `AcpiOsWritable` to use the `ACPI_SIZE` type as the length parameter (instead of `UINT32`).

Solved a long-standing problem where an `ALREADY_EXISTS` error appears on various systems. This problem could happen when there are multiple `PCI_Config` operation regions under a single PCI root bus. This doesn't happen very frequently, but there are some systems that do this in the ASL.

Fixed a reported problem where the internal `DeleteNode` function was incorrectly handling the case where a namespace node was the first in the parent's child list, and had additional peers (not the only child, but first in the list of children.)

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 73.7K Code, 9.5K Data, 83.2K Total

Debug Version: 156.1K Code, 63.6K Data, 219.7K Total

Current Release:

Non-Debug Version: 73.4K Code, 9.7K Data, 83.1K Total

Debug Version: 156.1K Code, 63.9K Data, 220.0K Total

2) Linux:

Allow ":" in OS override string (Ducrot Bruno)

Kobject fix (Greg KH)

3 iASL Compiler/Disassembler:

Fixed a problem in the generation of the C source code files (AML is emitted in C source statements for BIOS inclusion) where the Ascii dump that appears within a C comment at the end of each line could cause a compile time error if the AML sequence happens to have an open comment or close comment sequence embedded.

24 April 2003. Summary of changes for version 20030424.

1) ACPI CA Core Subsystem:

Support for big-endian systems has been implemented. Most of the support has been invisibly added behind big-endian versions of the `ACPI_MOVE_*` macros.

Fixed a problem in `AcpiHwDisableGpeBlock()` and `AcpiHwClearGpeBlock()` where an incorrect offset was passed to the low level hardware write routine. The offset parameter was actually eliminated from the low level read/write routines because

they had become obsolete.

Fixed a problem where a handler object was deleted twice during the removal of a fixed event handler.

2) Linux:

A fix for SMP systems with link devices was contributed by

Compaq's Dan Zink.

(2.5) Return whether we handled the interrupt in our IRQ handler. (Linux ISRs no longer return void, so we can propagate the handler return value from the ACPI CA core back to the OS.)

3) Documentation:

The ACPI CA Programmer Reference has been updated to reflect new interfaces and changes to existing interfaces.

28 March 2003. Summary of changes for version 20030328.

1) ACPI CA Core Subsystem:

The GPE Block Device support has been completed. New interfaces are AcpiInstallGpeBlock and AcpiRemoveGpeBlock. The Event interfaces (enable, disable, clear, getstatus) have been split into separate interfaces for Fixed Events and General Purpose Events (GPEs) in order to support GPE Block Devices properly.

Fixed a problem where the error message "Failed to acquire semaphore" would appear during operations on the embedded controller (EC).

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 72.3K Code, 9.5K Data, 81.8K Total
Debug Version: 154.0K Code, 63.4K Data, 217.4K Total
Current Release:
Non-Debug Version: 73.7K Code, 9.5K Data, 83.2K Total
Debug Version: 156.1K Code, 63.6K Data, 219.7K Total

28 February 2003. Summary of changes for version 20030228.

1) ACPI CA Core Subsystem:

The GPE handling and dispatch code has been completely overhauled in preparation for support of GPE Block Devices (ID ACPI0006). This affects internal data structures and code only; there should be no differences visible externally. One new file has been added, evgpeblk.c

The FADT fields GPE0_BLK_LEN and GPE1_BLK_LEN are now the only fields that are used to determine the GPE block lengths. The REGISTER_BIT_WIDTH field of the X_GPEX_BLK extended address structures are ignored. This is per the ACPI specification but it isn't very clear. The full 256 Block 0/1 GPEs are now supported (the use of REGISTER_BIT_WIDTH limited the number of GPEs to 128).

In the SCI interrupt handler, removed the read of the PM1_CONTROL register to look at the SCI_EN bit. On some machines, this read causes an SMI event and greatly slows down SCI events. (This may in fact be the cause of slow battery status response on some systems.)

Fixed a problem where a store of a NULL string to a package object could cause the premature deletion of the object. This was seen during execution of the battery _BIF method on some systems, resulting in no battery data being returned.

Added AcpiWalkResources interface to simplify parsing of resource lists.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 72.0K Code, 9.5K Data, 81.5K Total

Debug Version: 153.0K Code, 62.9K Data, 215.9K Total

Current Release:

Non-Debug Version: 72.3K Code, 9.5K Data, 81.8K Total

Debug Version: 154.0K Code, 63.4K Data, 217.4K Total

2) Linux

S3 fixes (Ole Rohne)

Update ACPI PHP driver with to use new acpi_walk_resource API
(Bjorn Helgaas)

Add S4BIOS support (Pavel Machek)

Map in entire table before performing checksum (John Stultz)

Expand the mem= cmdline to allow the specification of reserved and
ACPI DATA blocks (Pavel Machek)

Never use ACPI on VISWS

Fix derive_pci_id (Ducrot Bruno, Alvaro Lopez)

Revert a change that allowed P_BLK lengths to be 4 or 5. This is
causing us to think that some systems support C2 when they really
don't.

Do not count processor objects for non-present CPUs (Thanks to
Dominik Brodowski)

3) iASL Compiler:

Fixed a problem where ASL include files could not be found and
opened.

Added support for the _PDC reserved name.

22 January 2003. Summary of changes for version 20030122.

1) ACPI CA Core Subsystem:

Added a check for constructs of the form: Store (Local0, Local0) where Local0 is not initialized. Apparently, some BIOS programmers believe that this is a NOOP. Since this store doesn't do anything anyway, the new prototype behavior will ignore this error. This is a case where we can relax the strict checking in the interpreter in the name of compatibility.

2) Linux

The AcpiSrc Source Conversion Utility has been released with the Linux package for the first time. This is the utility that is used to convert the ACPI CA base source code to the Linux version.

(Both) Handle P_BLK lengths shorter than 6 more gracefully

(Both) Move more headers to include/acpi, and delete an unused header.

(Both) Move drivers/acpi/include directory to include/acpi

(Both) Boot functions don't use cmdline, so don't pass it around

(Both) Remove include of unused header (Adrian Bunk)

(Both) acpiphp.h includes both linux/acpi.h and acpi_bus.h. Since the former now also includes the latter, acpiphp.h only needs the one, now.

(2.5) Make it possible to select method of bios restoring after S3 resume. [=> no more ugly ifdefs] (Pavel Machek)

(2.5) Make proc write interfaces work (Pavel Machek)

(2.5) Properly init/clean up in cpufreq/acpi (Dominik Brodowski)

(2.5) Break out ACPI Perf code into its own module, under cpufreq (Dominik Brodowski)

(2.4) S4BIOS support (Ducrot Bruno)

(2.4) Fix acpiphp_glue.c for latest ACPI struct changes (Sergio Visinoni)

3) iASL Compiler:

Added support to disassemble SSDT and PSDTs.

Implemented support to obtain SSDTs from the Windows registry if available.

09 January 2003. Summary of changes for version 20030109.

1) ACPI CA Core Subsystem:

Changed the behavior of the internal Buffer-to-String conversion function. The current ACPI specification states that the contents of the buffer are "converted to a string of two-character hexadecimal numbers, each separated by a space". Unfortunately, this definition is not backwards compatible with existing ACPI 1.0 implementations (although the behavior was not defined in the ACPI 1.0 specification). The new behavior simply copies data from the buffer to the string until a null character is found or the end of the buffer is reached. The new String object is always null terminated. This problem was seen during the generation of _BIF battery data where incorrect strings were returned for battery type, etc. This will also require an errata to the ACPI specification.

Renamed all instances of NATIVE_UINT and NATIVE_INT to ACPI_NATIVE_UINT and ACPI_NATIVE_INT, respectively.

Copyright in all module headers (both Linux and non-Linux) has been updated to 2003.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 72.0K Code, 9.5K Data, 81.5K Total

Debug Version: 153.0K Code, 62.9K Data, 215.9K Total

Current Release:

Non-Debug Version: 72.0K Code, 9.5K Data, 81.5K Total

Debug Version: 153.0K Code, 62.9K Data, 215.9K Total

2) Linux

Fixed an oops on module insertion/removal (Matthew Tippet)

(2.4) Fix to handle dynamic size of mp_irqs (Joerg Prante)

(2.5) Replace pr_debug (Randy Dunlap)

(2.5) Remove usage of CPUFREQ_ALL_CPUS (Dominik Brodowski)

(Both) Eliminate spawning of thread from timer callback, in favor of schedule_work()

(Both) Show Lid status in /proc (Zdenek OGAR Skalak)

(Both) Added define for Fixed Function HW region (Matthew Wilcox)

(Both) Add missing statics to button.c (Pavel Machek)

Several changes have been made to the source code translation utility that generates the Linux Code in order to make the code more "Linux-like":

All typedefs on structs and unions have been removed in keeping with the Linux coding style.

Removed the non-Linux SourceSafe module revision number from each module header.

Completed major overhaul of symbols to be lowercased for linux. Doubled the number of symbols that are lowercased.

Fixed a problem where identifiers within procedure headers and within quotes were not fully lower cased (they were left with a starting capital.)

Some C macros whose only purpose is to allow the generation of 16-bit code are now completely removed in the Linux code, increasing readability and maintainability.

12 December 2002. Summary of changes for version 20021212.

1) ACPI CA Core Subsystem:

Fixed a problem where the creation of a zero-length AML Buffer would cause a fault.

Fixed a problem where a Buffer object that pointed to a static AML buffer (in an ACPI table) could inadvertently be deleted, causing memory corruption.

Fixed a problem where a user buffer (passed in to the external ACPI CA interfaces) could be overwritten if the buffer was too small to complete the operation, causing memory corruption.

Fixed a problem in the Buffer-to-String conversion code where a string of length one was always returned, regardless of the size of the input Buffer object.

Removed the NATIVE_CHAR data type across the entire source due to lack of need and lack of consistent use.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 72.1K Code, 9.5K Data, 81.6K Total

Debug Version: 152.7K Code, 62.7K Data, 215.4K Total

Current Release:

Non-Debug Version: 72.0K Code, 9.5K Data, 81.5K Total

Debug Version: 153.0K Code, 62.9K Data, 215.9K Total

05 December 2002. Summary of changes for version 20021205.

1) ACPI CA Core Subsystem:

Fixed a problem where a store to a String or Buffer object could cause corruption of the DSDT if the object type being stored was the same as the target object type and the length of the object being stored was equal to or smaller than the original (existing) target object. This was seen to cause corruption of battery _BIF buffers if the _BIF method modified the buffer on the fly.

Fixed a problem where an internal error was generated if a control

method invocation was used in an OperationRegion, Buffer, or Package declaration. This was caused by the deferred parsing of the control method and thus the deferred creation of the internal method object. The solution to this problem was to create the internal method object at the moment the method is encountered in the first pass - so that subsequent references to the method will be able to obtain the required parameter count and thus properly parse the method invocation. This problem presented itself as an AE_AML_INTERNAL during the pass 1 parse phase during table load.

Fixed a problem where the internal String object copy routine did not always allocate sufficient memory for the target String object and caused memory corruption. This problem was seen to cause "Allocation already present in list!" errors as memory allocation became corrupted.

Implemented a new function for the evaluation of namespace objects that allows the specification of the allowable return object types. This simplifies a lot of code that checks for a return object of one or more specific objects returned from the evaluation (such as _STA, etc.) This may become an external function if it would be useful to ACPI-related drivers.

Completed another round of prefixing #defines with "ACPI_" for clarity.

Completed additional code restructuring to allow more modular linking for iASL compiler and AcpiExec. Several files were split creating new files. New files: nsparse.c dsinit.c evgpe.c

Implemented an abort mechanism to terminate an executing control method via the AML debugger. This feature is useful for debugging control methods that depend (wait) for specific hardware responses.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 71.4K Code, 9.0K Data, 80.4K Total

Debug Version: 152.9K Code, 63.3K Data, 216.2K Total

Current Release:

Non-Debug Version: 72.1K Code, 9.5K Data, 81.6K Total

Debug Version: 152.7K Code, 62.7K Data, 215.4K Total

2) iASL Compiler/Disassembler

Fixed a compiler code generation problem for "Interrupt" Resource Descriptors. If specified in the ASL, the optional "Resource Source Index" and "Resource Source" fields were not inserted into the correct location within the AML resource descriptor, creating an invalid descriptor.

Fixed a disassembler problem for "Interrupt" resource descriptors. The optional "Resource Source Index" and "Resource Source" fields were ignored.

22 November 2002. Summary of changes for version 20021122.

1) ACPI CA Core Subsystem:

Fixed a reported problem where an object stored to a Method Local or Arg was not copied to a new object during the store - the object pointer was simply copied to the Local/Arg. This caused all subsequent operations on the Local/Arg to also affect the original source of the store operation.

Fixed a problem where a store operation to a Method Local or Arg was not completed properly if the Local/Arg contained a reference (from RefOf) to a named field. The general-purpose store-to-namespace-node code is now used so that this case is handled automatically.

Fixed a problem where the internal object copy routine would cause a protection fault if the object being copied was a Package and contained either 1) a NULL package element or 2) a nested sub-package.

Fixed a problem with the GPE initialization that resulted from an ambiguity in the ACPI specification. One section of the specification states that both the address and length of the GPE block must be zero if the block is not supported. Another section implies that only the address need be zero if the block is not supported. The code has been changed so that both the address and the length must be non-zero to indicate a valid GPE block (i.e., if either the address or the length is zero, the GPE block is

invalid.)

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 71.3K Code, 9.0K Data, 80.3K Total

Debug Version: 152.7K Code, 63.2K Data, 215.5K Total

Current Release:

Non-Debug Version: 71.4K Code, 9.0K Data, 80.4K Total

Debug Version: 152.9K Code, 63.3K Data, 216.2K Total

2) Linux

Cleaned up EC driver. Exported an external EC read/write interface. By going through this, other drivers (most notably `sonypi`) will be able to serialize access to the EC.

3) iASL Compiler/Disassembler

Implemented support to optionally generate include files for both ASM and C (the `-i` switch). This simplifies BIOS development by automatically creating include files that contain external declarations for the symbols that are created within the

(optionally generated) ASM and C AML source files.

15 November 2002. Summary of changes for version 20021115.

1) ACPI CA Core Subsystem:

Fixed a memory leak problem where an error during resolution of method arguments during a method invocation from another method failed to cleanup properly by deleting all successfully resolved argument objects.

Fixed a problem where the target of the `Index()` operator was not

correctly constructed if the source object was a package. This problem has not been detected because the use of a target operand with Index() is very rare.

Fixed a problem with the Index() operator where an attempt was made to delete the operand objects twice.

Fixed a problem where an attempt was made to delete an operand twice during execution of the CondRefOf() operator if the target did not exist.

Implemented the first of perhaps several internal create object functions that create and initialize a specific object type. This consolidates duplicated code wherever the object is created, thus shrinking the size of the subsystem.

Implemented improved debug/error messages for errors that occur during nested method invocations. All executing method pathnames are displayed (with the error) as the call stack is unwound - thus simplifying debug.

Fixed a problem introduced in the 10/02 release that caused premature deletion of a buffer object if a buffer was used as an ASL operand where an integer operand is required (Thus causing an implicit object conversion from Buffer to Integer.) The change in the 10/02 release was attempting to fix a memory leak (albeit incorrectly.)

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 71.9K Code, 9.1K Data, 81.0K Total

Debug Version: 153.1K Code, 63.3K Data, 216.4K Total

Current Release:

Non-Debug Version: 71.3K Code, 9.0K Data, 80.3K Total

Debug Version: 152.7K Code, 63.2K Data, 215.5K Total

2) Linux

Changed the implementation of the ACPI semaphores to use down()

instead of `down_interruptable()`. It is important that the execution of ACPI control methods not be interrupted by signals. Methods must run to completion, or the system may be left in an unknown/unstable state.

Fixed a compilation error when `CONFIG_SOFTWARE_SUSPEND` is not set.
(Shawn Starr)

3) iASL Compiler/Disassembler

Changed the default location of output files. All output files are now placed in the current directory by default instead of in the directory of the source file. This change may affect some existing makefiles, but it brings the behavior of the compiler in line with other similar tools. The location of the output files can be overridden with the `-p` command line switch.

11 November 2002. Summary of changes for version 20021111.

0) ACPI Specification 2.0B is released and is now available at:
<http://www.acpi.info/index.html>

1) ACPI CA Core Subsystem:

Implemented support for the ACPI 2.0 SMBus Operation Regions. This includes the early detection and handoff of the request to the SMBus region handler (avoiding all of the complex field support code), and support for the bidirectional return packet from an SMBus write operation. This paves the way for the development of SMBus drivers in each host operating system.

Fixed a problem where the semaphore `WAIT_FOREVER` constant was defined as 32 bits, but must be 16 bits according to the ACPI specification. This had the side effect of causing ASL Mutex/Event timeouts even though the ASL code requested a wait forever. Changed all internal references to the ACPI timeout parameter to 16 bits to prevent future problems. Changed the name of `WAIT_FOREVER` to `ACPI_WAIT_FOREVER`.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these

values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 71.4K Code, 9.0K Data, 80.4K Total

Debug Version: 152.3K Code, 63.0K Data, 215.3K Total

Current Release:

Non-Debug Version: 71.9K Code, 9.1K Data, 81.0K Total

Debug Version: 153.1K Code, 63.3K Data, 216.4K Total

2) Linux

Module loading/unloading fixes (John Cagle)

3) iASL Compiler/Disassembler

Added support for the SMBBlockProcessCall keyword (ACPI 2.0)

Implemented support for the disassembly of all SMBus protocol keywords (SMBQuick, SMBWord, etc.)

01 November 2002. Summary of changes for version 20021101.

1) ACPI CA Core Subsystem:

Fixed a problem where platforms that have a GPE1 block but no GPE0 block were not handled correctly. This resulted in a "GPE overlap" error message. GPE0 is no longer required.

Removed code added in the previous release that inserted nodes into the namespace in alphabetical order. This caused some side-effects on various machines. The root cause of the problem is still under investigation since in theory, the internal ordering of the namespace nodes should not matter.

Enhanced error reporting for the case where a named object is not found during control method execution. The full ACPI namepath (name reference) of the object that was not found is displayed in this case.

Note: as a result of the overhaul of the namespace object types in the previous release, the namespace nodes for the predefined scopes (`_TZ`, `_PR`, etc.) are now of the type `ACPI_TYPE_LOCAL_SCOPE` instead of `ACPI_TYPE_ANY`. This simplifies the namespace management code but may affect code that walks the namespace tree looking for specific object types.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 70.7K Code, 8.6K Data, 79.3K Total

Debug Version: 151.7K Code, 62.4K Data, 214.1K Total

Current Release:

Non-Debug Version: 71.4K Code, 9.0K Data, 80.4K Total

Debug Version: 152.3K Code, 63.0K Data, 215.3K Total

2) Linux

Fixed a problem introduced in the previous release where the Processor and Thermal objects were not recognized and installed in `/proc`. This was related to the scope type change described above.

3) iASL Compiler/Disassembler

Implemented the `-g` option to get all of the required ACPI tables from the registry and save them to files (Windows version of the compiler only.) The required tables are the FADT, FACS, and DSDT.

Added ACPI table checksum validation during table disassembly in order to catch corrupted tables.

22 October 2002. Summary of changes for version 20021022.

1) ACPI CA Core Subsystem:

Implemented a restriction on the Scope operator that the target must already exist in the namespace at the time the operator is

encountered (during table load or method execution). In other words, forward references are not allowed and Scope() cannot create a new object. This changes the previous behavior where the interpreter would create the name if not found. This new behavior correctly enables the search-to-root algorithm during namespace lookup of the target name. Because of this upsearch, this fixes the known Compaq _SB_.OKEC problem and makes both the AML interpreter and iASL compiler compatible with other ACPI implementations.

Completed a major overhaul of the internal ACPI object types for the ACPI Namespace and the associated operand objects. Many of these types had become obsolete with the introduction of the two-pass namespace load. This cleanup simplifies the code and makes the entire namespace load mechanism much clearer and easier to understand.

Improved debug output for tracking scope opening/closing to help diagnose scoping issues. The old scope name as well as the new scope name are displayed. Also improved error messages for problems with ASL Mutex objects and error messages for GPE problems.

Cleaned up the namespace dump code, removed obsolete code.

All string output (for all namespace/object dumps) now uses the common ACPI string output procedure which handles escapes properly and does not emit non-printable characters.

Fixed some issues with constants in the 64-bit version of the local C library (utclib.c)

2) Linux

EC Driver: No longer attempts to acquire the Global Lock at interrupt level.

3) iASL Compiler/Disassembler

Implemented ACPI 2.0B grammar change that disallows all Type 1 and 2 opcodes outside of a control method. This means that the "executable" operators (versus the "namespace" operators) cannot be used at the table level; they can only be used within a control method.

Implemented the restriction on the Scope() operator where the

target must already exist in the namespace at the time the operator is encountered (during ASL compilation). In other words, forward references are not allowed and Scope() cannot create a new object. This makes the iASL compiler compatible with other ACPI implementations and makes the Scope() implementation adhere to the ACPI specification.

Fixed a problem where namepath optimization for the Alias operator was optimizing the wrong path (of the two namepaths.) This caused a "Missing alias link" error message.

Fixed a problem where an "unknown reserved name" warning could be incorrectly generated for names like "_SB" when the trailing underscore is not used in the original ASL.

Fixed a problem where the reserved name check did not handle NamePaths with multiple NameSegs correctly. The first nameseg of the NamePath was examined instead of the last NameSeg.

02 October 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem version 20021002:

Fixed a problem where a store/copy of a string to an existing string did not always set the string length properly in the String object.

Fixed a reported problem with the ToString operator where the behavior was identical to the ToHexString operator instead of just simply converting a raw buffer to a string data type.

Fixed a problem where CopyObject and the other "explicit" conversion operators were not updating the internal namespace node type as part of the store operation.

Fixed a memory leak during implicit source operand conversion where the original object was not deleted if it was converted to a new object of a different type.

Enhanced error messages for all problems associated with namespace lookups. Common procedure generates and prints the lookup name as well as the formatted status.

Completed implementation of a new design for the Alias support

within the namespace. The existing design did not handle the case where a new object was assigned to one of the two names due to the use of an explicit conversion operator, resulting in the two names pointing to two different objects. The new design simply points the Alias name to the original name node - not to the object. This results in a level of indirection that must be handled in the name resolution mechanism.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `apica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 69.6K Code, 8.3K Data, 77.9K Total

Debug Version: 150.0K Code, 61.7K Data, 211.7K Total

Current Release:

Non-Debug Version: 70.7K Code, 8.6K Data, 79.3K Total

Debug Version: 151.7K Code, 62.4K Data, 214.1K Total

2) Linux

Initialize thermal driver's timer before it is used. (Knut Neumann)

Allow handling negative celsius values. (Kochi Takayoshi)

Fix thermal management and make trip points. R/W (Pavel Machek)

Fix `/proc/acpi/sleep`. (P. Christeas)

IA64 fixes. (David Mosberger)

Fix reversed logic in blacklist code. (Sergio Monteiro Basto)

Replace `ACPI_DEBUG` define with `ACPI_DEBUG_OUTPUT`. (Dominik Brodowski)

3) iASL Compiler/Disassembler

Clarified some warning/error messages.

18 September 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem version 20020918:

Fixed a reported problem with reference chaining (via the Index() and RefOf() operators) in the ObjectType() and SizeOf() operators. The definition of these operators includes the dereferencing of all chained references to return information on the base object.

Fixed a problem with stores to indexed package elements - the existing code would not complete the store if an "implicit conversion" was not performed. In other words, if the existing object (package element) was to be replaced completely, the code didn't handle this case.

Relaxed typechecking on the ASL "Scope" operator to allow the target name to refer to an object of type Integer, String, or Buffer, in addition to the scoping object types (Device, predefined Scopes, Processor, PowerResource, and ThermalZone.) This allows existing AML code that has workarounds for a bug in Windows to function properly. A warning is issued, however. This affects both the AML interpreter and the iASL compiler. Below is an example of this type of ASL code:

```
Name(DEB,0x00)
Scope(DEB)
{
```

Fixed some reported problems with 64-bit integer support in the local implementation of C library functions (clib.c)

2) Linux

Use ACPI fix map region instead of IOAPIC region, since it is undefined in non-SMP.

Ensure that the SCI has the proper polarity and trigger, even on systems that do not have an interrupt override entry in the MADT.

2.5 big driver reorganization (Pat Mochel)

Use early table mapping code from acpitable.c (Andi Kleen)

New blacklist entries (Andi Kleen)

Blacklist improvements. Split blacklist code out into a separate file. Move checking the blacklist to very early. Previously, we would use ACPI tables, and then halfway through init, check the blacklist -- too late. Now, it's early enough to completely fall-back to non-ACPI.

3) iASL Compiler/Disassembler version 20020918:

Fixed a problem where the typechecking code didn't know that an alias could point to a method. In other words, aliases were not being dereferenced during typechecking.

29 August 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020829:

If the target of a Scope() operator already exists, it must be an object type that actually opens a scope -- such as a Device, Method, Scope, etc. This is a fatal runtime error. Similar error check has been added to the iASL compiler also.

Tightened up the namespace load to disallow multiple names in the same scope. This previously was allowed if both objects were of the same type. (i.e., a lookup was the same as entering a new name).

2) Linux

Ensure that the ACPI interrupt has the proper trigger and polarity.

local_irq_disable is extraneous. (Matthew Wilcox)

Make "acpi=off" actually do what it says, and not use the ACPI interpreter *or* the tables.

Added arch-neutral support for parsing SLIT and SRAT tables (Kochi Takayoshi)

3) iASL Compiler/Disassembler Version 20020829:

Implemented namepath optimization for name declarations. For

example, a declaration like "Method (_SB_ABCD)" would get optimized to "Method (ABCD)" if the declaration is within the _SB_scope. This optimization is in addition to the named reference path optimization first released in the previous version. This would seem to complete all possible optimizations for namepaths within the ASL/AML.

If the target of a Scope() operator already exists, it must be an object type that actually opens a scope -- such as a Device, Method, Scope, etc.

Implemented a check and warning for unreachable code in the same block below a Return() statement.

Fixed a problem where the listing file was not generated if the compiler aborted if the maximum error count was exceeded (200).

Fixed a problem where the typechecking of method return values was broken. This includes the check for a return value when the method is invoked as a TermArg (a return value is expected.)

Fixed a reported problem where EOF conditions during a quoted string or comment caused a fault.

15 August 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020815:

Fixed a reported problem where a Store to a method argument that contains a reference did not perform the indirect store correctly. This problem was created during the conversion to the new reference object model - the indirect store to a method argument code was not updated to reflect the new model.

Reworked the ACPI mode change code to better conform to ACPI 2.0, handle corner cases, and improve code legibility (Kochi Takayoshi)

Fixed a problem with the pathname parsing for the carat (^) prefix. The heavy use of the carat operator by the new namepath optimization in the iASL compiler uncovered a problem with the AML interpreter handling of this prefix. In the case where one or more carats precede a single nameseg, the nameseg was treated as standalone and the search rule (to root) was inadvertently applied. This could cause both the iASL compiler and the interpreter to find the wrong object or to miss the error that should occur if the object does not exist at that exact pathname.

Found and fixed the problem where the HP Pavilion DSDT would not load. This was a relatively minor tweak to the table loading code (a problem caused by the unexpected encounter with a method invocation not within a control method), but it does not solve the overall issue of the execution of AML code at the table level. This investigation is still ongoing.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 69.1K Code, 8.2K Data, 77.3K Total

Debug Version: 149.4K Code, 61.6K Data, 211.0K Total

Current Release:

Non-Debug Version: 69.6K Code, 8.3K Data, 77.9K Total

Debug Version: 150.0K Code, 61.7K Data, 211.7K Total

2) Linux

Remove redundant `slab.h` include (Brad Hards)

Fix several bugs in `thermal.c` (Herbert Nachtnebel)

Make `CONFIG_ACPI_BOOT` work properly (Pavel Machek)

Change `acpi_system_suspend` to use updated irq functions (Pavel Machek)

Export `acpi_get_firmware_table` (Matthew Wilcox)

Use proper root proc entry for ACPI (Kochi Takayoshi)

Fix early-boot table parsing (Bjorn Helgaas)

3) iASL Compiler/Disassembler

Reworked the compiler options to make them more consistent and to use two-letter options where appropriate. We were running out of sensible letters. This may break some makefiles, so check the

current options list by invoking the compiler with no parameters.

Completed the design and implementation of the ASL namepath optimization option for the compiler. This option optimizes all references to named objects to the shortest possible path. The first attempt tries to utilize a single nameseg (4 characters) and the "search-to-root" algorithm used by the interpreter. If that cannot be used (because either the name is not in the search path or there is a conflict with another object with the same name), the pathname is optimized using the caret prefix (usually a shorter string than specifying the entire path from the root.)

Implemented support to obtain the DSDT from the Windows registry (when the disassembly option is specified with no input file).

Added this code as the implementation for AcpiOsTableOverride in the Windows OSL. Migrated the 16-bit code (used in the AcpiDump utility) to scan memory for the DSDT to the AcpiOsTableOverride function in the DOS OSL to make the disassembler truly OS independent.

Implemented a new option to disassemble and compile in one step. When used without an input filename, this option will grab the DSDT from the local machine, disassemble it, and compile it in one step.

Added a warning message for invalid escapes (a backslash followed by any character other than the allowable escapes). This catches the quoted string error "_SB_" (which should be "_SB_").

Also, there are numerous instances in the ACPI specification where this error occurs.

Added a compiler option to disable all optimizations. This is basically the "compatibility mode" because by using this option, the AML code will come out exactly the same as other ASL compilers.

Added error messages for incorrectly ordered dependent resource functions. This includes: missing EndDependentFn macro at end of dependent resource list, nested dependent function macros (both start and end), and missing StartDependentFn macro. These are common errors that should be caught at compile time.

Implemented _OSI support for the disassembler and compiler. _OSI must be included in the namespace for proper disassembly (because the disassembler must know the number of arguments.)

Added an "optimization" message type that is optional (off by

default). This message is used for all optimizations - including constant folding, integer optimization, and namepath optimization.

25 July 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020725:

The AML Disassembler has been enhanced to produce compilable ASL code and has been integrated into the iASL compiler (see below) as well as the single-step disassembly for the AML debugger and the disassembler for the AcpiDump utility. All ACPI 2.0A opcodes, resource templates and macros are fully supported. The disassembler has been tested on over 30 different AML files, producing identical AML when the resulting disassembled ASL file is recompiled with the same ASL compiler.

Modified the Resource Manager to allow zero interrupts and zero dma channels during the GetCurrentResources call. This was causing problems on some platforms.

Added the AcpiOsRedirectOutput interface to the OSL to simplify output redirection for the AcpiOsPrintf and AcpiOsVprintf interfaces.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 68.7K Code, 7.4K Data, 76.1K Total

Debug Version: 142.9K Code, 58.7K Data, 201.6K Total

Current Release:

Non-Debug Version: 69.1K Code, 8.2K Data, 77.3K Total

Debug Version: 149.4K Code, 61.6K Data, 211.0K Total

2) Linux

Fixed a panic in the EC driver (Dominik Brodowski)

Implemented checksum of the R/XSDT itself during Linux table scan

(Richard Schaal)

3) iASL compiler

The AML disassembler is integrated into the compiler. The "-d" option invokes the disassembler to completely disassemble an input AML file, producing as output a text ASL file with the extension ".dsl" (to avoid name collisions with existing .asl source files.) A future enhancement will allow the disassembler to obtain the BIOS DSDT from the registry under Windows.

Fixed a problem with the VendorShort and VendorLong resource descriptors where an invalid AML sequence was created.

Implemented a fix for BufferData term in the ASL parser. It was inadvertently defined twice, allowing invalid syntax to pass and causing reduction conflicts.

Fixed a problem where the Ones opcode could get converted to a value of zero if "Ones" was used where a byte, word or dword value was expected. The 64-bit value is now truncated to the correct size with the correct value.

02 July 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020702:

The Table Manager code has been restructured to add several new features. Tables that are not required by the core subsystem (other than the FADT, DSDT, FACS, PSDTs, etc.) are no longer validated in any way and are returned from AcpiGetFirmwareTable if requested. The AcpiOsTableOverride interface is now called for each table that is loaded by the subsystem in order to allow the host to override any table it chooses. Previously, only the DSDT could be overridden. Added one new files, tbrsdt.c and tbgetall.c.

Fixed a problem with the conversion of internal package objects to external objects (when a package is returned from a control method.) The return buffer length was set to zero instead of the proper length of the package object.

Fixed a reported problem with the use of the RefOf and DeRefOf

operators when passing reference arguments to control methods. A new type of Reference object is used internally for references produced by the RefOf operator.

Added additional error messages in the Resource Manager to explain AE_BAD_DATA errors when they occur during resource parsing.

Split the AcpiEnableSubsystem into two primitives to enable a finer granularity initialization sequence. These two calls should be called in this order: AcpiEnableSubsystem (flags), AcpiInitializeObjects (flags). The flags parameter remains the same.

2) Linux

Updated the ACPI utilities module to understand the new style of fully resolved package objects that are now returned from the core subsystem. This eliminates errors of the form:

```
ACPI: PCI Interrupt Routing Table [_SB_.PCI0.PPB._.PRT]
acpi_utils-0430 [145] acpi_evaluate_reference:
  Invalid element in package (not a device reference)
```

The method evaluation utility uses the new buffer allocation scheme instead of calling AcpiEvaluate Object twice.

Added support for ECDT. This allows the use of the Embedded

Controller before the namespace has been fully initialized, which is necessary for ACPI 2.0 support, and for some laptops to initialize properly. (Laptops using ECDT are still rare, so only limited testing was performed of the added functionality.)

Fixed memory leaks in the EC driver.

Eliminated a brittle code structure in acpi_bus_init().

Eliminated the acpi_evaluate() helper function in utils.c. It is no longer needed since acpi_evaluate_object can optionally allocate memory for the return object.

Implemented fix for keyboard hang when getting battery readings on some systems (Stephen White)

PCI IRQ routing update (Dominik Brodowski)

Fix an ifdef to allow compilation on UP with LAPIC but no IOAPIC

support

11 June 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020611:

Fixed a reported problem where constants such as Zero and One appearing within _PRT packages were not handled correctly within the resource manager code. Originally reported against the ASL compiler because the code generator now optimizes integers to their minimal AML representation (i.e. AML constants if possible.) The _PRT code now handles all AML constant opcodes correctly (Zero, One, Ones, Revision).

Fixed a problem with the Concatenate operator in the AML interpreter where a buffer result object was incorrectly marked as not fully evaluated, causing a run-time error of AE_AML_INTERNAL.

All package sub-objects are now fully resolved before they are returned from the external ACPI interfaces. This means that name strings are resolved to object handles, and constant operators (Zero, One, Ones, Revision) are resolved to Integers.

Implemented immediate resolution of the AML Constant opcodes (Zero, One, Ones, Revision) to Integer objects upon detection within the AML stream. This has simplified and reduced the generated code size of the subsystem by eliminating about 10 switch statements for these constants (which previously were contained in Reference objects.) The complicating issues are that the Zero opcode is used as a "placeholder" for unspecified optional target operands and stores to constants are defined to be no-ops.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 69.3K Code, 7.4K Data, 76.7K Total

Debug Version: 143.8K Code, 58.8K Data, 202.6K Total

Current Release:

Non-Debug Version: 68.7K Code, 7.4K Data, 76.1K Total

Debug Version: 142.9K Code, 58.7K Data, 201.6K Total

2) Linux

Added preliminary support for obtaining _TRA data for PCI root bridges (Bjorn Helgaas).

3) iASL Compiler Version X2046:

Fixed a problem where the "_DDN" reserved name was defined to be a control method with one argument. There are no arguments, and _DDN does not have to be a control method.

Fixed a problem with the Linux version of the compiler where the source lines printed with error messages were the wrong lines. This turned out to be the "LF versus CR/LF" difference between Windows and Unix. This appears to be the longstanding issue concerning listing output and error messages.

Fixed a problem with the Linux version of compiler where opcode names within error messages were wrong. This was caused by a slight difference in the output of the Flex tool on Linux versus Windows.

Fixed a problem with the Linux compiler where the hex output files contained some garbage data caused by an internal buffer overrun.

17 May 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020517:

Implemented a workaround to an BIOS bug discovered on the HP OmniBook where the FADT revision number and the table size are inconsistent (ACPI 2.0 revision vs. ACPI 1.0 table size). The new behavior is to fallback to using only the ACPI 1.0 fields of the FADT if the table is too small to be a ACPI 2.0 table as claimed by the revision number. Although this is a BIOS bug, this is a case where the workaround is simple enough and with no side effects, so it seemed prudent to add it. A warning message is issued, however.

Implemented minimum size checks for the fixed-length ACPI tables -
- the FADT and FACS, as well as consistency checks between the
revision number and the table size.

Fixed a reported problem in the table override support where the
new table pointer was incorrectly treated as a physical address
instead of a logical address.

Eliminated the use of the AE_AML_ERROR exception and replaced it
with more descriptive codes.

Fixed a problem where an exception would occur if an ASL Field was
defined with no named Field Units underneath it (used by some
index fields).

Code and Data Size: Current core subsystem library sizes are shown
below. These are the code and data sizes for the acpica.lib
produced by the Microsoft Visual C++ 6.0 compiler, and these
values do not include any ACPI driver or OSPM code. The debug
version of the code includes the debug output trace mechanism and
has a larger code and data size. Note that these values will vary
depending on the efficiency of the compiler and the compiler
options used during generation.

Previous Release

Non-Debug Version: 68.8K Code, 7.1K Data, 75.9K Total

Debug Version: 142.9K Code, 58.4K Data, 201.3K Total

Current Release:

Non-Debug Version: 69.3K Code, 7.4K Data, 76.7K Total

Debug Version: 143.8K Code, 58.8K Data, 202.6K Total

2) Linux

Much work done on ACPI init (MADT and PCI IRQ routing support).
(Paul D. and Dominik Brodowski)

Fix PCI IRQ-related panic on boot (Sam Revitch)

Set BM_ARB_DIS when entering a sleep state (Ducrot Bruno)

Fix "MHz" typo (Dominik Brodowski)

Fix RTC year 2000 issue (Dominik Brodowski)

Preclude multiple button proc entries (Eric Brunet)

Moved arch-specific code out of include/platform/aclinux.h

3) iASL Compiler Version X2044:

Implemented error checking for the string used in the EISAID macro (Usually used in the definition of the _HID object.) The code now strictly enforces the PnP format - exactly 7 characters, 3 uppercase letters and 4 hex digits.

If a raw string is used in the definition of the _HID object (instead of the EISAID macro), the string must contain all alphanumeric characters (e.g., "*PNP0011" is not allowed because of the asterisk.)

Implemented checking for invalid use of ACPI reserved names for most of the name creation operators (Name, Device, Event, Mutex, OperationRegion, PowerResource, Processor, and ThermalZone.) Previously, this check was only performed for control methods.

Implemented an additional check on the Name operator to emit an error if a reserved name that must be implemented in ASL as a control method is used. We know that a reserved name must be a method if it is defined with input arguments.

The warning emitted when a namespace object reference is not found during the cross reference phase has been changed into an error. The "External" directive should be used for names defined in other modules.

4) Tools and Utilities

The 16-bit tools (adump16 and aexec16) have been regenerated and tested.

Fixed a problem with the output of both acpidump and adump16 where the indentation of closing parentheses and brackets was not

aligned properly with the parent block.

03 May 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020503:

Added support a new OSL interface that allows the host operating

system software to override the DSDT found in the firmware - AcpiOsTableOverride. With this interface, the OSL can examine the version of the firmware DSDT and replace it with a different one if desired.

Added new external interfaces for accessing ACPI registers from device drivers and other system software - AcpiGetRegister and AcpiSetRegister. This was simply an externalization of the existing AcpiHwBitRegister interfaces.

Fixed a regression introduced in the previous build where the ASL/AML CreateField operator always returned an error, "destination must be a NS Node".

Extended the maximum time (before failure) to successfully enable ACPI mode to 3 seconds.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the apica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 68.5K Code, 7.0K Data, 75.5K Total

Debug Version: 142.4K Code, 58.3K Data, 200.7K Total

Current Release:

Non-Debug Version: 68.8K Code, 7.1K Data, 75.9K Total

Debug Version: 142.9K Code, 58.4K Data, 201.3K Total

2) Linux

Enhanced ACPI init code for SMP. We are now fully MPS and \$PIR-free. While 3 out of 4 of our in-house systems work fine, the last one still hangs when testing the LAPIC timer.

Renamed many files in 2.5 kernel release to omit "acpi_" from the name.

Added warning on boot for Presario 711FR.

Sleep improvements (Pavel Machek)

ACPI can now be built without CONFIG_PCI enabled.

IA64: Fixed memory map functions (JI Lee)

3) iASL Compiler Version X2043:

Added support to allow the compiler to be integrated into the MS VC++ development environment for one-button compilation of single files or entire projects -- with error-to-source-line mapping.

Implemented support for compile-time constant folding for the Type3, Type4, and Type5 opcodes first defined in the ACPI 2.0 specification. This allows the ASL writer to use expressions instead of Integer/Buffer/String constants in terms that must evaluate to constants at compile time and will also simplify the emitted AML in any such sub-expressions that can be folded (evaluated at compile-time.) This increases the size of the compiler significantly because a portion of the ACPI CA AML interpreter is included within the compiler in order to pre-evaluate constant expressions.

Fixed a problem with the "Unicode" ASL macro that caused the compiler to fault. (This macro is used in conjunction with the _STR reserved name.)

Implemented an AML opcode optimization to use the Zero, One, and Ones opcodes where possible to further reduce the size of integer constants and thus reduce the overall size of the generated AML code.

Implemented error checking for new reserved terms for ACPI version 2.0A.

Implemented the -qr option to display the current list of ACPI reserved names known to the compiler.

Implemented the -qc option to display the current list of ASL operators that are allowed within constant expressions and can therefore be folded at compile time if the operands are constants.

4) Documentation

Updated the Programmer's Reference for new interfaces, data types, and memory allocation model options.

Updated the iASL Compiler User Reference to apply new format and add information about new features and options.

19 April 2002. Summary of changes for this release.

1) ACPI CA Core Subsystem Version 20020419:

The source code base for the Core Subsystem has been completely cleaned with PC-lint (FlexLint) for both 32-bit and 64-bit versions. The Lint option files used are included in the /acpi/generate/lint directory.

Implemented enhanced status/error checking across the entire Hardware manager subsystem. Any hardware errors (reported from the OSL) are now bubbled up and will abort a running control method.

Fixed a problem where the per-ACPI-table integer width (32 or 64) was stored only with control method nodes, causing a fault when non-control method code was executed during table loading. The solution implemented uses a global variable to indicate table width across the entire ACPI subsystem. Therefore, ACPI CA does not support mixed integer widths across different ACPI tables (DSDT, SSDT).

Fixed a problem where NULL extended fields (X fields) in an ACPI 2.0 ACPI FADT caused the table load to fail. Although the existing ACPI specification is a bit fuzzy on this topic, the new behavior is to fall back on a ACPI 1.0 field if the corresponding ACPI 2.0 X field is zero (even though the table revision indicates a full ACPI 2.0 table.) The ACPI specification will be updated to clarify this issue.

Fixed a problem with the SystemMemory operation region handler where memory was always accessed byte-wise even if the AML-specified access width was larger than a byte. This caused problems on systems with memory-mapped I/O. Memory is now accessed with the width specified. On systems that do not support non-aligned transfers, a check is made to guarantee proper address alignment before proceeding in order to avoid an AML-caused alignment fault within the kernel.

Fixed a problem with the ExtendedIrq resource where only one byte of the 4-byte Irq field was extracted.

Fixed the AcpiExDigitsNeeded() procedure to support _UID. This function was out of date and required a rewrite.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 66.6K Code, 6.5K Data, 73.1K Total

Debug Version: 139.8K Code, 57.4K Data, 197.2K Total

Current Release:

Non-Debug Version: 68.5K Code, 7.0K Data, 75.5K Total

Debug Version: 142.4K Code, 58.3K Data, 200.7K Total

2) Linux

PCI IRQ routing fixes (Dominik Brodowski)

3) iASL Compiler Version X2042:

Implemented an additional compile-time error check for a field unit whose size + minimum access width would cause a run-time access beyond the end-of-region. Previously, only the field size itself was checked.

The Core subsystem and iASL compiler now share a common parse object in preparation for compile-time evaluation of the type 3/4/5 ASL operators.

Summary of changes for this release: 03_29_02

1) ACPI CA Core Subsystem Version 20020329:

Implemented support for late evaluation of TermArg operands to Buffer and Package objects. This allows complex expressions to be used in the declarations of these object types.

Fixed an ACPI 1.0 compatibility issue when reading Fields. In ACPI 1.0, if the field was larger than 32 bits, it was returned as a

buffer - otherwise it was returned as an integer. In ACPI 2.0, the field is returned as a buffer only if the field is larger than 64 bits. The TableRevision is now considered when making this conversion to avoid incompatibility with existing ASL code.

Implemented logical addressing for AcpiOsGetRootPointer. This allows an RSDP with either a logical or physical address. With this support, the host OS can now override all ACPI tables with one logical RSDP. Includes implementation of "typed" pointer support to allow a common data type for both physical and logical pointers internally. This required a change to the AcpiOsGetRootPointer interface.

Implemented the use of ACPI 2.0 Generic Address Structures for all GPE, Fixed Event, and PM Timer I/O. This allows the use of memory mapped I/O for these ACPI features.

Initialization now ignores not only non-required tables (All tables other than the FADT, FACS, DSDT, and SSDTs), but also does not validate the table headers of unrecognized tables.

Fixed a problem where a notify handler could only be installed/removed on an object of type Device. All "notify"

objects are now supported -- Devices, Processor, Power, and Thermal.

Removed most verbosity from the ACPI_DB_INFO debug level. Only critical information is returned when this debug level is enabled.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release

Non-Debug Version: 65.4K Code, 6.2K Data, 71.6K Total

Debug Version: 138.0K Code, 56.6K Data, 194.6K Total

Current Release:

Non-Debug Version: 66.6K Code, 6.5K Data, 73.1K Total

Debug Version: 139.8K Code, 57.4K Data, 197.2K Total

2) Linux:

The processor driver (`acpi_processor.c`) now fully supports ACPI 2.0-based processor performance control (e.g. Intel(R) SpeedStep(TM) technology) Note that older laptops that only have the Intel "applet" interface are not supported through this. The 'limit' and 'performance' interface (`/proc`) are fully functional. [Note that basic policy for controlling performance state transitions will be included in the next version of `ospmid`.] The idle handler was modified to more aggressively use C2, and PIIX4 errata handling underwent a complete overhaul (big thanks to Dominik Brodowski).

Added support for ACPI-PCI device binding (`acpi_pci_root.c`). `_ADR`-based devices in the ACPI namespace are now dynamically bound (associated) with their PCI counterparts (e.g. `PCI1->01:00.0`). This allows, among other things, ACPI to resolve bus numbers for subordinate PCI bridges.

Enhanced PCI IRQ routing to get the proper bus number for `_PRT` entries defined underneath PCI bridges.

Added IBM 600E to bad bios list due to invalid `_ADR` value for PIIX4 PCI-ISA bridge, resulting in improper PCI IRQ routing.

In the process of adding full MADT support (e.g. IOAPIC) for IA32 (`acpi.c`, `mpparse.c`) -- stay tuned.

Added back visual differentiation between fixed-feature and control-method buttons in `dmesg`. Buttons are also subtyped (e.g. `button/power/PWRF`) to simplify button identification.

We no longer use `-Wno-unused` when compiling debug. Please ignore any "`_THIS_MODULE` defined but not used" messages.

Can now shut down the system using "magic sysrq" key.

3) iASL Compiler version 2041:

Fixed a problem where conversion errors for hex/octal/decimal constants were not reported.

Implemented a fix for the General Register template Address field. This field was 8 bits when it should be 64.

Fixed a problem where errors/warnings were no longer being emitted within the listing output file.

Implemented the ACPI 2.0A restriction on ACPI Table Signatures to exactly 4 characters, alphanumeric only.

Summary of changes for this release: 03_08_02

1) ACPI CA Core Subsystem Version 20020308:

Fixed a problem with AML Fields where the use of the "AccessAny" keyword could cause an interpreter error due to attempting to read or write beyond the end of the parent Operation Region.

Fixed a problem in the SystemMemory Operation Region handler where an attempt was made to map memory beyond the end of the region. This was the root cause of the "AE_ERROR" and "AE_NO_MEMORY" errors on some Linux systems.

Fixed a problem where the interpreter/namespace "search to root" algorithm was not functioning for some object types. Relaxed the internal restriction on the search to allow upsearches for all external object types as well as most internal types.

2) Linux:

We now use safe_halt() macro versus individual calls to sti | hlt.

Writing to the processor limit interface should now work. "echo 1" will increase the limit, 2 will decrease, and 0 will reset to the default.

3) ASL compiler:

Fixed segfault on Linux version.

Summary of changes for this release: 02_25_02

1) ACPI CA Core Subsystem:

Fixed a problem where the GPE bit masks were not initialized properly, causing erratic GPE behavior.

Implemented limited support for multiple calling conventions. The code can be generated with either the VPL (variable parameter list, or "C") convention, or the FPL (fixed parameter list, or "Pascal") convention. The core subsystem is about 3.4% smaller when generated with FPL.

2) Linux

Re-add some /proc/acpi/event functionality that was lost during the rewrite

Resolved issue with /proc events for fixed-feature buttons showing up as the system device.

Fixed checks on C2/C3 latencies to be inclusive of maximum values.

Replaced AE_ERRORS in acpi_osl.c with more specific error codes.

Changed ACPI PRT option from "pci=noacpi-routing" to "pci=noacpi"

Fixed limit interface & usage to fix bugs with passive cooling hysteresis.

Restructured PRT support.

Summary of changes for this label: 02_14_02

1) ACPI CA Core Subsystem:

Implemented support in AcpiLoadTable to allow loading of FACS and FADT tables.

Support for the now-obsolete interim 0.71 64-bit ACPI tables has been removed. All 64-bit platforms should be migrated to the ACPI 2.0 tables. The actbl71.h header has been removed from the source tree.

All C macros defined within the subsystem have been prefixed with "ACPI_" to avoid collision with other system include files.

Removed the return value for the two AcpiOsPrint interfaces, since

it is never used and causes lint warnings for ignoring the return value.

Added error checking to all internal mutex acquire and release calls. Although a failure from one of these interfaces is probably a fatal system error, these checks will cause the immediate abort of the currently executing method or interface.

Fixed a problem where the AcpiSetCurrentResources interface could fault. This was a side effect of the deployment of the new memory allocation model.

Fixed a couple of problems with the Global Lock support introduced in the last major build. The "common" (1.0/2.0) internal FACS was being overwritten with the FACS signature and clobbering the Global Lock pointer. Also, the actual firmware FACS was being unmapped after construction of the "common" FACS, preventing access to the actual Global Lock field within it. The "common" internal FACS is no longer installed as an actual ACPI table; it is used simply as a global.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (02_07_01)

Non-Debug Version: 65.2K Code, 6.2K Data, 71.4K Total

Debug Version: 136.9K Code, 56.4K Data, 193.3K Total

Current Release:

Non-Debug Version: 65.4K Code, 6.2K Data, 71.6K Total

Debug Version: 138.0K Code, 56.6K Data, 194.6K Total

2) Linux

Updated Linux-specific code for core macro and OSL interface changes described above.

Improved /proc/acpi/event. It now can be opened only once and has proper poll functionality.

Fixed and restructured power management (acpi_bus).

Only create /proc "view by type" when devices of that class exist.

Fixed "charging/discharging" bug (and others) in acpi_battery.

Improved thermal zone code.

3) ASL Compiler, version X2039:

Implemented the new compiler restriction on ASL String hex/octal escapes to non-null, ASCII values. An error results if an invalid value is used. (This will require an ACPI 2.0 specification change.)

AML object labels that are output to the optional C and ASM source are now prefixed with both the ACPI table signature and table ID to help guarantee uniqueness within a large BIOS project.

Summary of changes for this label: 02_01_02

1) ACPI CA Core Subsystem:

ACPI 2.0 support is complete in the entire Core Subsystem and the ASL compiler. All new ACPI 2.0 operators are implemented and all other changes for ACPI 2.0 support are complete. With simultaneous code and data optimizations throughout the subsystem, ACPI 2.0 support has been implemented with almost no additional cost in terms of code and data size.

Implemented a new mechanism for allocation of return buffers. If the buffer length is set to `ACPI_ALLOCATE_BUFFER`, the buffer will be allocated on behalf of the caller. Consolidated all return buffer validation and allocation to a common procedure. Return buffers will be allocated via the primary OSL allocation interface since it appears that a separate pool is not needed by most users. If a separate pool is required for these buffers, the caller can still use the original mechanism and pre-allocate the buffer(s).

Implemented support for string operands within the `DerefOf` operator.

Restructured the Hardware and Event managers to be table driven, simplifying the source code and reducing the amount of generated code.

Split the common read/write low-level ACPI register bitfield procedure into a separate read and write, simplifying the code considerably.

Obsoleted the AcpiOsAllocate OSL interface. This interface was used only a handful of times and didn't have enough critical mass for a separate interface. Replaced with a common calloc procedure in the core.

Fixed a reported problem with the GPE number mapping mechanism that allows GPE1 numbers to be non-contiguous with GPE0. Reorganized the GPE information and shrunk a large array that was originally large enough to hold info for all possible GPEs (256) to simply large enough to hold all GPEs up to the largest GPE number on the machine.

Fixed a reported problem with resource structure alignment on 64-bit platforms.

Changed the AcpiEnableEvent and AcpiDisableEvent external interfaces to not require any flags for the common case of enabling/disabling a GPE.

Implemented support to allow a "Notify" on a Processor object.

Most TBDs in comments within the source code have been resolved and eliminated.

Fixed a problem in the interpreter where a standalone parent prefix (^) was not handled correctly in the interpreter and debugger.

Removed obsolete and unnecessary GPE save/restore code.

Implemented Field support in the ASL Load operator. This allows a table to be loaded from a named field, in addition to loading a table directly from an Operation Region.

Implemented timeout and handle support in the external Global Lock interfaces.

Fixed a problem in the AcpiDump utility where pathnames were no longer being generated correctly during the dump of named objects.

Modified the AML debugger to give a full display of if/while predicates instead of just one AML opcode at a time. (The predicate can have several nested ASL statements.) The old method

was confusing during single stepping.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the `acpica.lib` produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (12_18_01)

Non-Debug Version: 66.1K Code, 5.5K Data, 71.6K Total

Debug Version: 138.3K Code, 55.9K Data, 194.2K Total

Current Release:

Non-Debug Version: 65.2K Code, 6.2K Data, 71.4K Total

Debug Version: 136.9K Code, 56.4K Data, 193.3K Total

2) Linux

Implemented fix for PIIX reverse throttling errata (Processor driver)

Added new Limit interface (Processor and Thermal drivers)

New thermal policy (Thermal driver)

Many updates to `/proc`

Battery "low" event support (Battery driver)

Supports ACPI PCI IRQ routing (PCI Link and PCI root drivers)

IA32 - IA64 initialization unification, no longer experimental

Menuconfig options redesigned

3) ASL Compiler, version X2037:

Implemented several new output features to simplify integration of AML code into firmware: 1) Output the AML in C source code with labels for each named ASL object. The original ASL source code is interleaved as C comments. 2) Output the AML in ASM source code with labels and interleaved ASL source. 3) Output the AML in raw hex table form, in either C or ASM.

Implemented support for optional string parameters to the LoadTable operator.

Completed support for embedded escape sequences within string literals. The compiler now supports all single character escapes as well as the Octal and Hex escapes. Note: the insertion of a null byte into a string literal (via the hex/octal escape) causes the string to be immediately terminated. A warning is issued.

Fixed a problem where incorrect AML was generated for the case where an ASL namepath consists of a single parent prefix () with no trailing name segments.

The compiler has been successfully generated with a 64-bit C compiler.

Summary of changes for this label: 12_18_01

1) Linux

Enhanced blacklist with reason and severity fields. Any table's signature may now be used to identify a blacklisted system.

Call `_PIC` control method to inform the firmware which interrupt model the OS is using. Turn on any disabled link devices.

Cleaned up `busmgr /proc` error handling (Andreas Dilger)

2) ACPI CA Core Subsystem:

Implemented ACPI 2.0 semantics for the "Break" operator (Exit from while loop)

Completed implementation of the ACPI 2.0 "Continue", "ConcatenateResTemplate", "DataTableRegion", and "LoadTable" operators. All new ACPI 2.0 operators are now implemented in both the ASL compiler and the AML interpreter. The only remaining ACPI 2.0 task is support for the String data type in the `DerefOf` operator. Fixed a problem with `AcquireMutex` where the status code was lost if the caller had to actually wait for the mutex.

Increased the maximum ASL Field size from 64K bits to 4G bits.

Completed implementation of the external Global Lock interfaces -- `AcpiAcquireGlobalLock` and `AcpiReleaseGlobalLock`. The Timeout and

Handler parameters were added.

Completed another pass at removing warnings and issues when compiling with 64-bit compilers. The code now compiles cleanly with the Intel 64-bit C/C++ compiler. Most notably, the pointer add and subtract (diff) macros have changed considerably.

Created and deployed a new ACPI_SIZE type that is 64-bits wide on 64-bit platforms, 32-bits on all others. This type is used wherever memory allocation and/or the C sizeof() operator is used, and affects the OSL memory allocation interfaces AcpiOsAllocate and AcpiOsCallocate.

Implemented sticky user breakpoints in the AML debugger.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (12_05_01)

Non-Debug Version: 64.7K Code, 5.3K Data, 70.0K Total

Debug Version: 136.2K Code, 55.6K Data, 191.8K Total

Current Release:

Non-Debug Version: 66.1K Code, 5.5K Data, 71.6K Total

Debug Version: 138.3K Code, 55.9K Data, 194.2K Total

3) ASL Compiler, version X2034:

Now checks for (and generates an error if detected) the use of a Break or Continue statement without an enclosing While statement.

Successfully generated the compiler with the Intel 64-bit C compiler.

Summary of changes for this label: 12_05_01

1) ACPI CA Core Subsystem:

The ACPI 2.0 CopyObject operator is fully implemented. This operator creates a new copy of an object (and is also used to

bypass the "implicit conversion" mechanism of the Store operator.)

The ACPI 2.0 semantics for the SizeOf operator are fully implemented. The change is that performing a SizeOf on a reference object causes an automatic dereference of the object to the actual value before the size is evaluated. This behavior was undefined in ACPI 1.0.

The ACPI 2.0 semantics for the Extended IRQ resource descriptor have been implemented. The interrupt polarity and mode are now independently set.

Fixed a problem where ASL Constants (Zero, One, Ones, Revision) appearing in Package objects were not properly converted to integers when the internal Package was converted to an external object (via the AcpiEvaluateObject interface.)

Fixed a problem with the namespace object deletion mechanism for objects created by control methods. There were two parts to this problem: 1) Objects created during the initialization phase method parse were not being deleted, and 2) The object owner ID mechanism to track objects was broken.

Fixed a problem where the use of the ASL Scope operator within a control method would result in an invalid opcode exception.

Fixed a problem introduced in the previous label where the buffer length required for the _PRT structure was not being returned correctly.

Code and Data Size: Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (11_20_01)

Non-Debug Version: 64.1K Code, 5.3K Data, 69.4K Total

Debug Version: 135.1K Code, 55.4K Data, 190.5K Total

Current Release:

Non-Debug Version: 64.7K Code, 5.3K Data, 70.0K Total

Debug Version: 136.2K Code, 55.6K Data, 191.8K Total

2) Linux:

Updated all files to apply cleanly against 2.4.16.

Added basic PCI Interrupt Routing Table (PRT) support for IA32 (acpi_pci.c), and unified the PRT code for IA32 and IA64. This version supports both static and dynamic PRT entries, but dynamic entries are treated as if they were static (not yet reconfigurable). Architecture-specific code to use this data is absent on IA32 but should be available shortly.

Changed the initialization sequence to start the ACPI interpreter (acpi_init) prior to initialization of the PCI driver (pci_init) in init/main.c. This ordering is required to support PRT and facilitate other (future) enhancement. A side effect is that the ACPI bus driver and certain device drivers can no longer be loaded as modules.

Modified the 'make menuconfig' options to allow PCI Interrupt Routing support to be included without the ACPI Bus and other device drivers.

3) ASL Compiler, version X2033:

Fixed some issues with the use of the new CopyObject and DataTableRegion operators. Both are fully functional.

Summary of changes for this label: 11_20_01

20 November 2001. Summary of changes for this release.

1) ACPI CA Core Subsystem:

Updated Index support to match ACPI 2.0 semantics. Storing a Integer, String, or Buffer to an Index of a Buffer will store only the least-significant byte of the source to the Indexed buffer byte. Multiple writes are not performed.

Fixed a problem where the access type used in an AccessAs ASL operator was not recorded correctly into the field object.

Fixed a problem where ASL Event objects were created in a signalled state. Events are now created in an unsignalled state.

The internal object cache is now purged after table loading and initialization to reduce the use of dynamic kernel memory -- on the assumption that object use is greatest during the parse phase of the entire table (versus the run-time use of individual control

methods.)

ACPI 2.0 variable-length packages are now fully operational.

Code and Data Size: Code and Data optimizations have permitted new feature development with an actual reduction in the library size.

Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (11_09_01):

Non-Debug Version: 63.7K Code, 5.2K Data, 68.9K Total

Debug Version: 134.5K Code, 55.4K Data, 189.9K Total

Current Release:

Non-Debug Version: 64.1K Code, 5.3K Data, 69.4K Total

Debug Version: 135.1K Code, 55.4K Data, 190.5K Total

2) Linux:

Enhanced the ACPI boot-time initialization code to allow the use of Local APIC tables for processor enumeration on IA-32, and to pave the way for a fully MPS-free boot (on SMP systems) in the near future. This functionality replaces arch/i386/kernel/acpitables.c, which was introduced in an earlier 2.4.15-preX release. To enable this feature you must add "acpi_boot=on" to the kernel command line -- see the help entry for CONFIG_ACPI_BOOT for more information. An IA-64 release is in the works...

Restructured the configuration options to allow boot-time table parsing support without inclusion of the ACPI Interpreter (and other) code.

NOTE: This release does not include fixes for the reported events, power-down, and thermal passive cooling issues (coming soon).

3) ASL Compiler:

Added additional typechecking for Fields within restricted access Operation Regions. All fields within EC and CMOS regions must be declared with ByteAcc. All fields withing SMBus regions must be declared with the BufferAcc access type.

Fixed a problem where the listing file output of control methods no longer interleaved the actual AML code with the ASL source code.

Summary of changes for this label: 11_09_01

1) ACPI CA Core Subsystem:

Implemented ACPI 2.0-defined support for writes to fields with a Buffer, String, or Integer source operand that is smaller than the target field. In these cases, the source operand is zero-extended to fill the target field.

Fixed a problem where a Field starting bit offset (within the parent operation region) was calculated incorrectly if the

alignment of the field differed from the access width. This affected CreateWordField, CreateDwordField, CreateQwordField, and possibly other fields that use the "AccessAny" keyword.

Fixed a problem introduced in the 11_02_01 release where indirect stores through method arguments did not operate correctly.

2) Linux:

Implemented boot-time ACPI table parsing support (CONFIG_ACPI_BOOT) for IA32 and IA64 UP/SMP systems. This code facilitates the use of ACPI tables (e.g. MADT, SRAT) rather than legacy BIOS interfaces (e.g. MPS) for the configuration of system processors, memory, and interrupts during setup_arch(). Note that this patch does not include the required architecture-specific changes required to apply this information -- subsequent patches will be posted for both IA32 and IA64 to achieve this.

Added low-level sleep support for IA32 platforms, courtesy of Pat Mochel. This allows IA32 systems to transition to/from various sleeping states (e.g. S1, S3), although the lack of a centralized driver model and power-manageable drivers will prevent its (successful) use on most systems.

Revamped the ACPI 'menuconfig' layout: created new "ACPI Support" submenu, unified IA32 and IA64 options, added new "Boot using ACPI tables" option, etc.

Increased the default timeout for the EC driver from 1ms to 10ms (1000 cycles of 10us) to try to address AE_TIME errors during EC transactions.

Summary of changes for this label: 11_02_01

1) ACPI CA Core Subsystem:

ACPI 2.0 Support: Implemented ACPI 2.0 64-bit Field access (QWordAcc keyword). All ACPI 2.0 64-bit support is now implemented.

OSL Interfaces: Several of the OSL (AcpiOs*) interfaces required changes to support ACPI 2.0 Qword field access. Read/Write PciConfiguration(), Read/Write Memory(), and Read/Write Port() now accept an ACPI_INTEGER (64 bits) as the value parameter. Also, the value parameter for the address space handler interface is now an ACPI_INTEGER. OSL implementations of these interfaces must now handle the case where the Width parameter is 64.

Index Fields: Fixed a problem where unaligned bit assembly and disassembly for IndexFields was not supported correctly.

Index and Bank Fields: Nested Index and Bank Fields are now supported. During field access, a check is performed to ensure that the value written to an Index or Bank register is not out of the range of the register. The Index (or Bank) register is written before each access to the field data. Future support will include allowing individual IndexFields to be wider than the DataRegister width.

Fields: Fixed a problem where the AML interpreter was incorrectly attempting to write beyond the end of a Field/OpRegion. This was a boundary case that occurred when a DWORD field was written to a BYTE access OpRegion, forcing multiple writes and causing the interpreter to write one datum too many.

Fields: Fixed a problem with Field/OpRegion access where the starting bit address of a field was incorrectly calculated if the current access type was wider than a byte (WordAcc, DwordAcc, or QwordAcc).

Fields: Fixed a problem where forward references to individual FieldUnits (individual Field names within a Field definition) were not resolved during the AML table load.

Fields: Fixed a problem where forward references from a Field definition to the parent Operation Region definition were not resolved during the AML table load.

Fields: Duplicate FieldUnit names within a scope are now detected during AML table load.

Acpi Interfaces: Fixed a problem where the AcpiGetName() interface returned an incorrect name for the root node.

Code and Data Size: Code and Data optimizations have permitted new feature development with an actual reduction in the library size. Current core subsystem library sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the debug output trace mechanism and has a larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Release (10_18_01):

Non-Debug Version: 63.9K Code, 5.1K Data, 69.0K Total

Debug Version: 136.7K Code, 57.4K Data, 194.2K Total

Current Release:

Non-Debug Version: 63.7K Code, 5.2K Data, 68.9K Total

Debug Version: 134.5K Code, 55.4K Data, 189.9K Total

2) Linux:

Improved /proc processor output (Pavel Machek) Re-added MODULE_LICENSE("GPL") to all modules.

3) ASL Compiler version X2030:

Duplicate FieldUnit names within a scope are now detected and flagged as errors.

4) Documentation:

Programmer Reference updated to reflect OSL and address space handler interface changes described above.

Summary of changes for this label: 10_18_01

ACPI CA Core Subsystem:

Fixed a problem with the internal object reference count mechanism that occasionally caused premature object deletion. This resolves all of the outstanding problem reports where an object is deleted in the middle of an interpreter evaluation. Although this problem only showed up in rather obscure cases, the solution to the problem involved an adjustment of all reference counts involving objects attached to namespace nodes.

Fixed a problem with Field support in the interpreter where writing to an aligned field whose length is an exact multiple (2 or greater) of the field access granularity would cause an attempt to write beyond the end of the field.

The top level AML opcode execution functions within the interpreter have been renamed with a more meaningful and consistent naming convention. The modules `exmonad.c` and `exdyadic.c` were eliminated. New modules are `exoparg1.c`, `exoparg2.c`, `exoparg3.c`, and `exoparg6.c`.

Support for the ACPI 2.0 "Mid" ASL operator has been implemented.

Fixed a problem where the AML debugger was causing some internal objects to not be deleted during subsystem termination.

Fixed a problem with the external `AcpiEvaluateObject` interface where the subsystem would fault if the named object to be evaluated referred to a constant such as `Zero`, `Ones`, etc.

Fixed a problem with `IndexFields` and `BankFields` where the subsystem would fault if the index, data, or bank registers were not defined in the same scope as the field itself.

Added `printf` format string checking for compilers that support this feature. Corrected more than 50 instances of issues with format specifiers within invocations of `ACPI_DEBUG_PRINT` throughout the core subsystem code.

The ASL "Revision" operator now returns the ACPI support level implemented in the core - the value "2" since the ACPI 2.0 support is more than 50% implemented.

Enhanced the output of the AML debugger "dump namespace" command to output in a more human-readable form.

Current core subsystem library code sizes are shown below. These

are the code and data sizes for the `acpica.lib` produced by the

Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the full debug trace mechanism -- leading to a much

larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Previous Label (09_20_01):

Non-Debug Version: 65K Code, 5K Data, 70K Total

Debug Version: 138K Code, 58K Data, 196K Total

This Label:

Non-Debug Version: 63.9K Code, 5.1K Data, 69.0K Total

Debug Version: 136.7K Code, 57.4K Data, 194.2K Total

Linux:

Implemented a "Bad BIOS Blacklist" to track machines that have known ASL/AML problems.

Enhanced the /proc interface for the thermal zone driver and added support for _HOT (the critical suspend trip point). The 'info' file now includes threshold/policy information, and allows setting of _SCP (cooling preference) and _TZP (polling frequency) values to the 'info' file. Examples: "echo tzp=5 > info" sets the polling frequency to 5 seconds, and "echo scp=1 > info" sets the cooling preference to the passive/quiet mode (if supported by the ASL).

Implemented a workaround for a gcc bug that resulted in an OOPs when loading the control method battery driver.

Summary of changes for this label: 09_20_01

ACPI CA Core Subsystem:

The AcpiEnableEvent and AcpiDisableEvent interfaces have been modified to allow individual GPE levels to be flagged as wake-enabled (i.e., these GPEs are to remain enabled when the platform sleeps.)

The AcpiEnterSleepState and AcpiLeaveSleepState interfaces now support wake-enabled GPEs. This means that upon entering the sleep state, all GPEs that are not wake-enabled are disabled. When leaving the sleep state, these GPEs are reenabled.

A local double-precision divide/modulo module has been added to enhance portability to OS kernels where a 64-bit math library is not available. The new module is "utmath.c".

Several optimizations have been made to reduce the use of CPU stack. Originally over 2K, the maximum stack usage is now below 2K at 1860 bytes (1.82k)

Fixed a problem with the AcpiGetFirmwareTable interface where the root table pointer was not mapped into a logical address properly.

Fixed a problem where a NULL pointer was being dereferenced in the interpreter code for the ASL Notify operator.

Fixed a problem where the use of the ASL Revision operator returned an error. This operator now returns the current version of the ACPI CA core subsystem.

Fixed a problem where objects passed as control method parameters to AcpiEvaluateObject were always deleted at method termination. However, these objects may end up being stored into the namespace by the called method. The object reference count mechanism was applied to these objects instead of a force delete.

Fixed a problem where static strings or buffers (contained in the AML code) that are declared as package elements within the ASL code could cause a fault because the interpreter would attempt to delete them. These objects are now marked with the "static object" flag to prevent any attempt to delete them.

Implemented an interpreter optimization to use operands directly from the state object instead of extracting the operands to local variables. This reduces stack use and code size, and improves performance.

The module exxface.c was eliminated as it was an unnecessary extra layer of code.

Current core subsystem library code sizes are shown below. These are the code and data sizes for the acpica.lib produced by the Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the full debug trace mechanism -- leading to a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Non-Debug Version: 65K Code, 5K Data, 70K Total

(Previously 69K) Debug Version: 138K Code, 58K Data, 196K
Total (Previously 195K)

Linux:

Support for ACPI 2.0 64-bit integers has been added. All ACPI
Integer objects are now 64 bits wide

All Acpi data types and structures are now in lower case. Only
Acpi macros are upper case for differentiation.

Documentation:

Changes to the external interfaces as described above.

Summary of changes for this label: 08_31_01

ACPI CA Core Subsystem:

A bug with interpreter implementation of the ASL Divide operator
was found and fixed. The implicit function return value (not the
explicit store operands) was returning the remainder instead of
the quotient. This was a longstanding bug and it fixes several
known outstanding issues on various platforms.

The ACPI_DEBUG_PRINT and function trace entry/exit macros have
been further optimized for size. There are 700 invocations of the
DEBUG_PRINT macro alone, so each optimization reduces the size of
the debug version of the subsystem significantly.

A stack trace mechanism has been implemented. The maximum stack
usage is about 2K on 32-bit platforms. The debugger command "stat
stack" will display the current maximum stack usage.

All public symbols and global variables within the subsystem are
now prefixed with the string "Acpi". This keeps all of the
symbols grouped together in a kernel map, and avoids conflicts
with other kernel subsystems.

Most of the internal fixed lookup tables have been moved into the
code segment via the const operator.

Several enhancements have been made to the interpreter to both
reduce the code size and improve performance.

Current core subsystem library code sizes are shown below. These
are the code and data sizes for the acpica.lib produced by the

Microsoft Visual C++ 6.0 compiler, and these values do not include any ACPI driver or OSPM code. The debug version of the code includes the full debug trace mechanism which contains over 700 invocations of the DEBUG_PRINT macro, 500 function entry macro invocations, and over 900 function exit macro invocations -- leading to a much larger code and data size. Note that these values will vary depending on the efficiency of the compiler and the compiler options used during generation.

Non-Debug Version: 64K Code, 5K Data, 69K Total
Debug Version: 137K Code, 58K Data, 195K Total

Linux:

Implemented wbinvd() macro, pending a kernel-wide definition.

Fixed /proc/acpi/event to handle poll() and short reads.

ASL Compiler, version X2026:

Fixed a problem introduced in the previous label where the AML code emitted for package objects produced packages with zero length.

Summary of changes for this label: 08_16_01

ACPI CA Core Subsystem:

The following ACPI 2.0 ASL operators have been implemented in the AML interpreter (These are already supported by the Intel ASL compiler): ToDecimalString, ToHexString, ToString, ToInteger, and ToBuffer. Support for 64-bit AML constants is implemented in the AML parser, debugger, and disassembler.

The internal memory tracking mechanism (leak detection code) has been upgraded to reduce the memory overhead (a separate tracking block is no longer allocated for each memory allocation), and now supports all of the internal object caches.

The data structures and code for the internal object caches have been coalesced and optimized so that there is a single cache and memory list data structure and a single group of functions that implement generic cache management. This has reduced the code size in both the debug and release versions of the subsystem.

The DEBUG_PRINT macro(s) have been optimized for size and replaced

by ACPI_DEBUG_PRINT. The syntax for this macro is slightly different, because it generates a single call to an internal function. This results in a savings of about 90 bytes per invocation, resulting in an overall code and data savings of about 16% in the debug version of the subsystem.

Linux:

Fixed C3 disk corruption problems and re-enabled C3 on supporting machines.

Integrated low-level sleep code by Patrick Mochel.

Further tweaked source code Linuxization.

Other minor fixes.

ASL Compiler:

Support for ACPI 2.0 variable length packages is fixed/completed.

Fixed a problem where the optional length parameter for the ACPI 2.0 ToString operator.

Fixed multiple extraneous error messages when a syntax error is detected within the declaration line of a control method.

Summary of changes for this label: 07_17_01

ACPI CA Core Subsystem:

Added a new interface named AcpiGetFirmwareTable to obtain any ACPI table via the ACPI signature. The interface can be called at any time during kernel initialization, even before the kernel virtual memory manager is initialized and paging is enabled. This allows kernel subsystems to obtain ACPI tables very early, even before the ACPI CA subsystem is initialized.

Fixed a problem where Fields defined with the AnyAcc attribute could be resolved to the incorrect address under the following conditions: 1) the field width is larger than 8 bits and 2) the parent operation region is not defined on a DWORD boundary.

Fixed a problem where the interpreter is not being locked during namespace initialization (during execution of the _INI control methods), causing an error when an attempt is made to release it later.

ACPI 2.0 support in the AML Interpreter has begun and will be ongoing throughout the rest of this year. In this label, The Mod operator is implemented.

Added a new data type to contain full PCI addresses named `ACPI_PCI_ID`. This structure contains the PCI Segment, Bus, Device, and Function values.

Linux:

Enhanced the Linux version of the source code to change most capitalized ACPI type names to lowercase. For example, all instances of `ACPI_STATUS` are changed to `acpi_status`. This will result in a large diff, but the change is strictly cosmetic and aligns the CA code closer to the Linux coding standard.

OSL Interfaces:

The interfaces to the PCI configuration space have been changed to add the PCI Segment number and to split the single 32-bit combined DeviceFunction field into two 16-bit fields. This was accomplished by moving the four values that define an address in PCI configuration space (segment, bus, device, and function) to the new `ACPI_PCI_ID` structure.

The changes to the PCI configuration space interfaces led to a reexamination of the complete set of address space access interfaces for PCI, I/O, and Memory. The previously existing 18 interfaces have proven difficult to maintain (any small change must be propagated across at least 6 interfaces) and do not easily allow for future expansion to 64 bits if necessary. Also, on some systems, it would not be appropriate to demultiplex the access width (8, 16, 32, or 64) before calling the OSL if the corresponding native OS interfaces contain a similar access width parameter. For these reasons, the 18 address space interfaces have been replaced by these 6 new ones:

- AcpiOsReadPciConfiguration
- AcpiOsWritePciConfiguration
- AcpiOsReadMemory
- AcpiOsWriteMemory
- AcpiOsReadPort
- AcpiOsWritePort

Added a new interface named `AcpiOsGetRootPointer` to allow the OSL to perform the platform and/or OS-specific actions necessary to obtain the ACPI RSDP table pointer. On IA-32 platforms, this

interface will simply call down to the CA core to perform the low-memory search for the table. On IA-64, the RSDP is obtained from EFI. Migrating this interface to the OSL allows the CA core to remain OS and platform independent.

Added a new interface named AcpiOsSignal to provide a generic "function code and pointer" interface for various miscellaneous signals and notifications that must be made to the host OS. The first such signals are intended to support the ASL Fatal and Breakpoint operators. In the latter case, the AcpiOsBreakpoint interface has been obsoleted.

The definition of the AcpiFormatException interface has been changed to simplify its use. The caller no longer must supply a buffer to the call; A pointer to a const string is now returned directly. This allows the call to be easily used in printf statements, etc. since the caller does not have to manage a local buffer.

ASL Compiler, Version X2025:

The ACPI 2.0 Switch/Case/Default operators have been implemented and are fully functional. They will work with all ACPI 1.0 interpreters, since the operators are simply translated to If/Else pairs.

The ACPI 2.0 ElseIf operator is implemented and will also work with 1.0 interpreters, for the same reason.

Implemented support for ACPI 2.0 variable-length packages. These packages have a separate opcode, and their size is determined by the interpreter at run-time.

Documentation The ACPI CA Programmer Reference has been updated to reflect the new interfaces and changes to existing interfaces.

Summary of changes for this label: 06_15_01

ACPI CA Core Subsystem:

Fixed a problem where a DWORD-accessed field within a Buffer object would get its byte address inadvertently rounded down to the nearest DWORD. Buffers are always Byte-accessible.

ASL Compiler, version X2024:

Fixed a problem where the Switch() operator would either fault or hang the compiler. Note however, that the AML code for this ACPI 2.0 operator is not yet implemented.

Compiler uses the new AcpiOsGetTimer interface to obtain compile timings.

Implementation of the CreateField operator automatically converts a reference to a named field within a resource descriptor from a byte offset to a bit offset if required.

Added some missing named fields from the resource descriptor support. These are the names that are automatically created by the compiler to reference fields within a descriptor. They are only valid at compile time and are not passed through to the AML interpreter.

Resource descriptor named fields are now typed as Integers and subject to compile-time typechecking when used in expressions.

Summary of changes for this label: 05_18_01

ACPI CA Core Subsystem:

Fixed a couple of problems in the Field support code where bits from adjacent fields could be returned along with the proper field bits. Restructured the field support code to improve performance, readability and maintainability.

New DEBUG_PRINTP macro automatically inserts the procedure name into the output, saving hundreds of copies of procedure name strings within the source, shrinking the memory footprint of the debug version of the core subsystem.

Source Code Structure:

The source code directory tree was restructured to reflect the current organization of the component architecture. Some files and directories have been moved and/or renamed.

Linux:

Fixed leaking kacpidpc processes.

Fixed queueing event data even when /proc/acpi/event is not opened.

ASL Compiler, version X2020:

Memory allocation performance enhancement - over 24X compile time improvement on large ASL files. Parse nodes and namestring buffers are now allocated from a large internal compiler buffer.

The temporary .SRC file is deleted unless the "-s" option is specified

The "-d" debug output option now sends all output to the .DBG file instead of the console.

"External" second parameter is now optional

"ElseIf" syntax now properly allows the predicate

Last operand to "Load" now recognized as a Target operand

Debug object can now be used anywhere as a normal object.

ResourceTemplate now returns an object of type BUFFER

EISAID now returns an object of type INTEGER

"Index" now works with a STRING operand

"LoadTable" now accepts optional parameters

"ToString" length parameter is now optional

"Interrupt (ResourceType," parse error fixed.

"Register" with a user-defined region space parse error fixed

Escaped backslash at the end of a string ("\\") scan/parse error fixed

"Revision" is now an object of type INTEGER.

Summary of changes for this label: 05_02_01

Linux:

/proc/acpi/event now blocks properly.

Removed /proc/sys/acpi. You can still dump your DSDT from /proc/acpi/dsdt.

ACPI CA Core Subsystem:

Fixed a problem introduced in the previous label where some of the "small" resource descriptor types were not recognized.

Improved error messages for the case where an ASL Field is outside the range of the parent operation region.

ASL Compiler, version X2018:

Added error detection for ASL Fields that extend beyond the length of the parent operation region (only if the length of the region is known at compile time.) This includes fields that have a minimum access width that is smaller than the parent region, and individual field units that are partially or entirely beyond the extent of the parent.

Summary of changes for this label: 04_27_01

ACPI CA Core Subsystem:

Fixed a problem where the namespace mutex could be released at the wrong time during execution of AcpiRemoveAddressSpaceHandler.

Added optional thread ID output for debug traces, to simplify debugging of multiple threads. Added context switch notification when the debug code realizes that a different thread is now executing ACPI code.

Some additional external data types have been prefixed with the string "ACPI_" for consistency. This may effect existing code. The data types affected are the external callback typedefs - e.g.,

WALK_CALLBACK becomes ACPI_WALK_CALLBACK.

Linux:

Fixed an issue with the OSL semaphore implementation where a thread was waking up with an error from receiving a SIGCHLD signal.

Linux version of ACPI CA now uses the system C library for string manipulation routines instead of a local implementation.

Cleaned up comments and removed TBDs.

ASL Compiler, version X2017:

Enhanced error detection and reporting for all file I/O operations.

Documentation:

Programmer Reference updated to version 1.06.

Summary of changes for this label: 04_13_01

ACPI CA Core Subsystem:

Restructured support for BufferFields and RegionFields. BankFields support is now fully operational. All known 32-bit limitations on field sizes have been removed. Both BufferFields and (Operation) RegionFields are now supported by the same field management code.

Resource support now supports QWORD address and IO resources. The 16/32/64 bit address structures and the Extended IRQ structure have been changed to properly handle Source Resource strings.

A ThreadId of -1 is now used to indicate a "mutex not acquired" condition internally and must never be returned by AcpiOsThreadId. This reserved value was changed from 0 since Unix systems allow a thread ID of 0.

Linux:

Driver code reorganized to enhance portability

Added a kernel configuration option to control ACPI_DEBUG

Fixed the EC driver to honor _GLK.

ASL Compiler, version X2016:

Fixed support for the "FixedHw" keyword. Previously, the FixedHw

address space was set to 0, not 0x7f as it should be.

Summary of changes for this label: 03_13_01

ACPI CA Core Subsystem:

During ACPI initialization, the `_SB_.INI` method is now run if present.

Notify handler fix - notifies are deferred until the parent method completes execution. This fixes the "mutex already acquired" issue seen occasionally.

Part of the "implicit conversion" rules in ACPI 2.0 have been found to cause compatibility problems with existing ASL/AML. The convert "result-to-target-type" implementation has been removed for stores to method Args and Locals. Source operand conversion is still fully implemented. Possible changes to ACPI 2.0 specification pending.

Fix to `AcpiRsCalculatePciRoutingTableLength` to return correct length.

Fix for compiler warnings for 64-bit compiles.

Linux:

/proc output aligned for easier parsing.

Release-version compile problem fixed.

New kernel configuration options documented in `Configure.help`.

IBM 600E - Fixed Sleep button may generate "Invalid <NULL> context" message.

OSPM:

Power resource driver integrated with bus manager.

Fixed kernel fault during active cooling for thermal zones.

Source Code:

The source code tree has been restructured.

Summary of changes for this label: 03_02_01

Linux OS Services Layer (OSL):

Major revision of all Linux-specific code.

Modularized all ACPI-specific drivers.

Added new thermal zone and power resource drivers.

Revamped /proc interface (new functionality is under /proc/acpi).

New kernel configuration options.

Linux known issues:

New kernel configuration options not documented in Configure.help yet.

Module dependencies not currently implemented. If used, they should be loaded in this order: busmgr, power, ec, system, processor, battery, ac_adapter, button, thermal.

Modules will not load if CONFIG_MODVERSION is set.

IBM 600E - entering S5 may reboot instead of shutting down.

IBM 600E - Sleep button may generate "Invalid <NULL> context" message.

Some systems may fail with "execution mutex already acquired" message.

ACPI CA Core Subsystem:

Added a new OSL Interface, AcpiOsGetThreadId. This was required for the deadlock detection code. Defined to return a non-zero, 32-bit thread ID for the currently executing thread. May be a non-zero constant integer on single-thread systems.

Implemented deadlock detection for internal subsystem mutexes. We may add conditional compilation for this code (debug only) later.

ASL/AML Mutex object semantics are now fully supported. This includes multiple acquires/releases by owner and support for the

Mutex SyncLevel parameter.

A new "Force Release" mechanism automatically frees all ASL Mutexes that have been acquired but not released when a thread exits the interpreter. This forces conformance to the ACPI spec ("All mutexes must be released when an invocation exits") and prevents deadlocked ASL threads. This mechanism can be expanded (later) to monitor other resource acquisitions if OEM ASL code continues to misbehave (which it will).

Several new ACPI exception codes have been added for the Mutex support.

Recursive method calls are now allowed and supported (the ACPI spec does in fact allow recursive method calls.) The number of recursive calls is subject to the restrictions imposed by the `SERIALIZED` method keyword and `SyncLevel` (ACPI 2.0) method parameter.

Implemented support for the `SyncLevel` parameter for control methods (ACPI 2.0 feature)

Fixed a deadlock problem when multiple threads attempted to use the interpreter.

Fixed a problem where the string length of a String package element was not always set in a package returned from `AcpiEvaluateObject`.

Fixed a problem where the length of a String package element was not always included in the length of the overall package returned from `AcpiEvaluateObject`.

Added external interfaces (`Acpi*`) to the ACPI debug memory manager. This manager keeps a list of all outstanding allocations, and can therefore detect memory leaks and attempts to free memory blocks more than once. Useful for code such as the power manager, etc. May not be appropriate for device drivers. Performance with the debug code enabled is slow.

The ACPI Global Lock is now an optional hardware element.

ASL Compiler Version X2015:

Integrated changes to allow the compiler to be generated on multiple platforms.

Linux makefile added to generate the compiler on Linux

Source Code:

All platform-specific headers have been moved to their own subdirectory, Include/Platform.

New source file added, Interpreter/ammutex.c

New header file, Include/acstruct.h

Documentation:

The programmer reference has been updated for the following new interfaces: AcpiOsGetThreadId AcpiAllocate AcpiCallocate AcpiFree

Summary of changes for this label: 02_08_01

Core ACPI CA Subsystem: Fixed a problem where an error was incorrectly returned if the return resource buffer was larger than the actual data (in the resource interfaces).

References to named objects within packages are resolved to the full pathname string before packages are returned directly (via the AcpiEvaluateObject interface) or indirectly via the resource interfaces.

Linux OS Services Layer (OSL):

Improved /proc battery interface.

Added C-state debugging output and other miscellaneous fixes.

ASL Compiler Version X2014:

All defined method arguments can now be used as local variables, including the ones that are not actually passed in as parameters. The compiler tracks initialization of the arguments and issues an exception if they are used without prior assignment (just like locals).

The -o option now specifies a filename prefix that is used for all output files, including the AML output file. Otherwise, the default behavior is as follows: 1) the AML goes to the file specified in the DSDT. 2) all other output files use the input

source filename as the base.

Summary of changes for this label: 01_25_01

Core ACPI CA Subsystem: Restructured the implementation of object store support within the interpreter. This includes support for the Store operator as well as any ASL operators that include a target operand.

Partially implemented support for Implicit Result-to-Target conversion. This is when a result object is converted on the fly to the type of an existing target object. Completion of this support is pending further analysis of the ACPI specification concerning this matter.

CPU-specific code has been removed from the subsystem (hardware directory).

New Power Management Timer functions added

Linux OS Services Layer (OSL): Moved system state transition code to the core, fixed it, and modified Linux OSL accordingly.

Fixed C2 and C3 latency calculations.

We no longer use the compilation date for the version message on initialization, but retrieve the version from AcpiGetSystemInfo().

Incorporated for fix Sony VAIO machines.

Documentation: The Programmer Reference has been updated and reformatted.

ASL Compiler: Version X2013: Fixed a problem where the line numbering and error reporting could get out of sync in the presence of multiple include files.

Summary of changes for this label: 01_15_01

Core ACPI CA Subsystem:

Implemented support for type conversions in the execution of the ASL Concatenate operator (The second operand is converted to match the type of the first operand before concatenation.)

Support for implicit source operand conversion is partially implemented. The ASL source operand types Integer, Buffer, and String are freely interchangeable for most ASL operators and are converted by the interpreter on the fly as required. Implicit Target operand conversion (where the result is converted to the target type before storing) is not yet implemented.

Support for 32-bit and 64-bit BCD integers is implemented.

Problem fixed where a field read on an aligned field could cause a read past the end of the field.

New exception, AE_AML_NO_RETURN_VALUE, is returned when a method does not return a value, but the caller expects one. (The ASL compiler flags this as a warning.)

ASL Compiler:

Version X2011:

1. Static typechecking of all operands is implemented. This prevents the use of invalid objects (such as using a Package where an Integer is required) at compile time instead of at interpreter run-time.
2. The ASL source line is printed with ALL errors and warnings.
3. Bug fix for source EOF without final linefeed.
4. Debug option is split into a parse trace and a namespace trace.
5. Namespace output option (-n) includes initial values for integers and strings.
6. Parse-only option added for quick syntax checking.
7. Compiler checks for duplicate ACPI name declarations

Version X2012:

1. Relaxed typechecking to allow interchangeability between strings, integers, and buffers. These types are now converted by the interpreter at runtime.
2. Compiler reports time taken by each internal subsystem in the debug output file.

Summary of changes for this label: 12_14_00

ASL Compiler:

This is the first official release of the compiler. Since the compiler requires elements of the Core Subsystem, this label synchronizes everything.

Summary of changes for this label: 12_08_00

Fixed a problem where named references within the ASL definition of both OperationRegions and CreateXXXFields did not work properly. The symptom was an AE_AML_OPERAND_TYPE during initialization of the region/field. This is similar (but not related internally) to the problem that was fixed in the last label.

Implemented both 32-bit and 64-bit support for the BCD ASL functions ToBCD and FromBCD.

Updated all legal headers to include "2000" in the copyright years.

Summary of changes for this label: 12_01_00

Fixed a problem where method invocations within the ASL definition of both OperationRegions and CreateXXXFields did not work properly. The symptom was an AE_AML_OPERAND_TYPE during initialization of the region/field:

nsinit-0209: AE_AML_OPERAND_TYPE while getting region arguments
[DEBUG] ammonad-0284: Exec_monadic2_r/Not: bad operand(s)
(0x3005)

Fixed a problem where operators with more than one nested subexpression would fail. The symptoms were varied, by mostly AE_AML_OPERAND_TYPE errors. This was actually a rather serious problem that has gone unnoticed until now.

Subtract (Add (1,2), Multiply (3,4))

Fixed a problem where AcpiGetHandle didn't quite get fixed in the previous build (The prefix part of a relative path was handled incorrectly).

Fixed a problem where Operation Region initialization failed if the operation region name was a "namepath" instead of a simple "nameseg". Symptom was an AE_NO_OPERAND error.

Fixed a problem where an assignment to a local variable via the indirect RefOf mechanism only worked for the first such assignment. Subsequent assignments were ignored.

Summary of changes for this label: 11_15_00

ACPI 2.0 table support with backwards support for ACPI 1.0 and the 0.71 extensions. Note: although we can read ACPI 2.0 BIOS tables, the AML interpreter does NOT have support for the new 2.0 ASL grammar terms at this time.

All ACPI hardware access is via the GAS structures in the ACPI 2.0 FADT.

All physical memory addresses across all platforms are now 64 bits wide. Logical address width remains dependent on the platform (i.e., "void *").

AcpiOsMapMemory interface changed to a 64-bit physical address.

The AML interpreter integer size is now 64 bits, as per the ACPI 2.0 specification.

For backwards compatibility with ACPI 1.0, ACPI tables with a revision number less than 2 use 32-bit integers only.

Fixed a problem where the evaluation of OpRegion operands did not always resolve them to numbers properly.

Summary of changes for this label: 10_20_00

Fix for CBN_._STA issue. This fix will allow correct access to CBN_ OpRegions when the _STA returns 0x8.

Support to convert ACPI constants (Ones, Zeros, One) to actual values before a package object is returned

Fix for method call as predicate to if/while construct causing incorrect if/while behavior

Fix for Else block package lengths sometimes calculated wrong (if block > 63 bytes)

Fix for Processor object length field, was always zero

Table load abort if FACP sanity check fails

Fix for problem with Scope(name) if name already exists

Warning emitted if a named object referenced cannot be found (resolved) during method execution.

Summary of changes for this label: 9_29_00

New table initialization interfaces: AcpiInitializeSubsystem no longer has any parameters AcpiFindRootPointer - Find the RSDP (if necessary) AcpiLoadTables (RSDP) - load all tables found at RSDP->RSDT Obsolete Interfaces AcpiLoadFirmwareTables - replaced by AcpiLoadTables

Note: These interface changes require changes to all existing OSDs

The PCI_Config default address space handler is always installed at the root namespace object.

Summary of changes for this label: 09_15_00

The new initialization architecture is implemented. New interfaces are: AcpiInitializeSubsystem (replaces AcpiInitialize) AcpiEnableSubsystem Obsolete Interfaces: AcpiLoadNamespace

(Namespace is automatically loaded when a table is loaded)

The ACPI_OPERAND_OBJECT has been optimized to shrink its size from 52 bytes to 32 bytes. There is usually one of these for every namespace object, so the memory savings is significant.

Implemented just-in-time evaluation of the CreateField operators.

Bug fixes for IA-64 support have been integrated.

Additional code review comments have been implemented

The so-called "third pass parse" has been replaced by a final walk through the namespace to initialize all operation regions (address spaces) and fields that have not yet been initialized during the execution of the various _INI and REG methods.

New file - namespace/nsinit.c

Summary of changes for this label: 09_01_00

Namespace manager data structures have been reworked to change the primary object from a table to a single object. This has resulted in dynamic memory savings of 3X within the namespace and 2X overall in the ACPI CA subsystem.

Fixed problem where the call to AcpiEvFindPciRootBuses was inadvertently left commented out.

Reduced the warning count when generating the source with the GCC compiler.

Revision numbers added to each module header showing the SourceSafe version of the file. Please refer to this version number when giving us feedback or comments on individual modules.

The main object types within the subsystem have been renamed to clarify their purpose:

ACPI_INTERNAL_OBJECT -> ACPI_OPERAND_OBJECT
ACPI_GENERIC_OP -> ACPI_PARSE_OBJECT
ACPI_NAME_TABLE_ENTRY -> ACPI_NAMESPACE_NODE

NOTE: no changes to the initialization sequence are included in this label.

Summary of changes for this label: 08_23_00

Fixed problem where TerminateControlMethod was being called multiple times per method

Fixed debugger problem where single stepping caused a semaphore to be oversignalled

Improved performance through additional parse object caching - added ACPI_EXTENDED_OP type

Summary of changes for this label: 08_10_00

Parser/Interpreter integration: Eliminated the creation of complete parse trees for ACPI tables and control methods. Instead, parse subtrees are created and then deleted as soon as they are processed (Either entered into the namespace or executed by the interpreter). This reduces the use of dynamic kernel memory significantly. (about 10X)

Exception codes broken into classes and renumbered. Be sure to recompile all code that includes `acexcep.h`. Hopefully we won't have to renumber the codes again now that they are split into classes (environment, programmer, AML code, ACPI table, and internal).

Fixed some additional alignment issues in the Resource Manager subcomponent

Implemented semaphore tracking in the `AcpiExec` utility, and fixed several places where mutexes/semaphores were being unlocked without a corresponding lock operation. There are no known semaphore or mutex "leaks" at this time.

Fixed the case where an ASL Return operator is used to return an unnamed package.

Summary of changes for this label: 07_28_00

Fixed a problem with the way addresses were calculated in `AcpiAmlReadFieldData()` and `AcpiAmlWriteFieldData()`. This problem manifested itself when a Field was created with `WordAccess` or `DwordAccess`, but the field unit defined within the Field was less than a Word or Dword.

Fixed a problem in `AmlDumpOperands()` module's loop to pull operands off of the operand stack to display information. The problem manifested itself as a TLB error on 64-bit systems when accessing an operand stack with two or more operands.

Fixed a problem with the PCI configuration space handlers where context was getting confused between accesses. This required a change to the generic address space handler and address space setup definitions. Handlers now get both a global handler context (this is the one passed in by the user when executing `AcpiInstallAddressSpaceHandler()`) and a specific region context that is unique to each region (For example, the `_ADR`, `_SEG` and `_BBN` values associated with a specific region). The generic function definitions have changed to the following:

```
typedef ACPI_STATUS (*ADDRESS_SPACE_HANDLER) ( UINT32 Function,
UINT32 Address, UINT32 BitWidth, UINT32 *Value, void
*HandlerContext, // This used to be void *Context void
*RegionContext); // This is an additional parameter
```

```
typedef ACPI_STATUS (*ADDRESS_SPACE_SETUP) ( ACPI_HANDLE
RegionHandle, UINT32 Function, void *HandlerContext, void
**RegionContext); // This used to be **ReturnContext
```

Summary of changes for this label: 07_21_00

Major file consolidation and rename. All files within the interpreter have been renamed as well as most header files. This was done to prevent collisions with existing files in the host OSs -- filenames such as "config.h" and "global.h" seem to be quite common. The VC project files have been updated. All makefiles will require modification.

The parser/interpreter integration continues in Phase 5 with the implementation of a complete 2-pass parse (the AML is parsed twice) for each table; This avoids the construction of a huge parse tree and therefore reduces the amount of dynamic memory required by the subsystem. Greater use of the parse object cache means that performance is unaffected.

Many comments from the two code reviews have been rolled in.

The 64-bit alignment support is complete.

Summary of changes for this label: 06_30_00

With a nod and a tip of the hat to the technology of yesteryear, we've added support in the source code for 80 column output devices. The code is now mostly constrained to 80 columns or less to support environments and editors that 1) cannot display or print more than 80 characters on a single line, and 2) cannot disable line wrapping.

A major restructuring of the namespace data structure has been completed. The result is 1) cleaner and more understandable/maintainable code, and 2) a significant reduction in the dynamic memory requirement for each named ACPI object (almost half).

Summary of changes for this label: 06_23_00

Linux support has been added. In order to obtain approval to get the ACPI CA subsystem into the Linux kernel, we've had to make quite a few changes to the base subsystem that will affect all users (all the changes are generic and OS- independent). The

effects of these global changes have been somewhat far reaching. Files have been merged and/or renamed and interfaces have been renamed. The major changes are described below.

Osd* interfaces renamed to AcpiOs* to eliminate namespace pollution/confusion within our target kernels. All OSD interfaces must be modified to match the new naming convention.

Files merged across the subsystem. A number of the smaller source and header files have been merged to reduce the file count and increase the density of the existing files. There are too many to list here. In general, makefiles that call out individual files will require rebuilding.

Interpreter files renamed. All interpreter files now have the prefix am* instead of ie* and is*.

Header files renamed: The acapi.h file is now acpixf.h. The apciosl.h file is now apciosxf.h. We are removing references to the acronym "API" since it is somewhat windowsy. The new name is "external interface" or xface or xf in the filenames.j

All manifest constants have been forced to upper case (some were mixed case.) Also, the string "ACPI_" has been prepended to many (not all) of the constants, typedefs, and structs.

The globals "DebugLevel" and "DebugLayer" have been renamed "AcpiDbgLevel" and "AcpiDbgLayer" respectively.

All other globals within the subsystem are now prefixed with "AcpiGbl_" Internal procedures within the subsystem are now prefixed with "Acpi" (with only a few exceptions). The original two-letter abbreviation for the subcomponent remains after "Acpi" - for example, CmCallocate became AcpiCmCallocate.

Added a source code translation/conversion utility. Used to generate the Linux source code, it can be modified to generate other types of source as well. Can also be used to cleanup existing source by removing extraneous spaces and blank lines. Found in tools/acpiscrc/*

OsdUnMapMemory was renamed to OsdUnmapMemory and then AcpiOsUnmapMemory. (UnMap became Unmap).

A "MaxUnits" parameter has been added to AcpiOsCreateSemaphore. When set to one, this indicates that the caller wants to use the

semaphore as a mutex, not a counting semaphore. ACPI CA uses both types. However, implementers of this call may want to use different OS primitives depending on the type of semaphore requested. For example, some operating systems provide separate

"mutex" and "semaphore" interfaces - where the mutex interface is much faster because it doesn't have all the overhead of a full semaphore implementation.

Fixed a deadlock problem where a method that accesses the PCI address space can block forever if it is the first access to the space.

Summary of changes for this label: 06_02_00

Support for environments that cannot handle unaligned data accesses (e.g. firmware and OS environments devoid of alignment handler technology namely SAL/EFI and the IA-64 Linux kernel) has been added (via configurable macros) in these three areas: - Transfer of data from the raw AML byte stream is done via byte moves instead of word/dword/qword moves. - External objects are aligned within the user buffer, including package elements (sub-objects). - Conversion of name strings to UINT32 Acpi Names is now done byte-wise.

The Store operator was modified to mimic Microsoft's implementation when storing to a Buffer Field.

Added a check of the BM_STS bit before entering C3.

The methods subdirectory has been obsoleted and removed. A new file, cmeval.c subsumes the functionality.

A 16-bit (DOS) version of AcpiExec has been developed. The makefile is under the acpiexec directory.

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- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/namespace/nsdump.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/include/acresrc.h

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- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/include/acnamesp.h
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- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/parser/psscope.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/parser/psxface.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/include/acdisasm.h
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/utilities/utmutex.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/os_specific/service_layers/oswintbl.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/tools/acpextract/axmain.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/include/aconfig.h
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/events/evxfregn.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/include/acmacros.h
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/resources/rscal.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/resources/rslist.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/compiler/aslmap.c
- * /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/compiler/aslopcode.c
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* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/events/evxface.c

* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/namespace/nsaccess.c

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* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/disassembler/dmnames.c

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* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/disassembler/dmwalk.c

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* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/debugger/dbdisply.c
* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/dispatcher/dsopcode.c
* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/compiler/dttable.c
* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/utilities/utinit.c
* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/include/platform/acnetbsd.h
* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/tools/acpihelp/ahpredef.c
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```
% {  
/*****  
*  
* Module Name: dtparser.y - Bison input file for table compiler parser  
*  
*****/  
  
/*****  
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*

*****/

#include "aslcompiler.h"

#include "dtcompiler.h"

#define _COMPONENT DT_COMPILER
 ACPI_MODULE_NAME ("dtparser")

int DtParserlex (void);
 int DtParserparse (void);
 void DtParsererror (char const *msg);
 extern char *DtParsestext;
 extern DT_FIELD *Gbl_CurrentField;

UINT64 DtParserResult; /* Expression return value */

/* Bison/yacc configuration */

#define yyname DtParsername
 #define YYDEBUG 1 /* Enable debug output */
 #define YYERROR_VERBOSE 1 /* Verbose error messages */
 #define YYFLAG -32768

% }

% union

{
 UINT64 value;
 UINT32 op;
 }

/*! [Begin] no source code translation */

%type <value> Expression

%token <op> EXPOP_EOF
 %token <op> EXPOP_NEW_LINE
 %token <op> EXPOP_NUMBER
 %token <op> EXPOP_HEX_NUMBER
 %token <op> EXPOP_DECIMAL_NUMBER
 %token <op> EXPOP_LABEL
 %token <op> EXPOP_PAREN_OPEN

```

%token <op>  EXPOP_PAREN_CLOSE

%left <op>  EXPOP_LOGICAL_OR
%left <op>  EXPOP_LOGICAL_AND
%left <op>  EXPOP_OR
%left <op>  EXPOP_XOR
%left <op>  EXPOP_AND
%left <op>  EXPOP_EQUAL EXPOP_NOT_EQUAL
%left <op>  EXPOP_GREATER EXPOP_LESS EXPOP_GREATER_EQUAL EXPOP_LESS_EQUAL
%left <op>  EXPOP_SHIFT_RIGHT EXPOP_SHIFT_LEFT
%left <op>  EXPOP_ADD EXPOP_SUBTRACT
%left <op>  EXPOP_MULTIPLY EXPOP_DIVIDE EXPOP_MODULO
%right <op>  EXPOP_ONES_COMPLIMENT EXPOP_LOGICAL_NOT

```

```
%%
```

```
/*
```

```
* Operator precedence rules (from K&R)
```

```
*
```

- * 1) ()
- * 2) ! ~ (unary operators that are supported here)
- * 3) * / %
- * 4) + -
- * 5) >> <<
- * 6) < > <= >=
- * 7) == !=
- * 8) &
- * 9) ^
- * 10) |
- * 11) &&
- * 12) ||

```
*/
```

```
Value
```

```

: Expression EXPOP_NEW_LINE      { DtParserResult=$1; return 0; } /* End of line (newline) */
| Expression EXPOP_EOF          { DtParserResult=$1; return 0; } /* End of string (0) */
;

```

```
Expression
```

```
/* Unary operators */
```

```

: EXPOP_LOGICAL_NOT      Expression      { $$ = DtDoOperator ($2, EXPOP_LOGICAL_NOT,  $2);}
| EXPOP_ONES_COMPLIMENT Expression      { $$ = DtDoOperator ($2,
EXPOP_ONES_COMPLIMENT, $2);}

```

```
/* Binary operators */
```

```

| Expression EXPOP_MULTIPLY Expression { $$ = DtDoOperator ($1, EXPOP_MULTIPLY,  $3);}

```

```

| Expression EXPOP_DIVIDE      Expression { $$ = DtDoOperator ($1, EXPOP_DIVIDE,      $3);}
| Expression EXPOP_MODULO     Expression { $$ = DtDoOperator ($1, EXPOP_MODULO,      $3);}
| Expression EXPOP_ADD        Expression { $$ = DtDoOperator ($1, EXPOP_ADD,          $3);}
| Expression EXPOP_SUBTRACT   Expression { $$ = DtDoOperator ($1, EXPOP_SUBTRACT,    $3);}
| Expression EXPOP_SHIFT_RIGHT Expression { $$ = DtDoOperator ($1, EXPOP_SHIFT_RIGHT, $3);}
| Expression EXPOP_SHIFT_LEFT Expression { $$ = DtDoOperator ($1, EXPOP_SHIFT_LEFT,  $3);}
| Expression EXPOP_GREATER    Expression { $$ = DtDoOperator ($1, EXPOP_GREATER,      $3);}
| Expression EXPOP_LESS       Expression { $$ = DtDoOperator ($1, EXPOP_LESS,         $3);}
| Expression EXPOP_GREATER_EQUAL Expression { $$ = DtDoOperator ($1,
EXPOP_GREATER_EQUAL, $3);}
| Expression EXPOP_LESS_EQUAL Expression { $$ = DtDoOperator ($1, EXPOP_LESS_EQUAL,
$3);}
| Expression EXPOP_EQUAL      Expression { $$ = DtDoOperator ($1, EXPOP_EQUAL,        $3);}
| Expression EXPOP_NOT_EQUAL  Expression { $$ = DtDoOperator ($1, EXPOP_NOT_EQUAL,    $3);}
| Expression EXPOP_AND        Expression { $$ = DtDoOperator ($1, EXPOP_AND,          $3);}
| Expression EXPOP_XOR        Expression { $$ = DtDoOperator ($1, EXPOP_XOR,          $3);}
| Expression EXPOP_OR         Expression { $$ = DtDoOperator ($1, EXPOP_OR,            $3);}
| Expression EXPOP_LOGICAL_AND Expression { $$ = DtDoOperator ($1, EXPOP_LOGICAL_AND,
$3);}
| Expression EXPOP_LOGICAL_OR Expression { $$ = DtDoOperator ($1, EXPOP_LOGICAL_OR,
$3);}

/* Parentheses: '(' Expression ')' */

| EXPOP_PAREN_OPEN      Expression
  EXPOP_PAREN_CLOSE      { $$ = $2;}

/* Label references (prefixed with $) */

| EXPOP_LABEL           { $$ = DtResolveLabel (DtParsertext);}

/* Default base for a non-prefixed integer is 16 */

| EXPOP_NUMBER          { UtStrtoul64 (DtParsertext, 16, &$$);}

/* Standard hex number (0x1234) */

| EXPOP_HEX_NUMBER      { UtStrtoul64 (DtParsertext, 16, &$$);}

/* TBD: Decimal number with prefix (0d1234) - Not supported by UtStrtoul64 at this time */

| EXPOP_DECIMAL_NUMBER  { UtStrtoul64 (DtParsertext, 10, &$$);}
;
%%

/*! [End] no source code translation !*/

```

```

/*
 * Local support functions, including parser entry point
 */
#define PR_FIRST_PARSE_OPCODE EXPOP_EOF
#define PR_YYTNAME_START      3

/*****
 *
 * FUNCTION: DtParsererror
 *
 * PARAMETERS: Message          - Parser-generated error message
 *
 * RETURN:    None
 *
 * DESCRIPTION: Handler for parser errors
 *
 *****/

void
DtParsererror (
    char const      *Message)
{
    DtError (ASL_ERROR, ASL_MSG_SYNTAX,
             Gbl_CurrentField, (char *) Message);
}

/*****
 *
 * FUNCTION: DtGetOpName
 *
 * PARAMETERS: ParseOpcode      - Parser token (EXPOP_*)
 *
 * RETURN:    Pointer to the opcode name
 *
 * DESCRIPTION: Get the ascii name of the parse opcode for debug output
 *
 *****/

char *
DtGetOpName (
    UINT32          ParseOpcode)
{
#ifdef ASL_YYTNAME_START
    /*
     * First entries (PR_YYTNAME_START) in yytname are special reserved names.
     * Ignore first 6 characters of name (EXPOP_)
     */

```

```

*/
return ((char *) yytname
        [(ParseOpcode - PR_FIRST_PARSE_OPCODE) + PR_YYTNAME_START] + 6);
#else
return ("[Unknown parser generator]");
#endif
}

/*****
*
* FUNCTION: DtEvaluateExpression
*
* PARAMETERS: ExprString      - Expression to be evaluated. Must be
*                          terminated by either a newline or a NUL
*                          string terminator
*
* RETURN:    64-bit value for the expression
*
* DESCRIPTION: Main entry point for the DT expression parser
*
*****/

UINT64
DtEvaluateExpression (
    char      *ExprString)
{
    DbgPrint (ASL_DEBUG_OUTPUT,
              "**** Input expression: %s (Base 16)\n", ExprString);

    /* Point lexer to the input string */

    if (DtInitLexer (ExprString))
    {
        DtError (ASL_ERROR, ASL_MSG_COMPILER_INTERNAL,
                 Gbl_CurrentField, "Could not initialize lexer");
        return (0);
    }

    /* Parse/Evaluate the input string (value returned in DtParserResult) */

    DtParserparse ();
    DtTerminateLexer ();

    DbgPrint (ASL_DEBUG_OUTPUT,
              "**** Parser returned value: %u (%.8X%.8X)\n",
              (UINT32) DtParserResult, ACPI_FORMAT_UINT64 (DtParserResult));
}

```



```
    return (DtParserResult);
}
```

Found in path(s):

```
*/opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/compiler/dtparser.y
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*

*****/

Found in path(s):

* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-
20120111/namespace/nseval.c

No license file was found, but licenses were detected in source scan.

/*

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*/

//

//

// Grammar.asl - Minimally exercises most ASL constructs

//

// NOTE -- use: iasl -f -of grammar.asl to compile

//

// This 1) Ignores errors (checks compiler error handling)

// 2) Disables constant folding

//

//

/*****

Compilation should look like this:

```
C:\acpica\tests\misc>iasl -f -of grammar.asl
```

```
Intel ACPI Component Architecture
ASL Optimizing Compiler version 20090422 [Apr 22 2009]
Copyright (C) 2000 - 2009 Intel Corporation
Supports ACPI Specification Revision 3.0a
```

```

grammar.asl 187: Name (_NPK, Package (8)
Warning 1098 -      ^ Unknown reserved name (_NPK)

grammar.asl 510: NAME (ESC1, "abcdefg\x00hijklmn")
Warning 1042 -      ^ Invalid Hex/Octal Escape - Non-ASCII or NULL

grammar.asl 511: NAME (ESC2, "abcdefg\000hijklmn")
Warning 1042 -      ^ Invalid Hex/Octal Escape - Non-ASCII or NULL

grammar.asl 601: Method (RCIV, 1)
Warning 1087 -      ^ Not all control paths return a value (RCIV)

grammar.asl 608: RCIV (Subtract (Arg0, 1))
Remark 5073 -      ^ Recursive method call (RCIV)

grammar.asl 937: Method (_ERR, 2)
Warning 1077 -      ^ Reserved method has too few arguments (_ERR requires 3)

grammar.asl 1377: Store (0x1234567887654321, QWD2)
Warning 1032 -      ^ 64-bit integer in 32-bit table, truncating

grammar.asl 1379: if (LNotEqual (Local0, 0x1234567887654321))
Warning 1032 -      64-bit integer in 32-bit table, truncating ^

grammar.asl 1459: SizeOf (BUFO)
Warning 1105 -      ^ Result is not used, operator has no effect

grammar.asl 1485: Acquire (MTX2, 1)
Warning 1104 -      ^ Possible operator timeout is ignored

grammar.asl 1633: Add (Local0, Local1)
Warning 1105 -      ^ Result is not used, operator has no effect

grammar.asl 1804: Method (COND)
Warning 1087 -      ^ Not all control paths return a value (COND)

grammar.asl 6010: Name (_HID, "*PNP0A06")
Error 4001 -      ^ String must be entirely alphanumeric (*PNP0A06)

grammar.asl 6461: Name (_CRS, Buffer(26) {"\_SB_.PCI2._CRS....."})
Warning 1038 -      Invalid or unknown escape sequence ^

grammar.asl 6800: And (Local0, 1, Local0) // Local0 &= 1
Error 4050 -      ^ Method local variable is not initialized (Local0)

grammar.asl 6886: Name (_HID, "*PNP0C0A") // Control Method Battery ID
Error 4001 -      ^ String must be entirely alphanumeric (*PNP0C0A)

```

ASL Input: grammar.asl - 10254 lines, 322162 bytes, 4810 keywords
AML Output: grammar.aml - 43392 bytes, 669 named objects, 4141 executable opcodes

Compilation complete. 3 Errors, 12 Warnings, 1 Remarks, 1101 Optimizations

```
*****  
*****/
```

```
DefinitionBlock (  
    "grammar.aml",    //Output filename  
    "DSDT",          //Signature  
    0x01,             //DSDT Revision ---> 32-bit table  
    "Intel",         //OEMID  
    "GRMTEST",       //TABLE ID  
    0x20090511       //OEM Revision  
)  
{
```

```
    External (\ABCD, UnknownObj)
```

```
    /* Device with _STA and _INI */
```

```
    Device (A1)  
    {  
        Method (_STA)  
        {  
            Return (0x0F)  
        }  
  
        Method (_INI)  
        {  
            Return  
        }  
    }
```

```
    /* Device with no _STA, has _INI */
```

```
    Device (A2)  
    {  
        Method (_INI)  
        {  
            Return  
        }  
    }
```

```
    /* Device with _STA, no _INI */
```



```

Device (A3)
{
    Method (_STA)
    {
        Return (0x0F)
    }
}

/* Device with _STA and _INI, but not present */

Device (A4)
{
    Method (_STA)
    {
        Return (Zero)
    }

    Method (_INI)
    {
        Return
    }
}

/* Resource descriptors */

Device (IRES)
{
    Name (PRT0, ResourceTemplate ())
    {
        IRQ (Edge, ActiveHigh, Exclusive) {3,4,5,6,7,9,10,11,14,15}

        StartDependentFn (1,1)
        {
            IRQNoFlags () {0,1,2}
        }
        EndDependentFn ()
    })

    Method (_CRS, 0, NotSerialized)
    {
        Store ("_CRS:", Debug)
        Store (PRT0, Debug)
        Return (PRT0)
    }

    Method (_SRS, 1, Serialized)

```

```
{
  Store ("_SRS:", Debug)
  Store (Arg0, Debug)
  Return (Zero)
}
```

Name (_NPK, Package ())

```
{
```

```
  0x1111,
```

```
  0x2222,
```

```
  0x3333,
```

```
  0x4444
```

```
})
```

Device (RES)

```
{
```

Name (_PRT, Package (0x04))

```
{
```

Package (0x04)

```
{
```

```
  0x0002FFFF,
```

```
  Zero,
```

```
  Zero,
```

```
  Zero
```

```
},
```

Package (0x04)

```
{
```

```
  0x0002FFFF,
```

```
  One,
```

```
  Zero,
```

```
  Zero
```

```
},
```

Package (0x04)

```
{
```

```
  0x000AFFFF,
```

```
  Zero,
```

```
  Zero,
```

```
  Zero
```

```
},
```

Package (0x04)

```
{
```

```
  0x000BFFFF,
```

```
  Zero,
```

```

    Zero,
    Zero
}
})

```

Method (_CRS, 0, NotSerialized)

```

{
    Name (PRT0, ResourceTemplate ()
    {
        WordBusNumber (ResourceConsumer, MinFixed, MaxFixed, SubDecode,
            0x0000, // Address Space Granularity
            0xFFF2, // Address Range Minimum
            0xFFF3, // Address Range Maximum
            0x0032, // Address Translation Offset
            0x0002,,,)
        WordBusNumber (ResourceProducer, MinFixed, MaxFixed, PosDecode,
            0x0000, // Address Space Granularity
            0x0000, // Address Range Minimum
            0x00FF, // Address Range Maximum
            0x0000, // Address Translation Offset
            0x0100,,,)
        WordSpace (0xC3, ResourceConsumer, PosDecode, MinFixed, MaxFixed, 0xA5,
            0x0000, // Address Space Granularity
            0xA000, // Address Range Minimum
            0xBFFF, // Address Range Maximum
            0x0000, // Address Translation Offset
            0x2000,,,)
        IO (Decode16, 0x0CF8, 0x0CFF, 0x01, 0x08)
        WordIO (ResourceProducer, MinFixed, MaxFixed, PosDecode, EntireRange,
            0x0000, // Address Space Granularity
            0x0000, // Address Range Minimum
            0x0CF7, // Address Range Maximum
            0x0000, // Address Translation Offset
            0x0CF8,,)
        , TypeStatic)
        WordIO (ResourceProducer, MinFixed, MaxFixed, PosDecode, EntireRange,
            0x0000, // Address Space Granularity
            0x0D00, // Address Range Minimum
            0xFFFF, // Address Range Maximum
            0x0000, // Address Translation Offset
            0xF300,,)
        , TypeStatic)
        DWordIO (ResourceProducer, MinFixed, MaxFixed, PosDecode, EntireRange,
            0x00000000, // Address Space Granularity
            0x00000000, // Address Range Minimum
            0x0000CF7, // Address Range Maximum
            0x00000000, // Address Translation Offset
            0x0000CF8,,)
    }
}

```

```

, TypeStatic)
DWordMemory (ResourceProducer, PosDecode, MinFixed, MaxFixed, Cacheable, ReadWrite,
0x00000000, // Address Space Granularity
0x000C8000, // Address Range Minimum
0x000EFFFF, // Address Range Maximum
0x00000000, // Address Translation Offset
0x00028000,,
, AddressRangeMemory, TypeStatic)
DWordSpace (0xC3, ResourceConsumer, PosDecode, MinFixed, MaxFixed, 0xA5,
0x00000000, // Address Space Granularity
0x000C8000, // Address Range Minimum
0x000EFFFF, // Address Range Maximum
0x00000000, // Address Translation Offset
0x00028000,,)
QWordIO (ResourceProducer, MinFixed, MaxFixed, PosDecode, EntireRange,
0x0000000000000000, // Address Space Granularity
0x0000000000000000, // Address Range Minimum
0x000000000000CF7, // Address Range Maximum
0x0000000000000000, // Address Translation Offset
0x000000000000CF8, 0x44, "This is a ResourceSource string",
, TypeStatic)
QWordIO (ResourceProducer, MinFixed, MaxFixed, PosDecode, EntireRange,
0x0000000000000000, // Address Space Granularity
0x0000000000000000, // Address Range Minimum
0x000000000000CF7, // Address Range Maximum
0x0000000000000000, // Address Translation Offset
0x000000000000CF8,,
, TypeStatic)
QWordMemory (ResourceProducer, PosDecode, MinFixed, MaxFixed, Cacheable, ReadWrite,
0x0000000000000000, // Address Space Granularity
0x000000000100000, // Address Range Minimum
0x00000000FFDFFFFFFF, // Address Range Maximum
0x0000000000000000, // Address Translation Offset
0x00000000FFD00000,,
, AddressRangeMemory, TypeStatic)
QWordSpace (0xC3, ResourceConsumer, PosDecode, MinFixed, MaxFixed, 0xA5,
0x0000000000000000, // Address Space Granularity
0x0000000000000000, // Address Range Minimum
0x000000000000CF7, // Address Range Maximum
0x0000000000000000, // Address Translation Offset
0x000000000000CF8,,)
ExtendedIO (ResourceProducer, MinFixed, MaxFixed, PosDecode, EntireRange,
0x0000000000000000, // Address Space Granularity
0x0000000000000000, // Address Range Minimum
0x000000000000CF7, // Address Range Maximum
0x0000000000000000, // Address Translation Offset
0x000000000000CF8, // Address Length
0x0000000000000000, // Type Specific Attributes

```

```

, TypeStatic)
ExtendedMemory (ResourceProducer, PosDecode, MinFixed, MaxFixed, Cacheable, ReadWrite,
    0x0000000000000000, // Address Space Granularity
    0x0000000000100000, // Address Range Minimum
    0x00000000FFDFFFFFFF, // Address Range Maximum
    0x0000000000000000, // Address Translation Offset
    0x00000000FFD00000, // Address Length
    0x0000000000000000, // Type Specific Attributes
, AddressRangeMemory, TypeStatic)
ExtendedSpace (0xC3, ResourceProducer, PosDecode, MinFixed, MaxFixed, 0xA3,
    0x0000000000000000, // Address Space Granularity
    0x0000000000100000, // Address Range Minimum
    0x00000000FFDFFFFFFF, // Address Range Maximum
    0x0000000000000000, // Address Translation Offset
    0x00000000FFD00000, // Address Length
    0x0000000000000000) // Type Specific Attributes
IO (Decode16, 0x0010, 0x0020, 0x01, 0x10)
IO (Decode16, 0x0090, 0x00A0, 0x01, 0x10)
FixedIO (0x0061, 0x01)
IRQNoFlags () {2}
DMA (Compatibility, BusMaster, Transfer8_16) {4}
DMA (Compatibility, BusMaster, Transfer8) {2,5,7}
Memory32Fixed (ReadWrite, 0x00100000, 0x00000000)
Memory32Fixed (ReadOnly, 0xFFFFE000, 0x00020000)
Memory32 (ReadOnly, 0x00020000, 0xFFFFE000, 0x00000004, 0x00000200)
Memory24 (ReadOnly, 0x1111, 0x2222, 0x0004, 0x0200)
Interrupt (ResourceConsumer, Level, ActiveLow, Exclusive, 0xE, "\\_SB_.TEST")
{
    0x00000E01,
}
Interrupt (ResourceConsumer, Edge, ActiveHigh, Exclusive, 0x6, "xxxx")
{
    0x00000601,
    0x00000003,
    0x00000002,
    0x00000001,
}
Interrupt (ResourceProducer, Edge, ActiveHigh, Exclusive)
{
    0xFFFF0000,
    0x00000003,
    0x00000002,
    0x00000001,
    0x00000005,
    0x00000007,
    0x00000009,
}
VendorShort () {0x01, 0x02, 0x03}

```

```

VendorLong ()
{
    0x01, 0x02, 0x03, 0x04, 0x05, 0x06, 0x07, 0x08,
    0x09
}
Register (SystemIO, 0x08, 0x00, 0x00000000000000B2, , R000)
Register (SystemMemory, 0x08, 0x00, 0x00000000000000B2)
StartDependentFnNoPri ()
{
    IRQNoFlags () {0,1,2}
    IRQ (Level, ActiveLow, Shared) {3,4,5,6,7,9,10,11,14,15}
}
EndDependentFn ()
})
CreateWordField (PRT0, 0x08, BMIN)
CreateByteField (PRT0, R000._ASZ, RSIZ)
Store (0x03, BMIN)
Return (PRT0)
}

```

```

Method (_PRS, 0, NotSerialized)
{
    Name (BUF0, ResourceTemplate ()
    {
        StartDependentFn (0x01, 0x02)
        {
            IO (Decode16, 0x03D8, 0x03F8, 0x01, 0x08)
            IRQNoFlags () {4}
        }
        StartDependentFn (0x02, 0x01)
        {
            IO (Decode16, 0x03D8, 0x03E8, 0x01, 0x08)
            IRQNoFlags () {4}
        }
        StartDependentFn (0x00, 0x02)
        {
            IO (Decode16, 0x02E8, 0x02F8, 0x01, 0x08)
            IRQNoFlags () {3}
        }
        StartDependentFn (0x00, 0x02)
        {
            IO (Decode16, 0x02D8, 0x02E8, 0x01, 0x08)
            IRQNoFlags () {3}
        }
        StartDependentFn (0x02, 0x00)
        {
            IO (Decode16, 0x0100, 0x03F8, 0x08, 0x08)
            IRQNoFlags () {1,3,4,5,6,7,8,10,11,12,13,14,15}
        }
    }
}

```

```

    }
    EndDependentFn ()
  })
  Return (BUF0)
}

Method (_SRS, 1, Serialized)
{
  Return (Zero)
}
}

Name(\_S0,Package(0x04){
  0x00,
  0x00,
  0x00,
  0x00
})
Name(\_S3,Package(0x04){
  0x05,
  0x05,
  0x00,
  0x00
})
Name(\_S4,Package(0x04){
  0x06,
  0x06,
  0x00,
  0x00
})
Name(\_S5,Package(0x04){
  0x07,
  0x07,
  0x00,
  0x00
})
})

/* Examine this table header (DSDT) */

/*
DataTableRegion (HDR, "DSDT", "", "")
Field (HDR, AnyAcc, NoLock, Preserve)
{
  SIG, 32,
  LENG, 32,
  REV, 8,
  SUM, 8,

```

```

    OID, 48,
    OTID, 64,
    OREV, 32,
    CID, 32,
    CREV, 32
}

Method (SIZE)
{
    If (LLess (REV, 2))
    {
        Store ("32-bit table", Debug)
    }
    else
    {
        Store ("64-bit table", Debug)
    }
    Return (0)
}

*/
Name (SIZE, 0)

/* Custom operation region */

OperationRegion(MYOP,0x80,0xFD60,0x6)
Field(MYOP,ByteAcc,NoLock,Preserve)
{
    MFLD,8
}

Method (TCOP)
{
    Name (_STR, Unicode ("test"))
    Store (4, MFLD)
    Store (MFLD, Local0)
}

Name (ERRS, 0x0)

/* Warning should be issued for premature string termination */

NAME (ESC1, "abcdefg\x00hijklmn")
NAME (ESC2, "abcdefg\000hijklmn")
Name (ESC3, "abc\a\bdef\f\n\r\t\v\x03ffff\432")

Name(CRSA,ResourceTemplate())

```



```

{
WORDBusNumber(ResourceProducer,MinFixed,MaxFixed,PosDecode,0x0000,0x0019,0x001D,0x0000,0x0005)
WORDIO(ResourceProducer,MinFixed,MaxFixed,PosDecode,NonISAOnlyRanges,0x0000,0xC000,0xCFFF,0x000
0,0x1000)
DWORDMemory(ResourceProducer,PosDecode,MinFixed,MaxFixed,NonCacheable,ReadWrite,0x00000000,0xD8
000000,0xDBFFFFFF,0x00000000,0x04000000)

})
Name(CRSB,ResourceTemplate()
{
DWORDMemory(ResourceProducer,PosDecode,MinFixed,MaxFixed,NonCacheable,ReadWrite,0x00000000,0xD8
000000,0xDBFFFFFF,0x00000000,0x04000000)

})

Name(CRSC,ResourceTemplate()
{
VendorShort () {0x1, 0x2, 0x3}
})
Name(CRSD,ResourceTemplate()
{
VendorLong (VNDL) {0x1, 0x2, 0x3, 0x4, 0x5, 0x6, 0x7, 0x8, 0x9}
})

Name(CRSE,ResourceTemplate()
{
IRQNoFlags(){3,4,10,11}
IRQNoFlags(xxxt){3,4,10,11}
})
Name(CRSR, Buffer (Add (SizeOf(CRSA),SizeOf(CRSB)))){ })
Method(_CRS,0,NotSerialized)
{
Return(CRSR)
}

//
// Unnamed scope
//
Scope (\)
{
Name(Bxxx,0xFFFFFFFF)
}

Name (LANS, 0x0)

PowerResource(LANP,1,0)
{

```

```

Method(_STA){
    If(LEqual(And(LANS,0x30),0x30)){
        Return(One)
    } Else {
        Return(Zero)
    }
}
Method(_ON){
    If(LNot(_STA())){
        Store (0x30, LANS)
    }
}
Method(_OFF){
    If(_STA()){
        Store (0, LANS)
    }
}
}

```

/* Can a method define another method? */

/******

Method (TASK, 2, SERIALIZED)

```

{
    Sleep (100)

```

Method (TAS2)

```

{
    Sleep (100)
}

```

TAS2()

Return

```

}

```

/* A recursive method */

Method (RCIV, 1)

```

{
    Store (Arg0, Debug)
    If (Lequal (Arg0, 0))
    {
        Return ()
    }
    RCIV (Subtract (Arg0, 1))

```

```
}
```

```
Method (RTOP)
```

```
{
```

```
    RCIV (100)
```

```
}
```

```
Scope(\_PR)
```

```
{
```

```
    Processor(CPU0,0x0,0xFFFFFFFF,0x0) { }
```

```
}
```

```
Name(B1TP,0xFFFFFFFF)
```

```
Name(B2TP,0xFFFFFFFF)
```

```
Name(ADPS,0xFFFFFFFF)
```

```
Name(B1PS,0xFFFFFFFF)
```

```
Name(B1RS,0xFFFFFFFF)
```

```
Name(B1CS,0xFFFFFFFF)
```

```
Name(B2PS,0xFFFFFFFF)
```

```
Name(B2RS,0xFFFFFFFF)
```

```
Name(B2CS,0xFFFFFFFF)
```

```
Name(B1DC,3000)
```

```
Name(B2DC,2600)
```

```
Name(B1LF,3000)
```

```
Name(B2LF,2600)
```

```
Name(BPIF,0)
```

```
Name(PBLL,0)
```

```
Name(RBIF,Package())
```

```
{
```

```
    0x1,
```

```
    2200,
```

```
    2200,
```

```
    0x1,
```

```
    10800,
```

```
    0,
```

```
    0,
```

```
    1,
```

```
    1,
```

```
    "CA54200-5003/5",
```

```
    "1",
```

```
    "LION",
```

```
    "Fujitsu"
```

```
})
```

```
Method(SMWE, 4)
```

```

{
    return(ONES)
}

Method(SMRE, 4)
{
    return(ONES)
}

/*
Method(RDBT,0,Serialized){
    If(LNot(SMWE(0x09,0x15,1,1))){
        Store(0x18,Local2)
    }
}
*/
Scope(_SB)
{

    Name (SBUF, Buffer (128) {})

    CreateBitField (SBUF, 3, BITY)
    CreateByteField (SBUF, 1, BYTY)
    CreateWordField (SBUF, 2, WRDZ)
    CreateDwordField (SBUF, 4, DWDZ)
    CreateQwordField (SBUF, 8, QWDZ)
    CreateField (SBUF, 128, 12, FLDZ)
    CreateField (SBUF, 148, 96, FLDY)
    CreateField (SBUF, 148, 96, _SB_.FLDW)

    Method (_INI)
    {
        CreateField (_SB_.SBUF, 148, 96, FLDV)
    }

    Device(PCI0)
    {
        Name(_HID,EISAID("PNP0A03"))
        Name(_ADR,0x0)

        Method(_CRS)
        {
            Name(PRT0, ResourceTemplate() {
                WORDBusNumber(           // Bus number resource(0)
                    ResourceConsumer,    // bit 0 of general flags is 1
                    MinFixed,            // Range is notfixed
                    MaxFixed,            // Range is not fixed
            )
        }
    }
}

```

```

        SubDecode,          // SubDecode
        0x0000,            // Granularity
        0xfff1,            // Min
        0xfff2,            // Max
        0x0032,            // Translation
        0x0002,,,         // Range Length
        BUS0
    ) } // PRT0

CreateWordField(PRT0, BUS0._MIN, BMIN) //Minimum bus number suported under this bridge.

Store(3, BMIN)
Return(PRT0)

} // _CRS

Method(_SRS)
{
    Return ()
}

Device(EIO)
{
    OperationRegion(FJIO,SystemIO,0xFD60,0x6)
    Field(FJIO,ByteAcc,NoLock,Preserve)
    {
        GIDX,8,

        GDTA,8,

        PIDX,8,

        PDTA,8,

        SIDX,8,

        SDTA,8
    }
    IndexField(GIDX,GDTA,ByteAcc,NoLock,Preserve)
    {
        Offset(0x2),
        ,5,
        VGAS,2,
        Offset(0x4),
        ,4,
        DCKE,1,
        Offset(0x5),
        ,6,
    }
}

```

```
    ACPW,1,

    Offset(0xA),
    B1P,1,

    B2P,1,

    B1C,1,

    B2C,1,

    B1ER,1,

    B2ER,1,

    Offset(0xB),
    B1CP,8,

    B2CP,8,

    BCP,8,

    B1VH,8,

    B1VL,8,

    B2VH,8,

    B2VL,8,

    B1TM,8,

    B2TM,8,

    B1CH,8,

    B1CL,8,

    B2CH,8,

    B2CL,8
  }
}
}
}

Method(RDBT,3,Serialized){
  Store(0x1FFF,Local1)
```

```

If( Arg0 ){
    Store(0x2FFF,Local1)
}
Store(0x18,Local2)
If( Arg1 ){
    Store(0x10,Local2)
}
If(LNot(SMRE(0x09,0x15,1,RefOf(Local0)))){
    If(LNot(SMWE(0x08,0x14,1,Local1))){
        If(LNot(SMRE(0x09,0x17,Local2,RefOf(Local3)))){
            Store(Local1,Arg2)
        }
    }
    Or(Local0,0xFFF,Local0)
    SMWE(0x08,0x14,1,Local0)
}
}
Method(MKWD,2)
{
    If(And(Arg1,0x80)) {
        Or(0xFFFF0000,Arg0,Local0)
        Or(Local0,ShiftLeft(Arg1,8),Local0)
        Subtract(Zero,Local0,Local0)
    } else {
        Store(Arg0,Local0)
        Or(Local0,ShiftLeft(Arg1,8),Local0)
    }
    Return(Local0)
}

```

```

Device(CMB1)
{
    Name(_HID,EISAID("PNP0C0A"))
    Name(_UID,0x1)
    Alias(\_SB.PCI0.EIO.B1P,\_SB_.PCI0.XXXX)
    Alias(\_SB.PCI0.EIO.B1P,B1P)
    Alias(\_SB.PCI0.EIO.B1C,B1C)
    Alias(\_SB.PCI0.EIO.B1CH,B1CH)
    Alias(\_SB.PCI0.EIO.B1CL,B1CL)
    Alias(\_SB.PCI0.EIO.B1VH,B1VH)
    Alias(\_SB.PCI0.EIO.B1VL,B1VL)
    Alias(\_SB.PCI0.EIO.B1CP,B1CP)

    Method(_INI)
    {
        Store(B1P, B1PS)
        Store(B1CP,B1RS)
        Store(B1C, B1CS)
    }
}

```

```

}

Method(_BIF){
  RDBT(Zero,Zero,RefOf(B1DC))
  RDBT(Zero,One,RefOf(B1LF))
  Store(B1DC,Index(RBIF,1))
  Store(B1LF,Index(RBIF,2))
  Store("CA54200-5003/5",Index(RBIF,9))
  Store("1",Index(RBIF,10))
  Return(RBIF)
}

Method(_BST) {

  _INI()

  Store(Zero,Local0)

  if (LAnd(B1P,LNot(B1C))){
    Or(Local0,1,Local0)
  }

  if (LAnd(B1P,B1C)) {
    Or(Local0,2,Local0)
  }

  if (LLessEqual(B1CP,1)) {
    Or(Local0,4,Local0)
  }

  Store(MKWD(B1CL,B1CH),Local1)

  Store(Divide(Add(Multiply(B1CP,B1LF),99),100),Local2)

  Store(MKWD(B1VL,B1VH),Local3)

  Name(STAT,Package(4){})
  Store(Local0,Index(STAT,0))
  Store(Local1,Index(STAT,1))
  Store(Local2,Index(STAT,2))
  Store(Local3,Index(STAT,3))

  If(LNot(BPIF)){
//      \_SB.PCI0.EIO.EC0.IECT()
//      \_SB.PCI0.EIO.EC0.SECT()
    Store(One,BPIF)
  }
  return(STAT)
}

```



```

    }

}

Device (DEV1)
{
}

Scope(\_TZ)
{
    ThermalZone(TZ1)
    {
        Name(_PSL,Package()
        {
            \_PR.CPU0
        })
    }
}

Method (TZ2, 0, SERIALIZED)
{
    Name(_PSL,Package()
    {
        \_PR.CPU0
    })

    Return (_PSL)
}

ThermalZone (THM1)
{
}

Method (NOTI)
{
    Notify (\DEV1, 0)
    Notify (\THM1, 0)
    Notify (\_PR.CPU0, 0)
}

Method (_ERR, 2)
{
    Increment (ERRS)
    Store ("Run-time exception:", Debug)
    Store (Arg0, Debug)
    Store (Arg1, Debug)

    Return (0)    // Map error to AE_OK
}

```

```
}
```

Method (DIV0)

```
{  
  Store (1, Local0)  
  Store (0, Local1)  
  Divide (Local0, Local1, Local3)  
  
  Store ("DIV0 - noabort", Debug)  
}
```

Method (ERR_, 1)

```
{  
  if (LEqual (Arg0, 0))  
  {  
    Store ("++++ MTHD_ERROR: Results not equal!", Debug)  
  }  
  if (LEqual (Arg0, 1))  
  {  
    Store ("++++ MTHD_ERROR: Numeric result is incorrect!", Debug)  
  }  
  if (LEqual (Arg0, 2))  
  {  
    Store ("++++ MTHD_ERROR: Operand was clobbered!", Debug)  
  }  
  
  Notify (DEV1, Arg0)  
  Increment (ERRS)  
}
```

Method (R226, 2)

```
{  
}
```

Method (R225, 2)

```
{  
  R226 (Arg0, Arg1)  
}
```

Method (R224, 2)

```
{  
  R225 (Arg1, Arg0)  
}
```

Method (R223, 2)

```
{  
  R224 (Arg0, Arg1)  
}
```

Method (R222, 2)

```
{  
  R223 (Arg1, Arg0)
```

```

}
Method (R111)
{
    Store (0x01010101, Local0)
    R222 (0xABAB, Local0)
    Store (Local0, Local1)
}

Method (MAIN)
{

//    SIZE()
    Store (NUM1(), Local0)
    \CMB1._BST()
    RDBT(1,2,3)
    OBJ1(1)
    OBJ2(2)
    CHEK()
    RETZ()
    BITZ()
    LOGS()
    REFS()
    COND()
    TZ2()

//
// iPCO tests added
//
    Store (\IFEL.TEST(), Local0)
    if (LGreater (Local0, 0))
    {
        ERR_ (1)
        Return(Local0)
    }

    Store (\NOSV.TEST(), Local0)
    if (LGreater (Local0, 0))
    {
        ERR_ (1)
        Return(Local0)
    }

    Store (\IDXF.TEST(), Local0)
    if (LGreater (Local0, 0))
    {
        ERR_ (1)
        Return(Local0)
    }
}

```

```
Store (\_SB\_NSTL.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
Store (\RTBF.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
Store (\_SB\_RTL.V.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
Store (\_SB\_RETP.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
Store (\WHLR.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
Store (\AND0.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
Store (\BRKP.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}
```

```
}  
  
Store (\ADSU.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)  
    Return(Local0)  
}
```

```
Store (\INDC.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)  
    Return(Local0)  
}
```

```
Store (\LOPS.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)  
    Return(Local0)  
}
```

```
Store (\FDSO.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)  
    Return(Local0)  
}
```

```
Store (\MLDV.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)  
    Return(Local0)  
}
```

```
Store (\NBIT.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)  
    Return(Local0)  
}
```

```
Store (\SHFT.TEST(), Local0)  
if (LGreater (Local0, 0))  
{  
    ERR_ (1)
```

```
    Return(Local0)
}

Store (\XORD.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\CRBF.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\IDX4.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\EVNT.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\SZLV.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\_SB_.BYTF.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\DWDF.TEST(), Local0)
if (LGreater (Local0, 0))
{
```

```

    ERR_ (1)
    Return(Local0)
}

Store (\DVAX.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\IDX6.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\IDX5.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\_SB_.IDX0.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\_SB_.IDX3.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\IDX7.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\MTCH.TEST(), Local0)
if (LGreater (Local0, 0))

```

```

{
    ERR_ (1)
    Return(Local0)
}

Store (\WHLB.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\_SB_.IDX2.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\SIZO.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

Store (\_SB_.SMIS.TEST(), Local0)
if (LGreater (Local0, 0))
{
    ERR_ (1)
    Return(Local0)
}

if (LGreater (ERRS, 0))
{
    Store ("***** There were errors during the execution of the test *****", Debug)
}

//
// Last Test
//

Return(0) // Success
}

Method (OBJ1, 1, SERIALIZED)
{

```



```

Store (3, Local0)
Name(BUFR, Buffer (Local0) { })
Name(BUF1, Buffer (4) { 1,2,3,4})
Name(BUF2, Buffer (4) { })

Store (BUF1, BUF2)
Mutex (MTX1, 4)

Alias (MTX1, MTX2)
}

Mutex (MTXT, 0)
Mutex (MTXX, 0)

/*
 * Field Creation
 */

Method (FLDS)
{
    Store ("+++++++ Creating BufferFields", Debug)
    Name (BUF2, Buffer (128) { })

    CreateBitField (BUF2, 3, BIT2)
    CreateByteField (BUF2, 1, BYT2)
    CreateWordField (BUF2, 2, WRD2)
    CreateDwordField (BUF2, 4, DWD2)
    CreateQwordField (BUF2, 8, QWD2)
    CreateField (BUF2, 128, 12, FLD2)
    CreateField (BUF2, 148, 96, FLD3)

    Store (0x1, BIT2)
    Store (BIT2, Local0)
    if (LNotEqual (Local0, 0x1))
    {
        ERR_ (1)
    }
    else
    {
        Store (DerefOf (Index (BUF2, 0)), Local0)
        if (LNotEqual (Local0, 0x08))
        {
            ERR_ (1)
        }
        else
        {

```

```

    Store ("+++++++ Bit BufferField I/O PASS", Debug)
  }
}

Store (0x1A, BYT2)
Store (BYT2, Local0)
if (LNotEqual (Local0, 0x1A))
{
  ERR_ (1)
}
else
{
  Store ("+++++++ Byte BufferField I/O PASS", Debug)
}

Store (0x1234, WRD2)
Store (WRD2, Local0)
if (LNotEqual (Local0, 0x1234))
{
  ERR_ (1)
}
else
{
  Store ("+++++++ Word BufferField I/O PASS", Debug)
}

Store (0x123, FLD2)
Store (FLD2, Local0)
if (LNotEqual (Local0, 0x123))
{
  ERR_ (1)
}
else
{
  Store ("+++++++ 12-bit BufferField I/O PASS", Debug)
}

Store (0x12345678, DWD2)
Store (DWD2, Local0)
if (LNotEqual (Local0, 0x12345678))
{
  ERR_ (1)
}
else
{
  Store ("+++++++ Dword BufferField I/O PASS", Debug)
}

```

```

Store (0x1234567887654321, QWD2)
Store (QWD2, Local0)
if (LNotEqual (Local0, 0x1234567887654321))
{
    ERR_ (1)
}
else
{
    Store ("+++++++ Qword BufferField I/O PASS", Debug)
}
}

/* Field execution */

Method (FLDX)
{
    Field (\_SB\_MEM.SMEM, AnyAcc, NoLock, Preserve)
    { // Field: SMEM overlay using 32-bit field elements
        SMD0, 32, // 32-bits
        SMD1, 32, // 32-bits
        SMD2, 32, // 32-bits
        SMD3, 32 // 32-bits
    } // Field: SMEM overlay using 32-bit field elements
    Field (\_SB\_MEM.SMEM, AnyAcc, NoLock, Preserve)
    { // Field: SMEM overlay using greater than 32-bit field elements
        SME0, 69, // larger than an integer (32 or 64)
        SME1, 97 // larger than an integer
    } // Field: SMEM overlay using greater than 32-bit field elements
}

Method (MTX_, )
{
    /* Test "Force release" of mutex on method exit */

    Acquire (MTXT, 0xFFFF)
    Acquire (MTXX, 0xFFFF)

    Store ("+++++++ Acquiring Mutex MTX2", Debug)
    Acquire (_GL_, 0xFFFF)

    Store ("+++++++ Releasing Mutex MTX2", Debug)
    Release (_GL_)
}

```

```

Method (OBJ2, 1)
{
    Store ("+++++++ Creating Buffer BUFO", Debug)
    Name (BUFO, Buffer (32) {})

    Store ("+++++++ Creating OpRegion OPR2", Debug)
    OperationRegion (OPR2, SystemMemory, Arg0, 256)

    Store ("+++++++ Creating Field(s) in OpRegion OPR2", Debug)
    Field (OPR2, ByteAcc, NoLock, Preserve)
    {
        IDX2, 8,
        DAT2, 8,
        BNK2, 4
    }

    Store ("+++++++ Creating BankField BNK2 in OpRegion OPR2", Debug)
    //
    // mcw 3/20/00 - changed FET0, 4, FET1, 3 to FET0, 1, FET1, 1
    //
    BankField (OPR2, BNK2, 0, ByteAcc, NoLock, Preserve)
    {
        FET0, 4,
        FET1, 3
    }

    Store ("+++++++ Creating IndexField", Debug)
    IndexField (IDX2, DAT2, ByteAcc, NoLock, Preserve)
    {
        FET2, 4,
        FET3, 3
    }

    Store ("+++++++ SizeOf (BUFO)", Debug)
    SizeOf (BUFO)

    Store ("+++++++ Store (SizeOf (BUFO), Local0)", Debug)
    Store (SizeOf (BUFO), Local0)

    Store ("+++++++ Concatenate (\"abd\", \"def\", Local0)", Debug)
    Concatenate ("abd", "def", Local0)
    Store (Local0, Debug)

    Store ("+++++++ Concatenate (\"abd\", 0x7B, Local0)", Debug)
    Concatenate ("abd", 0x7B, Local0)
    Store (Local0, Debug)

    Store ("+++++++ Creating Event EVT2", Debug)

```

```

Event (EVT2)

Store ("+++++++ Creating Mutex MTX2", Debug)
Mutex (MTX2, 0)

Store ("+++++++ Creating Alias MTXA to MTX2", Debug)
Alias (MTX2, MTXA)

Store ("+++++++ Acquiring Mutex MTX2", Debug)
Acquire (MTX2, 0xFFFF)

Store ("+++++++ Acquiring Mutex MTX2 (2nd acquire)", Debug)
Acquire (MTX2, 1)

Store ("+++++++ Releasing Mutex MTX2", Debug)
Release (MTX2)

// Type 1 opcodes

Store ("+++++++ Signalling Event EVT2", Debug)
Signal (EVT2)

Store ("+++++++ Resetting Event EVT2", Debug)
Reset (EVT2)

Store ("+++++++ Signalling Event EVT2", Debug)
Signal (EVT2)

Store ("+++++++ Waiting Event EVT2", Debug)
Wait (EVT2, 0xFFFF)

Store ("+++++++ Sleep", Debug)
Sleep (100)

Store ("+++++++ Stall", Debug)
Stall (254)

Store ("+++++++ NoOperation", Debug)
Noop

// Type 2 Opcodes

Store ("+++++++ Return from Method OBJ2", Debug)
return (4)
}

Method (NUM1, 0)

```

```

{
/* ADD */

Store ("+++++++ Add (0x12345678, 0x11111111, Local0)", Debug)
Add (0x12345678, 0x11111111, Local0)

Store ("+++++++ Store (Add (0x12345678, 0x11111111), Local1)", Debug)
Store (Add (0x12345678, 0x11111111), Local1)

Store ("+++++++ Checking result from ADD", Debug)
if (LNotEqual (Local0, Local1))
{
ERR_ (0)
}

/* SUBTRACT */

Store ("+++++++ Subtract (0x87654321, 0x11111111, Local4)", Debug)
Subtract (0x87654321, 0x11111111, Local4)

Store ("+++++++ Store (Subtract (0x87654321, 0x11111111), Local5)", Debug)
Store (Subtract (0x87654321, 0x11111111), Local5)

Store ("+++++++ Checking result from SUBTRACT", Debug)
if (LNotEqual (Local4, Local5))
{
ERR_ (0)
}

/* MULTIPLY */

Store ("+++++++ Multiply (33, 10, Local6)", Debug)
Multiply (33, 10, Local6)

Store ("+++++++ Store (Multiply (33, 10), Local7)", Debug)
Store (Multiply (33, 10), Local7)

Store ("+++++++ Checking result from MULTIPLY", Debug)
if (LNotEqual (Local6, Local7))
{
ERR_ (0)
}

/* DIVIDE */

```

```

Store ("+++++++ Divide (100, 9, Local1, Local2)", Debug)
Divide (100, 9, Local1, Local2)

Store ("+++++++ Store (Divide (100, 9), Local3)", Debug)
Store (Divide (100, 9), Local3)

Store ("+++++++ Checking (quotient) result from DIVIDE", Debug)
if (LNotEqual (Local2, Local3))
{
    ERR_ (0)
}

/* INCREMENT */

Store ("+++++++ Increment (Local0)", Debug)
Store (1, Local0)
Store (2, Local1)
Increment (Local0)

Store ("+++++++ Checking result from INCREMENT", Debug)
if (LNotEqual (Local0, Local1))
{
    ERR_ (0)
}

/* DECREMENT */

Store ("+++++++ Decrement (Local0)", Debug)
Store (2, Local0)
Store (1, Local1)
Decrement (Local0)

Store ("+++++++ Checking result from DECREMENT", Debug)
if (LNotEqual (Local0, Local1))
{
    ERR_ (0)
}

/* TOBCD */
/* FROMBCD */

Store ("+++++++ ToBCD (0x1234, Local5)", Debug)
ToBCD (0x1234, Local5)

```

Store ("+++++++ FromBCD (Local5, Local6)", Debug)

FromBCD (Local5, Local6)

Store ("+++++++ Return (Local6)", Debug)

Return (Local6)

}

Method (CHEK)

{

Store (3, Local0)

Store (3, Debug)

Store (Local0, Debug)

Store (7, Local1)

Add (Local0, Local1)

if (LNotEqual (Local0, 3))

{

ERR_ (2)

}

if (LNotEqual (Local1, 7))

{

ERR_ (2)

}

Add (Local0, Local1, Local2)

if (LNotEqual (Local0, 3))

{

ERR_ (2)

}

if (LNotEqual (Local1, 7))

{

ERR_ (2)

}

}

Method (RET1)

{

Store (3, Local0)

Return (Local0)

}

Method (RET2)

{

Return (RET1())


```
}
```

Method (RETZ)

```
{  
  RET2 ()  
}
```

Method (BITZ)

```
{  
  Store ("+++++++ FindSetLeftBit (0x00100100, Local0)", Debug)  
  FindSetLeftBit (0x00100100, Local0)  
  if (LNotEqual (Local0, 21))  
  {  
    ERR_ (1)  
  }  
  
  Store ("+++++++ FindSetRightBit (0x00100100, Local1)", Debug)  
  FindSetRightBit (0x00100100, Local1)  
  if (LNotEqual (Local1, 9))  
  {  
    ERR_ (1)  
  }  
  
  Store ("+++++++ And (0xF0F0F0F0, 0x11111111, Local2)", Debug)  
  And (0xF0F0F0F0, 0x11111111, Local2)  
  if (LNotEqual (Local2, 0x10101010))  
  {  
    ERR_ (1)  
  }  
  
  Store ("+++++++ NAnd (0xF0F0F0F0, 0x11111111, Local3)", Debug)  
  NAnd (0xF0F0F0F0, 0x11111111, Local3)  
  if (LNotEqual (Local3, 0xEFEFEFEF))  
  {  
    ERR_ (1)  
  }  
  
  Store ("+++++++ Or (0x11111111, 0x22222222, Local4)", Debug)  
  Or (0x11111111, 0x22222222, Local4)  
  if (LNotEqual (Local4, 0x33333333))  
  {  
    ERR_ (1)  
  }  
  
  Store ("+++++++ NOr (0x11111111, 0x22222222, Local5)", Debug)  
  NOr (0x11111111, 0x22222222, Local5)  
  if (LNotEqual (Local5, 0xCCCCCCCC))
```

```

{
  ERR_ (1)
}

Store ("+++++++ XOr (0x11113333, 0x22222222, Local6)", Debug)
XOr (0x11113333, 0x22222222, Local6)
if (LNotEqual (Local6, 0x33331111))
{
  ERR_ (1)
}

Store ("+++++++ ShiftLeft (0x11112222, 2, Local7)", Debug)
ShiftLeft (0x11112222, 2, Local7)
if (LNotEqual (Local7, 0x44448888))
{
  ERR_ (1)
}

Store ("+++++++ ShiftRight (Local7, 2, Local7)", Debug)
ShiftRight (Local7, 2, Local7)
if (LNotEqual (Local7, 0x11112222))
{
  ERR_ (1)
}

Store ("+++++++ Not (Local0, Local1)", Debug)
Store (0x22224444, Local0)
Not (Local0, Local1)
if (LNotEqual (Local0, 0x22224444))
{
  ERR_ (2)
}

if (LNotEqual (Local1, 0xDDDDBBBB))
{
  ERR_ (1)
}

Return (Local7)
}

Method (LOGS)
{

Store ("+++++++ Store (LAnd (0xFFFFFFFF, 0x11111111), Local0)", Debug)
Store (LAnd (0xFFFFFFFF, 0x11111111), Local0)

```

```

Store ("+++++++ Store (LEqual (0xFFFFFFFF, 0x11111111), Local)", Debug)
Store (LEqual (0xFFFFFFFF, 0x11111111), Local1)

Store ("+++++++ Store (LGreater (0xFFFFFFFF, 0x11111111), Local2)", Debug)
Store (LGreater (0xFFFFFFFF, 0x11111111), Local2)

Store ("+++++++ Store (LGreaterEqual (0xFFFFFFFF, 0x11111111), Local3)", Debug)
Store (LGreaterEqual (0xFFFFFFFF, 0x11111111), Local3)

Store ("+++++++ Store (LLess (0xFFFFFFFF, 0x11111111), Local4)", Debug)
Store (LLess (0xFFFFFFFF, 0x11111111), Local4)

Store ("+++++++ Store (LLessEqual (0xFFFFFFFF, 0x11111111), Local5)", Debug)
Store (LLessEqual (0xFFFFFFFF, 0x11111111), Local5)

Store ("+++++++ Store (LNot (0x31313131), Local6)", Debug)
Store (0x00001111, Local6)
Store (LNot (Local6), Local7)
if (LNotEqual (Local6, 0x00001111))
{
    ERR_ (2)
}

if (LNotEqual (Local7, 0x0))
{
    ERR_ (1)
}

Store ("+++++++ Store (LNotEqual (0xFFFFFFFF, 0x11111111), Local7)", Debug)
Store (LNotEqual (0xFFFFFFFF, 0x11111111), Local7)

Store ("+++++++ Lor (0x0, 0x1)", Debug)
if (Lor (0x0, 0x1))
{
    Store ("+_+_+_+ Lor (0x0, 0x1) returned TRUE", Debug)
}

return (Local7)
}

Method (COND)
{
    Store ("+++++++ Store (0x4, Local0)", Debug)
    Store (0x4, Local0)
}

```

```

Store ("+++++++ While (Local0)", Debug)
While (Local0)
{
    Store ("+++++++ Decrement (Local0)", Debug)
    Decrement (Local0)
}

Store ("+++++++ Store (0x3, Local6)", Debug)
Store (0x3, Local6)

Store ("+++++++ While (Subtract (Local6, 1))", Debug)
While (Subtract (Local6, 1))
{
    Store ("+++++++ Decrement (Local6)", Debug)
    Decrement (Local6)
}

Store ("+++++++ [LVL1] If (LGreater (0x2, 0x1))", Debug)
If (LGreater (0x2, 0x1))
{
    Store ("+++++++ [LVL2] If (LEqual (0x11111111, 0x22222222))", Debug)
    If (LEqual (0x11111111, 0x22222222))
    {
        Store ("+++++++ ERROR: If (LEqual (0x11111111, 0x22222222)) returned TRUE", Debug)
    }

else
{
    Store ("+++++++ [LVL3] If (LNot (0x0))", Debug)
    If (LNot (0x0))
    {
        Store ("+++++++ [LVL4] If (LAnd (0xEEEEEEEE, 0x2))", Debug)
        If (LAnd (0xEEEEEEEE, 0x2))
        {
            Store ("+++++++ [LVL5] If (LLess (0x44444444, 0x3))", Debug)
            If (LLess (0x44444444, 0x3))
            {
                Store ("+++++++ ERROR: If (LLess (0x44444444, 0x3)) returned TRUE", Debug)
            }

else
{
            Store ("+++++++ Exiting from nested IF/ELSE statements", Debug)
        }
    }
}
}
}

```

```
    }  
  }  
  
  Store ("+++++++ [LVL1] If (LGreater (0x2, 0x1))", Debug)  
  If (LGreater (0x2, 0x1))  
  {  
    Store ("+++++++ [LVL2] If (LEqual (0x11111111, 0x22222222))", Debug)  
    If (LEqual (0x11111111, 0x22222222))  
    {  
      Store ("+++++++ ERROR: If (LEqual (0x11111111, 0x22222222)) returned TRUE", Debug)  
    }  
  
    else  
    {  
      Store ("+++++++ [LVL3] If (LNot (0x0))", Debug)  
      If (LNot (0x0))  
      {  
        Store ("+++++++ [LVL4] If (LAnd (0xEEEEEEEE, 0x2))", Debug)  
        If (LAnd (0xEEEEEEEE, 0x2))  
        {  
          Store ("+++++++ [LVL5] If (LLess (0x44444444, 0x3))", Debug)  
          If (LLess (0x44444444, 0x3))  
          {  
            Store ("+++++++ ERROR: If (LLess (0x44444444, 0x3)) returned TRUE", Debug)  
          }  
  
          else  
          {  
            Store ("+++++++ Returning from nested IF/ELSE statements", Debug)  
            Return (Local6)  
          }  
        }  
      }  
    }  
  }  
}
```

Method (REFS)

```
{  
  Name (BBUF, Buffer() {0xB0, 0xB1, 0xB2, 0xB3, 0xB4, 0xB5, 0xB6, 0xB7})  
  
  Name (NEST, Package ())  
  {  
    Package ()  
    {
```

```
    0x01, 0x02, 0x03, 0x04, 0x05, 0x06
  },
  Package ()
  {
    0x11, 0x12, 0x12, 0x14, 0x15, 0x16
  }
})
```

```
/* Parser thinks this is a method invocation!! */
```

```
Store (RefOf (MAIN), Local5)
```

```
// For this to work, ABCD must NOT exist.
```

```
Store (CondRefOf (ABCD, Local0), Local1)
if (LNotEqual (Local1, 0))
{
  ERR_ (2)
}
```

```
Store (CondRefOf (BBUF, Local0), Local1)
if (LNotEqual (Local1, Ones))
{
  ERR_ (2)
}
```

```
Store (DeRefOf (Index (BBUF, 3)), Local6)
if (LNotEqual (Local6, 0xB3))
{
  ERR_ (2)
}
```

```
Store (DeRefOf (Index (DeRefOf (Index (NEST, 1)), 3)), Local0)
if (LNotEqual (Local0, 0x14))
{
  ERR_ (2)
}
```

```
Store (0x11223344, Local0)
Store (RefOf (Local0), Local1)
```

```
Store (DerefOf (Local1), Local2)
If (LNotEqual (Local2, 0x11223344))
{
  ERR_ (2)
}
```

```

/* Parser thinks this is a method invocation!! */

// RefOf (MAIN)

// RefOf (R___)
// RefOf (BBUF)

// Store (RefOf (Local0), Local1)

// CondRefOf (BBUF, Local2)
// CondRefOf (R___, Local3)

// Store (DerefOf (Local1), Local4)

// Return (Local4)
}

Method (INDX, 0)
{
    Name(STAT,Package(4){ })
    Store(0x44443333,Index(STAT,0))
}

//=====
//=====
//===== iPCO TESTS =====
//=====
//=====
//
//
// test IfElseOp.asl
//
// test for IfOp and ElseOp, including validation of object stack cleanup
//
Device (IFEL)
{
    Name (DWRD, 1)
    Name (RSLT, 0)

    // IFNR control method executes IfOp branch with NO nested Return
    // and no Else branch
    Method (IFNR)
    {
        Store (DWRD, RSLT)
        If (LEqual (DWRD, 1))

```

```

    {
        Store (0, RSLT)
    }
} // IFNR

// NINR control method does not execute If branch and has no Else branch
Method (NINR)
{
    Store (0, RSLT)
    If (LNotEqual (DWRD, 1))
    {
        Store (DWRD, RSLT)
    }
} // NINR

// IENR control method executes IfOp branch with NO nested Return
Method (IENR)
{
    If (LEqual (DWRD, 1))
    {
        Store (0, RSLT)
    }
    Else
    {
        Store (DWRD, RSLT)
    }
} // IENR

// ELNR control method executes ElseOp branch with NO nested Return
Method (ELNR)
{
    If (LNotEqual (DWRD, 1))
    {
        Store (DWRD, RSLT)
    }
    Else
    {
        Store (0, RSLT)
    }
} // ELNR

// IFRT control method executes IfOp branch with nested Return with
// no Else branch
Method (IFRT)
{
    If (LEqual (DWRD, 1))
    {

```



```

    Return (0)
  }
  Return (DWRD)
} // IFRT

// IERT control method executes IfOp branch with nested Return with
// Else branch
Method (IERT)
{
  If (LEqual (DWRD, 1))
  {
    Return (0)
  }
  Else
  {
    Return (DWRD)
  }
} // IERT

// ELRT control method executes ElseOp branch with nested Return
Method (ELRT)
{
  If (LNotEqual (DWRD, 1))
  {
    Return (DWRD)
  }
  Else
  {
    Return (0)
  }
} // ELRT

Method (TEST)
{
  Store ("+++++++ IfElseOp Test", Debug)

  // IfOp with NO return value
  IFNR()
  If (LNotEqual (RSLT, 0))
  {
    Return (RSLT)
  }

  // IfOp with NO return value
  NINR()
  If (LNotEqual (RSLT, 0))
  {
    Return (RSLT)
  }
}

```

```

}

// IfOp with NO return value
IENR()
If (LNotEqual (RSLT, 0))
{
    Return (RSLT)
}

// ElseOp with NO return value
ELNR()
If (LNotEqual (RSLT, 0))
{
    Return (RSLT)
}

// IfOp with return value
Store (IFRT, RSLT)
If (LNotEqual (RSLT, 0))
{
    Return (RSLT)
}

// IfOp with return value
Store (IERT, RSLT)
If (LNotEqual (RSLT, 0))
{
    Return (RSLT)
}

// ElseOp with return value
Store (ELRT, RSLT)
If (LNotEqual (RSLT, 0))
{
    Return (RSLT)
}

Return (0)
} // TEST
} // IFEL

//
// test NoSave.asl
//
//
// Internal test cases to validate IfOp (Operator (,)) where Operator
// target is ZeroOp to throw away the results.
// Includes internal test cases for logical operators with no destination

```

```

// operands.
//
Device (NOSV)
{
  Method (TEST)
  {
    Store ("+++++++ NoSave Test", Debug)

    Name (WRD, 0x1234)

    //
    // Begin test of nested operators without saving results
    //

    // Test If (And ()) with no save of And result
    If (And (3, 1, ))
    {
      Store (1, WRD) // pass -- just do something
    }
    else
    {
      Return (1) // fail
    }

    // Test If (And ()) with no save of And result
    If (And (4, 1, ))
    {
      Return (2) // fail
    }
    else
    {
      Store (2, WRD) // pass -- just do something
    }

    // Test If (NAnd ()) with no save of NAnd result
    If (NAnd (3, 1, ))
    {
      Store (3, WRD) // pass -- just do something
    }
    else
    {
      Return (3) // fail
    }

    // Test If (NAnd ()) with no save of NAnd result
    If (NAnd (0xFFFFFFFF, 0xFFFFFFFF, ))
    {

```

```

    Return (4)    // fail
}
else
{
    Store (4, WRD) // pass -- just do something
}

// Test If (NOr ()) with no save of NOr result
If (NOr (0, 1, ))
{
    Store (5, WRD) // pass -- just do something
}
else
{
    Return (5)    // fail
}

// Test If (NOr ()) with no save of NOr result
If (NOr (0xFFFFFFFF, 1, ))
{
    Return (6)    // fail
}
else
{
    Store (6, WRD) // pass -- just do something
}

// Test If (Not ()) with no save of Not result
If (Not (1, ))
{
    Store (7, WRD) // pass -- just do something
}
else
{
    Return (7)    // fail
}

// Test If (Not ()) with no save of Not result
If (Not (0xFFFFFFFF, ))
{
    Return (8)    // fail
}
else
{
    Store (8, WRD) // pass -- just do something
}

```

```

// Test If (Or ()) with no save of Or result
If (Or (3, 1, ))
{
    Store (9, WRD) // pass -- just do something
}
else
{
    Return (9) // fail
}

// Test If (Or ()) with no save of Or result
If (Or (0, 0, ))
{
    Return (10) // fail
}
else
{
    Store (10, WRD) // pass -- just do something
}

// Test If (XOr ()) with no save of XOr result
If (XOr (3, 1, ))
{
    Store (11, WRD) // pass -- just do something
}
else
{
    Return (11) // fail
}

// Test If (XOr ()) with no save of XOr result
If (XOr (3, 3, ))
{
    Return (12) // fail
}
else
{
    Store (12, WRD) // pass -- just do something
}

//
// Begin test of logical operators with no destination operands
//

```

```
// Test If (LAnd ()) with no save of LAnd result
If (LAnd (3, 3))
{
    Store (21, WRD) // pass -- just do something
}
else
{
    Return (21) // fail
}
```

```
// Test If (LAnd ()) with no save of LAnd result
If (LAnd (3, 0))
{
    Return (22) // fail
}
else
{
    Store (22, WRD) // pass -- just do something
}
```

```
// Test If (LAnd ()) with no save of LAnd result
If (LAnd (0, 3))
{
    Return (23) // fail
}
else
{
    Store (23, WRD) // pass -- just do something
}
```

```
// Test If (LAnd ()) with no save of LAnd result
If (LAnd (0, 0))
{
    Return (24) // fail
}
else
{
    Store (24, WRD) // pass -- just do something
}
```

```
// Test If (LEqual ()) with no save of LEqual result
If (LEqual (3, 3))
{
    Store (31, WRD) // pass -- just do something
}
else
{
```

```

    Return (31) // fail
}

// Test If (LEqual ()) with no save of LEqual result
If (LEqual (1, 3))
{
    Return (32) // fail
}
else
{
    Store (32, WRD) // pass -- just do something
}

// Test If (LGreater ()) with no save of LGreater result
If (LGreater (3, 1))
{
    Store (41, WRD) // pass -- just do something
}
else
{
    Return (41) // fail
}

// Test If (LGreater ()) with no save of LGreater result
If (LGreater (4, 4))
{
    Return (42) // fail
}
else
{
    Store (42, WRD) // pass -- just do something
}

// Test If (LGreater ()) with no save of LGreater result
If (LGreater (1, 4))
{
    Return (43) // fail
}
else
{
    Store (43, WRD) // pass -- just do something
}

// Test If (LGreaterEqual ()) with no save of LGreaterEqual result
If (LGreaterEqual (3, 1))
{
    Store (44, WRD) // pass -- just do something
}

```

```

}
else
{
    Return (44) // fail
}

// Test If (LGreaterEqual ()) with no save of LGreaterEqual result
If (LGreaterEqual (3, 3))
{
    Store (45, WRD) // pass -- just do something
}
else
{
    Return (45) // fail
}

// Test If (LGreaterEqual ()) with no save of LGreaterEqual result
If (LGreaterEqual (3, 4))
{
    Return (46) // fail
}
else
{
    Store (46, WRD) // pass -- just do something
}

// Test If (LLess ()) with no save of LLess result
If (LLess (1, 3))
{
    Store (51, WRD) // pass -- just do something
}
else
{
    Return (51) // fail
}

// Test If (LLess ()) with no save of LLess result
If (LLess (2, 2))
{
    Return (52) // fail
}
else
{
    Store (52, WRD) // pass -- just do something
}

// Test If (LLess ()) with no save of LLess result

```



```

If (LLess (4, 2))
{
    Return (53) // fail
}
else
{
    Store (53, WRD) // pass -- just do something
}

// Test If (LLessEqual ()) with no save of LLessEqual result
If (LLessEqual (1, 3))
{
    Store (54, WRD) // pass -- just do something
}
else
{
    Return (54) // fail
}

// Test If (LLessEqual ()) with no save of LLessEqual result
If (LLessEqual (2, 2))
{
    Store (55, WRD) // pass -- just do something
}
else
{
    Return (55) // fail
}

// Test If (LLessEqual ()) with no save of LLessEqual result
If (LLessEqual (4, 2))
{
    Return (56) // fail
}
else
{
    Store (56, WRD) // pass -- just do something
}

// Test If (LNot ()) with no save of LNot result
If (LNot (0))
{
    Store (61, WRD) // pass -- just do something
}
else
{

```

```

    Return (61) // fail
}

// Test If (LNot ()) with no save of LNot result
If (LNot (1))
{
    Return (62) // fail
}
else
{
    Store (62, WRD) // pass -- just do something
}

// Test If (LNotEqual ()) with no save of LNotEqual result
If (LNotEqual (3, 3))
{
    Return (63) // fail
}
else
{
    Store (63, WRD) // pass -- just do something
}

// Test If (LNotEqual ()) with no save of LNotEqual result
If (LNotEqual (1, 3))
{
    Store (64, WRD) // pass -- just do something
}
else
{
    Return (64) // fail
}

// Test If (LOr ()) with no save of LOr result
If (LOr (3, 1))
{
    Store (71, WRD) // pass -- just do something
}
else
{
    Return (71) // fail
}

// Test If (LOr ()) with no save of LOr result
If (LOr (0, 1))
{

```

```

    Store (72, WRD) // pass -- just do something
}
else
{
    Return (72) // fail
}

// Test If (LOr ()) with no save of LOr result
If (LOr (3, 0))
{
    Store (73, WRD) // pass -- just do something
}
else
{
    Return (73) // fail
}

// Test If (LOr ()) with no save of LOr result
If (LOr (0, 0))
{
    Return (74) // fail
}
else
{
    Store (74, WRD) // pass -- just do something
}

Return (0)
} // TEST
} // NOSV

//
// test IndxFld.asl
//
// IndexFld test
// This is just a subset of the many RegionOp/Index Field test cases.
// Tests index field element AccessAs macro.
//
Device (IDXF)
{ // Test device name

    OperationRegion (SIO, SystemIO, 0x100, 2)
    Field (SIO, ByteAcc, NoLock, Preserve)
    {
        INDX, 8,
        DATA, 8
    }
}

```

IndexField (INDX, DATA, AnyAcc, NoLock, WriteAsOnes)

```
{  
    AccessAs (ByteAcc, 0),  
    IFE0, 8,  
    IFE1, 8,  
    IFE2, 8,  
    IFE3, 8,  
    IFE4, 8,  
    IFE5, 8,  
    IFE6, 8,  
    IFE7, 8,  
    IFE8, 8,  
    IFE9, 8,  
}
```

Method (TEST)

```
{  
    Store ("+++++++ IndxFld Test", Debug)  
  
    Store (IFE0, Local0)  
    Store (IFE1, Local1)  
    Store (IFE2, Local2)  
  
    Return (0)  
} // TEST  
} // IDXF
```

//

// test NestdLor.asl

//

Scope (_SB) // System Bus

```
{ // _SB system bus
```

Name (ZER0, 0)

Name (ZER1, 0)

Name (ZER2, 0)

Name (ONE0, 1)

Device (NSTL)

```
{  
    Method (TEST)  
    {  
        Store ("+++++++ NestdLor Test", Debug)  
  
        If (Lor (ZER0, Lor (ZER1, Lor (ZER2, ONE0))))  
        { // Indicate Pass  
            Store (0x00, Local0)  
        }  
    }  
}
```

```

    Else
    { // Indicate Fail
        Store (0x01, Local0)
    }

    Return (Local0)
} // End Method TEST
} // Device NSTL
} // _SB system bus

//
// test RetBuf.asl
//
// Test ReturnOp(Buffer)
// This is required to support Control Method Batteries on
// Dell Latitude Laptops (e.g., CP1-A)
//
Device (RTBF)
{
    Method (SUBR, 1)
    {
        Return (Arg0)
    }

    Method (RBUF)
    { // RBUF: Return Buffer from local variable
        Name (ABUF, Buffer() {"ARBITRARY_BUFFER"})

        // store local buffer ABUF into Local0
        Store (ABUF, Local0)

        // save Local0 object type value into Local1
        Store (ObjectType (Local0), Local1)

        // validate Local0 is a Buffer
        If (LNotEqual (Local1, 3)) // Buffer type is 3
        {
            Return (1) // failure
        }

        // store value returned by control method SUBR into Local0
        Store (SUBR (ABUF), Local0)

        // save Local0 object type value into Local1
        Store (ObjectType (Local0), Local1)

        // validate Local0 is a Buffer

```

```

If (LNotEqual (Local1, 3)) // Buffer type is 3
{
    Return (2) // failure
}

// allocate buffer using Local1 as buffer size (run-time evaluation)
Store (5, Local1)
Name (BUFR, Buffer(Local1) {})

// store value returned by control method SUBR into Local0
Store (SUBR (BUFR), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Buffer
If (LNotEqual (Local1, 3)) // Buffer type is 3
{
    Return (3) // failure
}

// store BUFR Buffer into Local0
Store (BUFR, Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Buffer
If (LNotEqual (Local1, 3)) // Buffer type is 3
{
    Return (4) // failure
}

// return Local0 Buffer
Return (Local0)
} // RBUF

Method (TEST)
{
    Store ("+++++++ RetBuf Test", Debug)

// store RBUF Buffer return value into Local0
Store (RBUF, Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

```

```

// validate Local0 is a Buffer
If (LNotEqual (Local1, 3)) // Buffer type is 3
{
    Return (10) // failure
}
Else
{
    Return (0) // success
}
} // TEST
} // RTBF

//
// test RetLVal.asl
//
// Test ReturnOp(Lvalue)
// This is required to support _PSR on IBM ThinkPad 560D and
// _DCK on Toshiba Tecra 8000.
//

Device (GPE2)
{
    Method (_L03)
    {
        Store ("Method GPE2._L03 invoked", Debug)
        Return ()
    }

    Method (_E05)
    {
        Store ("Method GPE2._E05 invoked", Debug)
        Return ()
    }
}

Device (PRW2)
{
    Name (_PRW, Package(2) {Package(2){\GPE2, 0x05}, 3})
}

Scope (\_GPE)
{
    Name (ACST, 0xFF)

    Method (_L08)
    {
        Store ("Method _GPE._L08 invoked", Debug)
    }
}

```

```

    Return ()
}

Method (_E09)
{
    Store ("Method _GPE._E09 invoked", Debug)
    Return ()
}

Method (_E11)
{
    Store ("Method _GPE._E11 invoked", Debug)
    Notify (\PRW1, 2)
}

Method (_L22)
{
    Store ("Method _GPE._L22 invoked", Debug)
    Return ()
}

Method (_L33)
{
    Store ("Method _GPE._L33 invoked", Debug)
    Return ()
}

Method (_E64)
{
    Store ("Method _GPE._E64 invoked", Debug)
    Return ()
}

} // _GPE

Device (PRW1)
{
    Name (_PRW, Package(2) {0x11, 3})
}

Device (PWRB)
{
    Name (_HID, EISAID("PNP0C0C"))
    Name (_PRW, Package(2) {0x33, 3})
}

Scope (\_SB) // System Bus

```



```

{ // _SB system bus

Device (ACAD)
{ // ACAD: AC adapter device
  Name (_HID, "ACPI0003") // AC adapter device

  Name (_PCL, Package () {\_SB})

  OperationRegion (AREG, SystemIO, 0x0372, 2)
  Field (AREG, ByteAcc, NoLock, Preserve)
  {
    AIDX, 8,
    ADAT, 8
  }
  IndexField (AIDX, ADAT, ByteAcc, NoLock, Preserve)
  {
    , 1, // skips
    ACIN, 1,
    , 2, // skips
    CHAG, 1,
    , 3, // skips
    , 7, // skips
    ABAT, 1,
  } // IndexField

Method (_PSR)
{
  Store (\_GPE.ACST, Local0)
  Store (ACIN, Local1)
  If (LNotEqual (\_GPE.ACST, Local1))
  {
    Store (Local1, \_GPE.ACST)
    // This Notify is commented because it causes a
    // method error when running on a system without the
    // specific device.
    // Notify (\_SB.ACAD, 0)
  }
  Return (Local0)
} // _PSR

Method (_STA)
{
  Return (0x0F)
}

Method (_INI)
{
  Store (ACIN, \_GPE.ACST)

```

```

    }
} // ACAD: AC adapter device

// test implicit return from control method
Method (DIS_, 1)
{
    Store (Arg0, Local0)
}

Device (RTL_V)
{
    // test implicit return inside nested if with explicit return of Lvalue
    Method (_DCK, 1)
    // Arg0: 1 == dock, 0 == undock
    {
        If (Arg0)
        { // dock
            Store (0x87, Local0)

            If (Local0)
            {
                DIS_ (0x23)
                Return (1)
            }

            Return (0)
        } // dock
        Else
        { // undock
            Store (Arg0, Local0)

            If (Local0)
            {
                DIS_ (0x23)
                Return (1)
            }

            Return (0)
        } // undock
    } // _DCK control method

    Method (TEST)
    {
        Store ("+++++++ RetLVal Test", Debug)

        // store _PSR return value into Local0
        Store (\_SB_.ACAD._PSR, Local0)
    }
}

```

```

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number/Integer type is 1
{
    Return (1) // failure
}

// test implicit return inside nested if with explicit return of Lvalue
Store (_DCK (1), Local2)

// save Local2 object type value into Local3
Store (ObjectType (Local2), Local3)

// validate Local2 is a Number
If (LNotEqual (Local3, 1)) // Number/Integer type is 1
{
    Return (2) // failure
}

If (LNotEqual (Local2, 1))
{
    Return (3) // failure
}

Return (0) // success
} // TEST
} // RTL
} // _SB system bus

//
// test RetPkg.asl
//
// Test ReturnOp(Package)
// This is required to support _PRT on Dell Optiplex Workstations (e.g. GX1)
//

Scope (\_SB) // System Bus
{ // _SB system bus
    Device(LNKA)
    {
        Name (_HID, EISAID("PNP0C0F")) // PCI interrupt link
        Name (_UID, 1)
    }
    Device(LNKB)
    {
        Name (_HID, EISAID("PNP0C0F")) // PCI interrupt link
    }
}

```

```

    Name (_UID, 2)
}
Device(LNKC)
{
    Name (_HID, EISAID("PNP0C0F")) // PCI interrupt link
    Name (_UID, 3)
}
Device(LNKD)
{
    Name (_HID, EISAID("PNP0C0F")) // PCI interrupt link
    Name (_UID, 4)
}

Device (PCI1)
{ // PCI1: Root PCI Bus
    Name (_HID, "PNP0A03") // Need _HID for root device (String format)
    Name (_ADR, 0x00000000)
    Name (_CRS, 0)

    Name (_PRT, Package ()
    {
        Package () {0x0004ffff, 0, LNKA, 0}, // Slot 1, INTA
        Package () {0x0004ffff, 1, LNKB, 0}, // Slot 1, INTB
        Package () {0x0004ffff, 2, LNKC, 0}, // Slot 1, INTC
        Package () {0x0004ffff, 3, LNKD, 0}, // Slot 1, INTD
        Package () {0x0005ffff, 0, \_SB_.LNKB, 0}, // Slot 2, INTA
        Package () {0x0005ffff, 1, \_SB_.LNKC, 0}, // Slot 2, INTB
        Package () {0x0005ffff, 2, \_SB_.LNKD, 0}, // Slot 2, INTC
        Package () {0x0006ffff, 3, \_SB_.LNKA, 0}, // Slot 2, INTD
        Package () {0x0006ffff, 0, LNKC, 0}, // Slot 3, INTA
        Package () {0x0006ffff, 1, LNKD, 0}, // Slot 3, INTB
        Package () {0x0006ffff, 2, LNKA, 0}, // Slot 3, INTC
        Package () {0x0006ffff, 3, LNKB, 0}, // Slot 3, INTD
    })

    Device (PX40)
    { // Map f0 space, Start PX40
        Name (_ADR, 0x00070000) // Address+function.
    }
} // PCI0: Root PCI Bus

Device (RETP)
{
    Method (RPKG)
    { // RPKG: Return Package from local variable

        // store _PRT package into Local0
        Store (\_SB_.PCI1._PRT, Local0)
    }
}

```

```

    // return Local0 Package
    Return (Local0)
} // RPKG

Method (TEST)
{
    Store ("+++++++ RetPkg Test", Debug)

    // store RPKG package return value into Local0
    Store (RPKG, Local0)

    // save Local0 object type value into Local1
    Store (ObjectType (Local0), Local1)

    // validate Local0 is a Package
    If (LNotEqual (Local1, 4)) // Package type is 4
        { Return (1) } // failure
    Else
        { Return (0) } // success
    } // TEST
} // RETP
} // _SB_

//
// test WhileRet.asl
//
// WhileRet.asl tests a ReturnOp nested in a IfOp nested in a WhileOp.
//
Device (WHLR)
{
    Name (LCNT, 0)
    Method (WIR)
    { // WIR: control method that returns inside of IfOp inside of WhileOp
        While (LLess (LCNT, 4))
        {
            If (LEqual (LCNT, 2))
            {
                Return (0)
            }

            Increment (LCNT)
        }

        Return (LCNT)
    } // WIR: control method that returns inside of IfOp inside of WhileOp

    Method (TEST)

```

```

    {
        Store ("+++++++ WhileRet Test", Debug)

        Store (WIR, Local0)

        Return (Local0)
    } // TEST
} // WHLR

//
// test AndOrOp.asl
//
//This code tests the bitwise AndOp and OrOp Operator terms
//
//Syntax of Andop term
//And - Bitwise And
//AndTerm := And(
// Source1, //TermArg=>Integer
// Source2, //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source1 and Source2 are evaluated as integer data types,
// a bit-wise AND is performed, and the result is optionally
//stored into Result.
//
//
//Syntax of OrOp
//Or - Bit-wise Or
//OrTerm := Or(
// Source1, //TermArg=>Integer
// Source2 //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source1 and Source2 are evaluated as integer data types,
// a bit-wise OR is performed, and the result is optionally
//stored in Result
//
Device (AND0)
{
    OperationRegion (TMEM, SystemMemory, 0xC4, 0x02)
    Field (TMEM, ByteAcc, NoLock, Preserve)
    {
        , 3,
        TOUD, 13
    }

    //Create System Memory Operation Region and field overlays
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)

```

Field (RAM, AnyAcc, NoLock, Preserve)

```
{  
    SMDW, 32, // 32-bit DWORD  
    SMWD, 16, // 16-bit WORD  
    SMBY, 8, // 8-bit BYTE  
} // Field(RAM)
```

//And with Byte Data

Name (BYT1, 0xff)

Name (BYT2, 0xff)

Name (BRSL, 0x00)

//And with Word Data

Name (WRD1, 0xffff)

Name (WRD2, 0xffff)

Name (WRSL, 0x0000)

//And with DWord Data

Name (DWD1, 0xffffffff)

Name (DWD2, 0xffffffff)

Name (DRSL, 0x00000000)

Method (ANDP)

```
{  
    //Check with 1 And 1 on byte data  
    And(BYT1, BYT2, BRSL)  
    if(LNotEqual(BRSL,0xff))  
    {Return(1)}  
  
    //Check with 1 And 1 on Word data  
    And(WRD1, WRD2, WRSL)  
    if(LNotEqual(WRSL,0xffff))  
    {  
        Return (1) // failure  
    }  
  
    //Check with 1 And 1 Dword  
    And(DWD1, DWD2, DRSL)  
    if(LNotEqual(DRSL,0xffffffff))  
    {  
        Return (1) // failure  
    }  
  
    //Check with 0 And 0 on byte data  
    Store(0x00,BYT1)  
    Store(0x00,BYT2)  
    Store(0x00,BRSL)
```

```

And(BYT1, BYT2, BRSL)
if(LNotEqual(BRSL,0x00))
{
    Return (1)    // failure
}

//Check with 0 And 0 on Word data
Store (0x0000,WRD1)
Store (0x0000,WRD2)
Store (0x0000,WRSL)
And(WRD1, WRD2, WRSL)
if(LNotEqual(WRSL,0x0000))
{
    Return (1)    // failure
}

//Check with 0 And 0 Dword
Store (0x00000000,DWD1)
Store (0x00000000,DWD2)
Store (0x00000000,DRSL)
And(DWD1, DWD2, DRSL)
if(LNotEqual(DRSL,0x00000000))
{
    Return (1)    // failure
}

//Check with 1 And 0 on byte data
Store(0x55,BYT1)
Store(0xAA,BYT2)
Store(0x00,BRSL)
And(BYT1, BYT2, BRSL)
if(LNotEqual(BRSL,0x00))
{
    Return (1)    // failure
}

//Check with 1 And 0 on Word data
Store (0x5555,WRD1)
Store (0xAAAA,WRD2)
Store (0x0000,WRSL)
And(WRD1, WRD2, WRSL)
if(LNotEqual(WRSL,0x0000))
{
    Return (1)    // failure
}

//Check with 1 And 0 on Dword

```



```
Store (0x55555555,DWD1)
Store (0xAAAAAAAA,DWD2)
Store (0x00000000,DRSL)
And(DWD1, DWD2, DRSL)
if(LNotEqual(DRSL,0x00000000))
{
    Return (1)    // failure
}

```

```
Store (0x1FFF, TOUD)
Store (TOUD, Local0)
if(LNotEqual(Local0,0x1FFF))
{
    Return (1)    // failure
}

```

//TBD- Do We need to check for system memory data also for each test case ??

```
Return(0)
```

```
}//ANDP
```

```
Method (OROP)
```

```
{
    //Check with 1 Ored with 1 on byte data
    Store(0xff,BYT1)
    Store(0xff,BYT2)
    Store(0x00,BRSL)
    Or(BYT1, BYT2, BRSL)
    if(LNotEqual(BRSL,0xff))
    {
        Return (1)    // failure
    }
}

```

```
//Check with 1 Ored with 1 on Word data
Store(0xffff,WRD1)
Store(0xffff,WRD2)
Store(0x0000,WRS�)
Or(WRD1, WRD2, WRS�)
if(LNotEqual(WRS�,0xffff))
{
    Return (1)    // failure
}

```

```
//Check with 1 Ored with 1 on Dword data
Store(0xffffffff,DWD1)

```

```

Store(0xffffffff,DWD2)
Store(0x00000000,DRSL)
Or(DWD1, DWD2, DRSL)
if(LNotEqual(DRSL,0xffffffff))
{
    Return (1)    // failure
}

//Check with 0 Ored with 0 on byte data
Store(0x00,BYT1)
Store(0x00,BYT2)
Store(0x00,BRSL)
Or(BYT1, BYT2, BRSL)
if(LNotEqual(BRSL,0x00))
{
    Return (1)    // failure
}

//Check with 0 Ored with 0 on Word data
Store (0x0000,WRD1)
Store (0x0000,WRD2)
Store (0x0000,WRSL)
Or(WRD1, WRD2, WRSL)
if(LNotEqual(WRSL,0x0000))
{
    Return (1)    // failure
}

//Check with 0 Ored with 0 Dword data
Store (0x00000000,DWD1)
Store (0x00000000,DWD2)
Store (0x00000000,DRSL)
Or(DWD1, DWD2, DRSL)
if(LNotEqual(DRSL,0x00000000))
{
    Return (1)    // failure
}

//Check with 1 Ored with 0 on byte data
Store(0x55,BYT1)
Store(0xAA,BYT2)
Store(0x00,BRSL)
Or(BYT1, BYT2, BRSL)
if(LNotEqual(BRSL,0xff))
{
    Return (1)    // failure
}

```

```

//Check with 1 Ored with 0 on Word data
Store (0x5555,WRD1)
Store (0xAAAA,WRD2)
Store (0x0000,WRS�)
Or(WRD1, WRD2, WRS�)
if(LNotEqual(WRS�,0xffff))
{
    Return (1)    // failure
}

//Check with 1 Ored with 0 on Dword data
Store (0x55555555,DWD1)
Store (0xAAAAAAAA,DWD2)
Store (0x00000000,DRSL)
Or(DWD1, DWD2, DRSL)
if(LNotEqual(DRSL,0xffffffff))
{
    Return (1)    // failure
}

//TBD - Do We need to check for system memory data also for each test case ??

Return(0)

} //OROP

Method(TEST)
{
    Store ("+++++++ AndOrOp Test", Debug)

    Name(RSLT,1)
    //Call Andop method
    Store(ANDP,RSLT)
    if(LEqual(RSLT,1))
    {
        Return (RSLT)
    }

    //Call OrOp Method
    Store(OROP,RSLT)
    if(LEqual(RSLT,1))
    {
        Return(RSLT)
    }

    //
    // Return original conditions to allow iterative execution

```

```

//
Store(0xff,BYT1)
Store(0xff,BYT2)
Store(0x00,BRSL)
Store (0xffff,WRD1)
Store (0xffff,WRD2)
Store (0x0000,WRSL)
Store (0xffffffff,DWD1)
Store (0xffffffff,DWD2)
Store (0x00000000,DRSL)

Return(0)
} //TEST
} //AND0

//
// test BreakPnt.asl
//
// This code tests the BreakPoint opcode term. The syntax of BreakPoint Term is
// BreakPointTerm := BreakPoint
// Used for debugging, the Breakpoint opcode stops the execution and enters the AML debugger.
// In the non-debug version of the interpreter, BreakPoint is equivalent to Noop.
//
Device (BRKP)
{
Name(CNT0,0)

Method (BK1)
{
BreakPoint
Return(0)
}

Method (TEST)
{
Store ("+++++++ BreakPnt Test", Debug)

Store(0,CNT0)

//Check BreakPoint statement
While(LLess(CNT0,10))
{
Increment(CNT0)
}

//Check the BreakPoint statement
If(LEqual(CNT0,10))
{

```

```

//      BreakPoint
      Return(0)
    }

    //failed
    Return(1)
  }
}

//
// test AddSubOp.asl
//
Device (ADSU)
{
  // create System Memory Operation Region and field overlays
  OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
  Field (RAM, AnyAcc, NoLock, Preserve)
  {
    SMDW, 32, // 32-bit DWORD
    SMWD, 16, // 16-bit WORD
    SMBY, 8, // 8-bit BYTE
  } // Field(RAM)

  Method (TEST)
  {
    Store ("+++++++ AddSubOp Test", Debug)

    Name (DWRD, 0x12345678)
    Name (WRD, 0x1234)
    Name (BYT, 0x12)

    // Test AddOp with DWORD data
    Store (0x12345678, DWRD)
    Add (DWRD, 7, DWRD)
    If (LNotEqual (DWRD, 0x1234567F))
      { Return (DWRD) }

    // Test AddOp with WORD data
    Add (WRD, 5, WRD)
    If (LNotEqual (WRD, 0x1239))
      { Return (WRD) }

    // Test AddOp with BYTE data
    Add (BYT, 3, BYT)
    If (LNotEqual (BYT, 0x15))
      { Return (BYT) }

    // Test SubtractOp with DWORD data

```

```

Subtract (DWRD, 7, DWRD)
If (LNotEqual (DWRD, 0x12345678))
    { Return (DWRD) }

// Test SubtractOp with WORD data
Subtract (WRD, 3, WRD)
If (LNotEqual (WRD, 0x1236))
    { Return (WRD) }

// Test SubtractOp with BYTE data
Subtract (BYT, 3, BYT)
If (LNotEqual (BYT, 0x12))
    { Return (BYT) }

// test AddOp with DWORD SystemMemory OpRegion
Store (0x01234567, SMDW)
Add (SMDW, 8, SMDW)
If (LNotEqual (SMDW, 0x0123456F))
    { Return (SMDW) }

// test SubtractOp with DWORD SystemMemory OpRegion
Subtract (SMDW, 7, SMDW)
If (LNotEqual (SMDW, 0x01234568))
    { Return (SMDW) }

// test AddOp with WORD SystemMemory OpRegion
Store (0x0123, SMWD)
Add (SMWD, 6, SMWD)
If (LNotEqual (SMWD, 0x0129))
    { Return (SMWD) }

// test SubtractOp with WORD SystemMemory OpRegion
Subtract (SMWD, 5, SMWD)
If (LNotEqual (SMWD, 0x0124))
    { Return (SMWD) }

// test AddOp with BYTE SystemMemory OpRegion
Store (0x01, SMBY)
Add (SMBY, 4, SMBY)
If (LNotEqual (SMBY, 0x05))
    { Return (SMBY) }

// test SubtractOp with BYTE SystemMemory OpRegion
Subtract (SMBY, 3, SMBY)
If (LNotEqual (SMBY, 0x02))

```

```

    { Return (SMBY) }

Return (0)
} // TEST
} // ADSU

//
// test IncDecOp.asl
//
Device (INDC)
{
    // create System Memory Operation Region and field overlays
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
    Field (RAM, AnyAcc, NoLock, Preserve)
    {
        SMDW, 32, // 32-bit DWORD
        SMWD, 16, // 16-bit WORD
        SMBY, 8, // 8-bit BYTE
    } // Field(RAM)

Method (TEST)
{
    Store ("+++++++ IncDecOp Test", Debug)

    Name (DWRD, 0x12345678)
    Name (WRD, 0x1234)
    Name (BYT, 0x12)

    // Test IncrementOp with DWORD data
    Store (0x12345678, DWRD)
    Increment (DWRD)
    If (LNotEqual (DWRD, 0x12345679))
        { Return (DWRD) }

    // Test IncrementOp with WORD data
    Increment (WRD)
    If (LNotEqual (WRD, 0x1235))
        { Return (WRD) }

    // Test IncrementOp with BYTE data
    Increment (BYT)
    If (LNotEqual (BYT, 0x13))
        { Return (BYT) }

    // Test DecrementOp with DWORD data
    Decrement (DWRD)
    If (LNotEqual (DWRD, 0x12345678))
        { Return (DWRD) }
}

```

```

// Test DecrementOp with WORD data
Decrement (WRD)
If (LNotEqual (WRD, 0x1234))
    { Return (WRD) }

// Test DecrementOp with BYTE data
Decrement (BYT)
If (LNotEqual (BYT, 0x12))
    { Return (BYT) }

// test IncrementOp with DWORD SystemMemory OpRegion
Store (0x01234567, SMDW)
Increment (SMDW)
If (LNotEqual (SMDW, 0x01234568))
    { Return (SMDW) }

// test DecrementOp with DWORD SystemMemory OpRegion
Decrement (SMDW)
If (LNotEqual (SMDW, 0x01234567))
    { Return (SMDW) }

// test IncrementOp with WORD SystemMemory OpRegion
Store (0x0123, SMWD)
Increment (SMWD)
If (LNotEqual (SMWD, 0x0124))
    { Return (SMWD) }

// test DecrementOp with WORD SystemMemory OpRegion
Decrement (SMWD)
If (LNotEqual (SMWD, 0x0123))
    { Return (SMWD) }

// test IncrementOp with BYTE SystemMemory OpRegion
Store (0x01, SMBY)
Increment (SMBY)
If (LNotEqual (SMBY, 0x02))
    { Return (SMBY) }

// test DecrementOp with BYTE SystemMemory OpRegion
Decrement (SMBY)
If (LNotEqual (SMBY, 0x01))
    { Return (SMBY) }

Return (0)

```



```

    } // TEST
} // INDC

//
// test LOps.asl
//
//This source tests all the logical operators. Logical operators in ASL are as follows.
//LAnd, LEqual, LGreater, LLess, LNot, LNotEqual, LOr.
// Success will return 0 and failure will return a non zero number. Check the source code for
// non zero number to find where the test failed

Device (LOPS)
{
    //Create System Memory Operation Region and field overlays
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
    Field (RAM, AnyAcc, NoLock, Preserve)
    {
        SMDW, 32, // 32-bit DWORD
        SMWD, 16, // 16-bit WORD
        SMBY, 8, // 8-bit BYTE
    } // Field(RAM)

    //And with Byte Data
    Name (BYT1, 0xff)
    Name (BYT2, 0xff)
    Name (BRSL, 0x00)

    //And with Word Data
    Name (WRD1, 0xffff)
    Name (WRD2, 0xffff)
    Name (WRSL, 0x0000)

    //And with DWord Data
    Name (DWD1, 0xffffffff)
    Name (DWD2, 0xffffffff)
    Name (DRSL, 0x00000000)

    Name(RSLT,1)

    Method (ANDL,2) // Test Logical And
    {
        //test with the arguments passed
        if(LEqual(Arg0,Arg1))
        { Store(LAnd(Arg0,Arg1),RSLT)
          if(LNotEqual(Ones,RSLT))
          {Return(11)}
        }
    }
}

```

```

//test with he locals
Store(Arg0,Local0)
Store(Arg1,Local1)

if(LEqual(Local0,Local1))
{
    Store(LAnd(Local0,Local1),RSLT)
    if(LNotEqual(Ones,RSLT))
        {Return(12)}
}

//test with BYTE data
if(LEqual(BYT1,BYT2))
{ Store(LAnd(BYT1,BYT2),BRSL)
  if(LNotEqual(Ones,BRSL))
    {Return(13)}
}

//test with WORD data
if(LEqual(WRD1,WRD2))
{ Store(LAnd(WRD1,WRD2),WRSL)
  if(LNotEqual(Ones,WRSL))
    {Return(14)}
}

//test with DWORD data
if(LEqual(DWD1,DWD2))
{ Store(LAnd(DWD1,DWD2),DRSL)
  if(LNotEqual(Ones,DRSL))
    {Return(15)}
}

//Test for system memory data for each test case.

Store(0xff,BYT1)
Store(0xff,SMBY)
Store(0x00,BRSL)

//test with BYTE system memory data
if(LEqual(BYT1,SMBY))
{ Store(LAnd(BYT1,SMBY),BRSL)
  if(LNotEqual(Ones,BRSL))
    {Return(16)}
}

Store (0xffff,WRD1)
Store(0xffff,SMWD)
Store(0x0000,WRSL)

```

```

//test with WORD system memory data
if(LEqual(WRD1,SMWD))
{ Store(LAnd(WRD1,SMWD),WRSL)
  if(LNotEqual(Ones,WRSL))
  {Return(17)}
}

Store(0x000000,DRSL)
Store (0xffff,DWD1)
Store(0xffff,SMDW)

//test with DWORD system memory data
if(LEqual(DWD1,SMDW))
{ Store(LAnd(DWD1,SMDW),DRSL)
  if(LNotEqual(Ones,DRSL))
  {Return(18)}
}

Return(0)

} //ANDL

//Test the LOr Operator

Method (ORL_,2)
{ //ORL_

  //test with the arguments passed
  if(LEqual(Arg0,Arg1))
  {
    Store(LOr(Arg0,Arg1),RSLT)
    if(LNotEqual(Ones,RSLT))
    {
      Return(21)
    }
  }
}

//test with he locals
Store(Arg0,Local0)
Store(Arg1,Local1)

if(LEqual(Local0,Local1))
{
  Store(LOr(Local0,Local1),RSLT)
  if(LNotEqual(Ones,RSLT))
  {Return(22)}
}

```

```

//Check with 1 LOred with 0 on byte data
Store(0xff,BYT1)
Store(0x00,BYT2)
Store(0x00,BRSL)

if(LNotEqual(BYT1, BYT2))
{
    Store(LOr(BYT1, BYT2), BRSL)
    if(LNotEqual(Ones,BRSL))
    {Return(23)}
}

//Check with 1 LOred with 0 on WORD data
Store(0xffff,WRD1)
Store(0x0000,WRD2)
Store(0x0000,WRSL)

if(LNotEqual(WRD1, WRD2))
{
    Store(LOr(WRD1, WRD2), WRSL)
    if(LNotEqual(Ones,WRSL))
    {Return(24)}
}

//Check with 1 LOred with 0 on DWORD data
Store(0xffffffff,DWD1)
Store(0x00000000,DWD2)
Store(0x00000000,DRSL)

if(LNotEqual(DWD1, DWD2))
{
    Store(LOr(DWD1, DWD2), DRSL)
    if(LNotEqual(Ones,DRSL))
    {Return(25)}
}

Store(0x00,BYT1)
Store(0xff,SMBY)
Store(0x00,BRSL)

//test with BYTE system memory data
if(LEqual(BYT1,SMBY))
{ Store(LOr(BYT1,SMBY),BRSL)
    if(LNotEqual(Ones,BRSL))
    {Return(26)}
}

Store (0x0000,WRD1)

```

```

Store(0xffff,SMWD)
Store(0x0000,WRSL)

//test with WORD system memory data
if(LEqual(WRD1,SMWD))
{ Store(LOr(WRD1,SMWD),WRSL)
  if(LNotEqual(Ones,WRSL))
  {Return(27)}
}

Store(0x00000000,DWD1)
Store(0xffffffff,SMDW)
Store(0x00000000,DRSL)

//test with DWORD system memory data
if(LEqual(DWD1,SMDW))
{ Store(LAnd(DWD1,SMDW),DRSL)
  if(LNotEqual(Ones,DRSL))
  {Return(28)}
}
Return(0)

} //ORL_

//This method tests LGreater and LNot operator
Method(LSGR,2)
{ //LSGR

  //Test on arguements passed

  //in test data, Arg1 > Arg0
  if(LEqual(Ones,LNot(LGreater(Arg1,Arg0))))
  {Return(31)}

  //test LLessEqual
  if(LEqual(Ones,LNot(LGreaterEqual(Arg1,Arg0))))
  {Return(32)}

  if(LEqual(Ones,LLess(Arg1,Arg0)))
  {Return(33)}

  //test LLessEqual
  if(LEqual(Ones,LLessEqual(Arg1,Arg0)))
  {Return(34)}

  Store(Arg0,Local0)
  Store(Arg1,Local1)

```

```
//test with the locals
if(LNot(LGreater(Local1,Local0)))
    {Return(35)}

//test on Byte data
Store(0x12,BYT1)
Store(0x21,BYT2)

if(LNot(LGreater(BYT2,BYT1)))
    {Return(36)}

if(LNot(LLess(BYT1,BYT2)))
    {Return(37)}

//test LGreaterEqual with byte data
if(LNot(LGreaterEqual(BYT2,BYT1)))
    {Return(38)}

//test LLessEqual byte data
if(LNot(LLessEqual(BYT1,BYT2)))
    {Return(39)}

//test on Word data
Store(0x1212,WRD1)
Store(0x2121,WRD2)

if(LNot(LGreater(WRD2,WRD1)))
    {Return(310)}

if(LNot(LLess(WRD1,WRD2)))
    {Return(311)}

//Test LGreaterEqual with Word Data
if(LNot(LGreaterEqual(WRD2,WRD1)))
    {Return(312)}

//Test LLessEqual with Word Data
if(LNot(LLessEqual(WRD1,WRD2)))
    {Return(313)}

//test on DWord data
Store(0x12121212,DWD1)
Store(0x21212121,DWD2)

if(LNot(LGreater(DWD2,DWD1)))
```

```

    {Return(314)}

if(LNot(LLess(DWD1,DWD2)))
    {Return(315)}

//Test LGreaterEqual with Dword
if(LNot(LGreaterEqual(DWD2,DWD1)))
    {Return(316)}

//Test LLessEqual DWord
if(LNot(LLessEqual(DWD1,DWD2)))
    {Return(317)}

    Return(0)
} //LSGR

//The test method
Method(TEST)
{
    Store ("+++++++ LOps Test", Debug)

    Store(0,RSLT)
    //Call LAndOp method
    Store(ANDL(2,2),RSLT)
    if(LNotEqual(RSLT,0))
        {Return(RSLT)}

    //Call LOrOp Method
    Store(ORL_(5,5),RSLT)
    if(LNotEqual(RSLT,0))
        {Return(RSLT)}

    //Call LSGR Method
    Store(LSGR(5,7),RSLT)
    if(LNotEqual(RSLT,0))
        {Return(RSLT)}

    Return(0)
} //TEST
} //LOPS

//
// test FdSetOps.asl
//
// FindSetLeftBit - Find Set Left Bit
// FindSetLeftBitTerm := FindSetLeftBit
// ( Source, //TermArg=>Integer

```

```

// Result //Nothing | SuperName
// ) => Integer
// Source is evaluated as integer data type, and the one-based bit location of
// the first MSb (most significant set bit) is optionally stored into Result.
// The result of 0 means no bit was set, 1 means the left-most bit set is the
// first bit, 2 means the left-most bit set is the second bit, and so on.
// FindSetRightBit - Find Set Right Bit

// FindSetRightBitTerm := FindSetRightBit
// ( Source, //TermArg=>Integer
// Result //Nothing | SuperName
// ) => Integer
// Source is evaluated as integer data type, and the one-based bit location of
// the most LSb (least significant set bit) is optionally stored in Result.
// The result of 0 means no bit was set, 32 means the first bit set is the
// 32nd bit, 31 means the first bit set is the 31st bit, and so on.

// If the Control method is success Zero is returned. Otherwise a non-zero
// number is returned.
//
Device (FDSO)
{ // FDSO

    // Create System Memory Operation Region and field overlays
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
    Field (RAM, AnyAcc, NoLock, Preserve)
    {
        SMDW, 32, // 32-bit DWORD
        SMWD, 16, // 16-bit WORD
        SMBY, 8, // 8-bit BYTE
    } // Field(RAM)

    // Byte Data
    Name (BYT1, 1)
    Name (BRSL, 0x00)

    // Word Data
    Name (WRD1, 0x100)
    Name (WRSL, 0x0000)

    // DWord Data
    Name (DWD1, 0x10000)
    Name (DRSL, 0x00000000)
    Name (RSLT, 1)
    Name (CNTR, 1)

    Method (SHFT, 2)
    // Arg0 is the actual data and Arg1 is the bit position

```



```

{ // SHFT
  Store (Arg0, Local0)
  Store (Arg1, Local1)

  FindSetLeftBit (Arg0, BRSL)
  If (LNotEqual (BRSL, Arg1))
    { Return (0x11) }
  If (LNotEqual (Arg0, Local0))
    { Return (0x12) }

  FindSetLeftBit (Local0, BRSL)
  If (LNotEqual (BRSL, Local1))
    { Return (0x13) }
  If (LNotEqual (Arg0, Local0))
    { Return (0x14) }

  // test the byte value for SetLeftBit
  Store (7, BYT1)
  FindSetLeftBit (BYT1, BRSL)
  If (LNotEqual (BRSL, 3))
    { Return (0x15) }
  If (LNotEqual (BYT1, 7))
    { Return (0x16) }

  Store (1, BYT1)
  Store (1, CNTR)
  While (LLessEqual (CNTR, 8))
  { // FindSetLeftBit check loop for byte data
    FindSetLeftBit (BYT1, BRSL)
    If (LNotEqual (BRSL, CNTR))
      { Return (0x17) }

    // Shift the bits to check the same
    ShiftLeft (BYT1, 1, BYT1)
    Increment (CNTR)
  } // FindSetLeftBit check loop for byte data

  // Check BYTE value for SetRightBit
  Store (7, BYT1)
  FindSetRightBit (BYT1, BRSL)
  If (LNotEqual (BRSL, 1))
    { Return (0x21) }
  If (LNotEqual (BYT1, 7))
    { Return (0x22) }

  Store (1, CNTR)
  Store (0xFF, BYT1)

```

```

While (LLessEqual (CNTR, 8))
{ // FindSetRightBit check loop for byte data
  FindSetRightBit (BYT1, BRSL)
  If (LNotEqual (BRSL, CNTR))
    { Return (0x23) }

  ShiftLeft (BYT1, 1, BYT1)
  Increment (CNTR)
} // FindSetRightBit check loop for byte data

// Test Word value for SetLeftBit
Store (9, CNTR)
Store (0x100, WRD1)
While (LLessEqual (CNTR, 16))
{
  // FindSetLeftBit check loop for Word data
  FindSetLeftBit (WRD1, WRSL)
  If (LNotEqual (WRSL, CNTR))
    { Return (0x31) }

  // Shift the bits to check the same
  ShiftLeft (WRD1, 1, WRD1)
  Increment (CNTR)
} // FindSetLeftBit check loop for Word data

// Check Word value for SetRightBit
Store (9, CNTR)
Store (0xFF00, WRD1)
While (LLessEqual (CNTR, 16))
{
  // FindSetRightBit check loop for Word data
  FindSetRightBit (WRD1, WRSL)
  If (LNotEqual (WRSL, CNTR))
    { Return (0x32) }

  ShiftLeft (WRD1, 1, WRD1)
  Increment (CNTR)
} // FindSetRightBit check loop for Word data

// Test the DWord value for SetLeftBit
Store (17, CNTR)
Store (0x10000, DWD1)
While (LLessEqual (CNTR, 32))
{
  // FindSetLeftBit check loop for Dword
  FindSetLeftBit (DWD1, DRSL)
  If (LNotEqual (DRSL, CNTR))

```

```

    { Return (0x41) }

    // Shift the bits to check the same
    ShiftLeft (DWD1, 1, DWD1)
    Increment (CNTR)
} // FindSetLeftBit check loop for Dword

// Check DWord value for SetRightBit
Store (17, CNTR)
Store (0xFFFF0000, DWD1)
While (LLessEqual (CNTR, 32))
{ // FindSetRightBit Check loop for DWORD
    FindSetRightBit (DWD1, DRSL)
    If (LNotEqual (DRSL, CNTR))
        { Return (0x42) }

    ShiftLeft (DWD1, 1, DWD1)
    Increment (CNTR)
} // FindSetRightBit Check loop for DWORD

Return (0)
} // SHFT

// Test method called from amlexec
Method (TEST)
{ // TEST

    Store ("+++++++ FdSetOps Test", Debug)

    Store (SHFT (0x80, 8), RSLT)
    If (LNotEqual (RSLT, 0))
        { Return (RSLT) }

    Return (0) // pass
} // TEST
} // Device FDSO

//
// test MulDivOp.asl
//
Device (MLDV)
{
    // create System Memory Operation Region and field overlays
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
    Field (RAM, AnyAcc, NoLock, Preserve)
    {
        SMDW, 32, // 32-bit DWORD
        SMWD, 16, // 16-bit WORD
    }
}

```

```

    SMBY, 8, // 8-bit BYTE
} // Field(RAM)

Method (TEST)
{
    Store ("+++++++ MulDivOp Test", Debug)

    Name (RMDR, 0)
    Name (DWRD, 0x12345678)
    Name (WRD, 0x1234)
    Name (BYT, 0x12)

    // Test MultiplyOp with DWORD data
    Store (0x12345678, DWRD)
    Multiply (DWRD, 3, DWRD)
    If (LNotEqual (DWRD, 0x369D0368))
        { Return (DWRD) }

    // Test MultiplyOp with WORD data
    Multiply (WRD, 4, WRD)
    If (LNotEqual (WRD, 0x48D0))
        { Return (WRD) }

    // Test MultiplyOp with BYTE data
    Multiply (BYT, 5, BYT)
    If (LNotEqual (BYT, 0x5A))
        { Return (BYT) }

    // Test DivideOp with DWORD data
    Divide (DWRD, 3, DWRD, RMDR)
    If (LNotEqual (DWRD, 0x12345678))
        { Return (DWRD) }
    If (LNotEqual (RMDR, 0))
        { Return (RMDR) }

    // Test DivideOp with WORD data
    Divide (WRD, 4, WRD, RMDR)
    If (LNotEqual (WRD, 0x1234))
        { Return (WRD) }
    If (LNotEqual (RMDR, 0))
        { Return (RMDR) }

    // Test DivideOp with BYTE data
    Divide (BYT, 5, BYT, RMDR)
    If (LNotEqual (BYT, 0x12))
        { Return (BYT) }
    If (LNotEqual (RMDR, 0))
        { Return (RMDR) }
}

```

```

// test MultiplyOp with DWORD SystemMemory OpRegion
Store (0x01234567, SMDW)
Multiply (SMDW, 2, SMDW)
If (LNotEqual (SMDW, 0x02468ACE))
    { Return (SMDW) }

// test DivideOp with DWORD SystemMemory OpRegion
Divide (SMDW, 3, SMDW, RMDR)
If (LNotEqual (SMDW, 0x00C22E44))
    { Return (SMDW) }
If (LNotEqual (RMDR, 2))
    { Return (RMDR) }

// test MultiplyOp with WORD SystemMemory OpRegion
Store (0x0123, SMWD)
Multiply (SMWD, 3, SMWD)
If (LNotEqual (SMWD, 0x369))
    { Return (SMWD) }

// test DivideOp with WORD SystemMemory OpRegion
Divide (SMWD, 2, SMWD, RMDR)
If (LNotEqual (SMWD, 0x01B4))
    { Return (SMWD) }
If (LNotEqual (RMDR, 1))
    { Return (RMDR) }

// test MultiplyOp with BYTE SystemMemory OpRegion
Store (0x01, SMBY)
Multiply (SMBY, 7, SMBY)
If (LNotEqual (SMBY, 0x07))
    { Return (SMBY) }

// test DivideOp with BYTE SystemMemory OpRegion
Divide (SMBY, 4, SMBY, RMDR)
If (LNotEqual (SMBY, 0x01))
    { Return (SMBY) }
If (LNotEqual (RMDR, 3))
    { Return (RMDR) }

Return (0)
} // TEST
} // MLDV

//

```

```

// test NBitOps.asl
//
//NAnd - Bit-wise NAnd
//NAndTerm := NAnd(
// Source1, //TermArg=>Integer
// Source2 //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source1 and Source2 are evaluated as integer data types, a bit-wise NAND is performed, and the result is
optionally
//stored in Result.

//NOr - Bitwise NOR
//NOrTerm := NOR(
// Source1, //TermArg=>Integer
// Source2 //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source1 and Source2 are evaluated as integer data types, a bit-wise NOR is performed, and the result is optionally
//stored in Result.

// Not - Not
//NotTerm := Not(
// Source, //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source1 is evaluated as an integer data type, a bit-wise NOT is performed, and the result is optionally stored in
//Result.

```

//If the Control method is success Zero is returned else a non-zero number is returned

Device (NBIT)

{//NBIT

//Create System Memory Operation Region and field overlays

OperationRegion (RAM, SystemMemory, 0x400000, 0x100)

Field (RAM, AnyAcc, NoLock, Preserve)

{

 SMDW, 32, // 32-bit DWORD

 SMWD, 16, // 16-bit WORD

 SMBY, 8, // 8-bit BYTE

}// Field(RAM)

//And with Byte Data

Name (BYT1, 0xff)

Name (BYT2, 0xff)

Name (BRSL, 0x00)

```
//And with Word Data
Name (WRD1, 0xffff)
Name (WRD2, 0xffff)
Name (WRSL, 0x0000)
```

```
//And with DWord Data
Name (DWD1, 0xffffffff)
Name (DWD2, 0xffffffff)
Name (DRSL, 0x00000000)
Name(RSLT,1)
```

```
Name(ARSL,0x00)
Name(LRSL,0x00)
```

```
Method(NNDB,2)
{/NNDB
```

```
Store(0xffffffff,SMDW)
Store(0xffff,SMWD)
Store(0xff,SMBY)
```

```
NAnd(Arg0,Arg1,ARSL)
if(LNotEqual(ARSL,0xffffffffd))
{Return(11)}
```

```
Store(Arg0,local0)
Store(Arg1,Local1)
```

```
NAnd(Local0,Local1,LRSL)
if(LNotEqual(LRSL,0xffffffffd))
{Return(12)}
```

```
//Byte data
NAnd(BYT1,BYT2,BRSL)
if(LNotEqual(BRSL,0xfffff00))
{Return(13)}
```

```
//Word Data
NAnd(WRD1,WRD2,WRSL)
if(LNotEqual(WRSL,0xffff0000))
{Return(14)}
```

```
//DWord Data
NAnd(DWD1,DWD2,DRSL)
if(LNotEqual(DRSL,0x00000000))
```

```

    {Return(15)}

    //Byte data
    NAnd(SMBY,0xff,BRSL)
    if(LNotEqual(BRSL,0xfffff00))
    {Return(16)}

    //Word Data
    NAnd(SMWD,0xffff,WDSL)
    if(LNotEqual(WDSL,0xffff0000))
    {Return(17)}

    //DWord Data
    NAnd(SMDW,0xffffffff,DRSL)
    if(LNotEqual(DRSL,0x00000000))
    {Return(18)}

    Return(0)

} //NNDB

Method(NNOR,2)
{ //NNOR

    NOr(Arg0,Arg1,ARSL)
    if(LNotEqual(ARSL,0xffffffd))
    {Return(21)}

    Store(Arg0,local0)
    Store(Arg1,Local1)

    NOr(Local0,Local1,LRSL)
    if(LNotEqual(LRSL,0xffffffd))
    {Return(22)}

    //Byte data
    NOr(BYT1,BYT2,BRSL)
    if(LNotEqual(BRSL,0xfffff00))
    {Return(23)}

    //Word Data
    NOr(WRD1,WRD2,WDSL)
    if(LNotEqual(WDSL,0xffff0000))
    {Return(24)}

    //DWord Data
    NOr(DWD1,DWD2,DRSL)

```



```

if(LNotEqual(DRSL,0x00000000))
  {Return(25)}

//System Memory Byte data
NOr(SMBY,0xff,BRSL)
if(LNotEqual(BRSL,0xfffff00))
  {Return(26)}

//System Memory Word Data
NOr(SMWD,0xffff,WDSL)
if(LNotEqual(WDSL,0xffff0000))
  {Return(27)}

//System Memory DWord Data
NOr(SMDW,0xffffffff,DRSL)
if(LNotEqual(DRSL,0x00000000))
  {Return(28)}

Return(0)

} //NNOR

Method(NNOT,2)
{ //NNOT

  Or(Arg0,Arg1,ARSL)
  Not(ARSL,ARSL)
  if(LNotEqual(ARSL,0xffffffd))
    {Return(31)}

  Store(Arg0,local0)
  Store(Arg1,Local1)

  Or(Local0,Local1,LDSL)
  Not(LDSL,LDSL)
  if(LNotEqual(LDSL,0xffffffd))
    {Return(32)}

  //Byte data
  Or(BYT1,BYT2,BRSL)
  Not(BRSL,BRSL)
  if(LNotEqual(BRSL,0xfffff00))
    {Return(33)}

  //Word Data
  Or(WRD1,WRD2,WDSL)
  Not(WDSL,WDSL)

```

```

if(LNotEqual(WRSL,0xffff0000))
  {Return(34)}

//DWord Data
Or(DWD1,DWD2,DRSL)
Not(DRSL,DRSL)
if(LNotEqual(DRSL,0x00000000))
  {Return(35)}

//System Memory Byte data
Or(SMBY,0xff,BRSL)
Not(BRSL,BRSL)
if(LNotEqual(BRSL,0xfffff00))
  {Return(36)}

//System Memory Word Data
Or(SMWD,0xffff,WRSL)
Not(WRSL,WRSL)
if(LNotEqual(WRSL,0xffff0000))
  {Return(37)}

//System Memory DWord Data
Or(SMDW,0xffffffff,DRSL)
Not(DRSL,DRSL)
if(LNotEqual(DRSL,0x00000000))
  {Return(38)}

Return(0)
} //NNOT

Method(TEST)
{

  Store ("+++++++ NBitOps Test", Debug)

  Store(NNDB(2,2),RSLT)
  if(LNotEqual(RSLT,0))
    {Return(RSLT)}

  Store(NNOR(2,2),RSLT)
  if(LNotEqual(RSLT,0))
    {Return(RSLT)}

  Store(NNOT(2,2),RSLT)
  if(LNotEqual(RSLT,0))
    {Return(RSLT)}
}

```

```

    Return(0)
}

} //Device NBIT

//
// test ShftOp.asl
//
//ShiftRightTerm := ShiftRight(
// Source, //TermArg=>Integer
// ShiftCount //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source and ShiftCount are evaluated as integer data types. Source is shifted right with the most significant bit
//zeroed ShiftCount times. The result is optionally stored into Result.

//ShiftLeft(
// Source, //TermArg=>Integer
// ShiftCount //TermArg=>Integer
// Result //Nothing | SuperName
//) => Integer
//Source and ShiftCount are evaluated as integer data types. Source is shifted left with the least significant
//bit zeroed ShiftCount times. The result is optionally stored into Result.

//If the Control method is success Zero is returned else a non-zero number is returned
Device (SHFT)
{ //SHFT

    //Create System Memory Operation Region and field overlays
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
    Field (RAM, AnyAcc, NoLock, Preserve)
    {
        SMDW, 32, // 32-bit DWORD
        SMWD, 16, // 16-bit WORD
        SMBY, 8, // 8-bit BYTE
    } // Field(RAM)

    Name(SHFC, 0x00)

    //And with Byte Data
    Name (BYT1, 0xff)
    Name (BRSL, 0x00)

    //And with Word Data
    Name (WRD1, 0xffff)
    Name (WRS�, 0x0000)

```

```

//And with DWord Data
Name (DWD1, 0xffffffff)
Name (DRSL, 0x00000000)

Name(RSLT,1)

Name(ARSL,0x00)
Name(LRSL,0x00)

Method(SLFT,2)
{//SLFT

    Store(0xffffffff,SMDW)
    Store(0xffff,SMWD)
    Store(0xff,SMBY)

    //Arg0-> 2 & Arg1->2
    ShiftLeft(Arg0,Arg1,ARSL)
    if(LNotEqual(ARSL,8))
    {Return(11)}

    Store(Arg0,local0)
    Store(Arg1,Local1)

    //Local0->8 and Local1->2
    ShiftLeft(Local0,Local1,LRSL)
    if(LNotEqual(LRSL,8))
    {Return(12)}

    Store(2,SHFC)
    //Byte data
    ShiftLeft(BYT1,SHFC,BRSL)
    if(LNotEqual(BRSL,0x3FC))
    {Return(13)}

    Store(4,SHFC)
    //Word Data
    ShiftLeft(WRD1,SHFC,WRSL)
    if(LNotEqual(WRSL,0xFFFF0))
    {Return(14)}

    Store(8,SHFC)
    //DWord Data
    ShiftLeft(DWD1,SHFC,DRSL)
    if(LNotEqual(DRSL,0xFFFFFFFF0))
    {Return(15)}

```

```

//System Memory Byte data
Store(4,SHFC)
ShiftLeft(SMBY,SHFC,BRSL)
if(LNotEqual(BRSL,0xFF0))
{Return(16)}

//Word Data
Store(4,SHFC)
ShiftLeft(SMWD,SHFC,WRSL)
if(LNotEqual(WRSL,0xffff0))
{Return(17)}

//DWord Data
Store(8,SHFC)
ShiftLeft(SMDW,SHFC,DRSL)
if(LNotEqual(DRSL,0xFFFFFFFF0))
{Return(18)}

Return(0)

} //SLFT

Method(SRGT,2)
{ //SRGT
//And with Byte Data
Store(0xff,BYT1)
Store(0x00,BRSL)

//And with Word Data
Store(0xffff,WRD1)
Store(0x0000,WRSL)

//And with DWord Data
Store(0xffffffff,DWD1)
Store(0x00000000,DRSL)

//Reinitialize the result objects
Store(0x00,ARSL)
Store(0x00,LRSL)

Store(0xffffffff,SMDW)
Store(0xffff,SMWD)
Store(0xff,SMBY)

//Arg0-> 2 & Arg1->2
ShiftRight(Arg0,Arg1,ARSL)

```

```

if(LNotEqual(ARSL,0))
{Return(21)}

Store(Arg0,local0)
Store(Arg1,Local1)

//Local0->8 and Local1->2
ShiftRight(Local0,Local1,LRSL)
  if(LNotEqual(LRSL,0))
  {Return(22)}

Store(2,SHFC)
//Byte data
ShiftRight(BYT1,SHFC,BRSL)
if(LNotEqual(BRSL,0x3F))
  {Return(23)}

Store(4,SHFC)
//Word Data
ShiftRight(WRD1,SHFC,WRSL)
if(LNotEqual(WRSL,0xFFF))
  {Return(24)}

Store(8,SHFC)
//DWord Data
ShiftRight(DWD1,SHFC,DRSL)
if(LNotEqual(DRSL,0xFFFFFFFF))
  {Return(25)}

//System Memory Byte data
Store(4,SHFC)
ShiftRight(SMBY,SHFC,BRSL)
if(LNotEqual(BRSL,0xF))
  {Return(26)}

//Word Data
Store(4,SHFC)
ShiftRight(SMWD,SHFC,WRSL)
if(LNotEqual(WRSL,0xFFF))
  {Return(27)}

//DWord Data
Store(8,SHFC)
ShiftRight(SMDW,SHFC,DRSL)
if(LNotEqual(DRSL,0xFFFFFFFF))
  {Return(28)}

Return(0)

```

```

} //SRGT

//Test method called from amlexec
Method(TEST)
{
    Store ("+++++++ ShftOp Test", Debug)

    Store(SLFT(2,2),RSLT)
    if(LNotEqual(RSLT,0))
        {Return(RSLT)}
    Store(SRGT(2,2),RSLT)
    if(LNotEqual(RSLT,0))
        {Return(RSLT)}
    Return(0)
}

} //Device SHFT

//
// test Xor.asl and slightly modified
//
//This code tests the XOR opcode term
//Syntax of XOR term
//    XOr(
//        Source1 //TermArg=>BufferTerm
//        Source2 //TermArg=>Integer
//        Result //NameString
//    )
//"Source1" and "Source2" are evaluated as integers, a bit-wise XOR is performed, and the result is optionally stored
in
// Result
Device (XORD)
{
    //This Method tests XOr operator for all the data types i.e. BYTE, WORD and DWORD
    Method (TEST)
    {
        Store ("+++++++ Xor Test", Debug)

        //Overlay in system memory
        OperationRegion (RAM, SystemMemory, 0x800000, 256)
        Field (RAM, ByteAcc, NoLock, Preserve)
        {
            RES1, 1, //Offset
            BYT1, 8, //First BYTE
            BYT2, 8, //Second BYTE
            RBYT, 8, //Result Byte
            RES2, 1, //Offset
            WRD1, 16, //First WORD field

```

```

WRD2, 16, //Second WORD field
RWRD, 16, //RSLT WORD field
RES3, 1, //Offset
DWD1, 32, //First Dword
DWD2, 32, //Second Dword
RDWD, 32, //Result Dword
RES4, 1, //Offset
}

// Store bits in the single bit fields for checking
// at the end
Store(1, RES1)
Store(1, RES2)
Store(1, RES3)
Store(1, RES4)

// Check the stored single bits
if(LNotEqual(RES1, 1))
{
    Return(1)
}

if(LNotEqual(RES2, 1))
{
    Return(1)
}

if(LNotEqual(RES3, 1))
{
    Return(1)
}

if(LNotEqual(RES4, 1))
{
    Return(1)
}

//*****
// (BYT1) Bit1 ->0 and (BYT2)Bit2 -> 0 condition
Store(0x00,BYT1)
Store(0x00,BYT2)
XOr(BYT1,BYT2,Local0)
Store (Local0, RBYT)
if(LNotEqual(RBYT,0))
{ Return(1)}

// (BYT1) Bit1 ->1 and (BYT2)Bit2 -> 1 condition
Store(0xff,BYT1)

```



```

Store(0xff,BYT2)
XOr(BYT1,BYT2,Local0)
Store (Local0, RBYT)
if(LNotEqual(RBYT,0))
{ Return(1)}

// (BYT1) Bit1 ->1 and (BYT)Bit2 -> 0 condition
Store(0x55,BYT1)
Store(0xAA,BYT2)
XOr(BYT1,BYT2,Local0)
Store (Local0, RBYT)
if(LNotEqual(RBYT,0xFF))
{ Return(1)}

//(BYT1) Bit1 ->0 and (BYT2)Bit2 -> 1 condition
Store(0xAA,BYT1)
Store(0x55,BYT2)
XOr(BYT1,BYT2,Local0)
Store (Local0, RBYT)
if(LNotEqual(RBYT,0xFF))
{ Return(1)}

Store(0x12,BYT1)
Store(0xED,BYT2)

XOr(BYT1,BYT2,Local0)
Store (Local0, RBYT)
if(LNotEqual(RBYT,0xFF))
{
Return(1)
}

// Store known values for checking later
Store(0x12, BYT1)
if(LNotEqual(BYT1, 0x12))
{
Return(1)
}

Store(0xFE, BYT2)
if(LNotEqual(BYT2, 0xFE))
{
Return(1)
}

Store(0xAB, RBYT)
if(LNotEqual(RBYT, 0xAB))
{

```

```

    Return(1)
}

//*****
// (WRD1) Bit1 ->0 and (WRD2)Bit2 -> 0 condition
Store(0x0000,WRD1)
Store(0x0000,WRD2)
XOr(WRD1,WRD2,RWRD)
if(LNotEqual(RWRD,0))
{ Return(1)}

// (WRD1) Bit1 ->1 and (WRD2)Bit2 -> 1 condition
Store(0xffff,WRD1)
Store(0xffff,WRD2)
XOr(WRD1,WRD2,RWRD)
if(LNotEqual(RWRD,0))
{ Return(1)}

// (WRD1) Bit1 ->1 and (WRD2)Bit2 -> 0 condition
Store(0x5555,WRD1)
Store(0xAAAA,WRD2)
XOr(WRD1,WRD2,RWRD)
if(LNotEqual(RWRD,0xFFFF))
{ Return(1)}

//(WRD1) Bit1 ->0 and (WRD2)Bit2 -> 1 condition
Store(0xAAAA,WRD1)
Store(0x5555,WRD2)
XOr(WRD1,WRD2,RWRD)
if(LNotEqual(RWRD,0xFFFF))
{ Return(1)}

Store(0x1234,WRD1)
Store(0xEDCB,WRD2)
XOr(WRD1,WRD2,RWRD)
if(LNotEqual(RWRD,0xFFFF))
{ Return(1)}

// Store known values for checking later
Store(0x1234, WRD1)
if(LNotEqual(WRD1, 0x1234))
{
    Return(1)
}

Store(0xFEDC, WRD2)
if(LNotEqual(WRD2, 0xFEDC))
{

```

```

Return(1)
}

Store(0x87AB, RWRD)
if(LNotEqual(RWRD, 0x87AB))
{
Return(1)
}

//*****
// (DWD1) Bit1 ->0 and (DWD2)Bit2 -> 0 condition
Store(0x00000000,DWD1)
Store(0x00000000,DWD2)
XOr(DWD1,DWD2,RDWD)
if(LNotEqual(RDWD,0))
{ Return(1)}

// (DWD1) Bit1 ->1 and (DWD2)Bit2 -> 1 condition
Store(0xffffffff,DWD1)
Store(0xffffffff,DWD2)
XOr(DWD1,DWD2,RDWD)
if(LNotEqual(RDWD,0))
{ Return(1)}

// (DWD1) Bit1 ->1 and (DWD2)Bit2 -> 0 condition
Store(0x55555555,DWD1)
Store(0xAAAAAAAA,DWD2)
XOr(DWD1,DWD2,RDWD)
if(LNotEqual(RDWD,0xFFFFFFFF))
{ Return(1)}

//(DWD1) Bit1 ->0 and (DWD2)Bit2 -> 1 condition
Store(0xAAAAAAAA,DWD1)
Store(0x55555555,DWD2)
XOr(DWD1,DWD2,RDWD)
if(LNotEqual(RDWD,0xFFFFFFFF))
{ Return(1)}

// (DWD1) Bit1 ->1 and (DWD2)Bit2 -> 0 condition
Store(0x12345678,DWD1)
Store(0xEDCBA987,DWD2)
XOr(DWD1,DWD2,RDWD)
if(LNotEqual(RDWD,0xFFFFFFFF))
{ Return(1)}

Store(0x12345678,DWD1)
if(LNotEqual(DWD1,0x12345678))

```

```

{
    Return(1)
}

Store(0xFEDCBA98,DWD2)
if(LNotEqual(DWD2,0xFEDCBA98))
{
    Return(1)
}

Store(0x91827364,RDWD)
if(LNotEqual(RDWD,0x91827364))
{
    Return(1)
}

//*****
// Check the stored single bits
if(LNotEqual(RES1, 1))
{
    Return(1)
}

if(LNotEqual(RES2, 1))
{
    Return(1)
}

if(LNotEqual(RES3, 1))
{
    Return(1)
}

if(LNotEqual(RES4, 1))
{
    Return(1)
}

// Change all of the single bit fields to zero
Store(0, RES1)
Store(0, RES2)
Store(0, RES3)
Store(0, RES4)

// Now, check all of the fields

// Byte
if(LNotEqual(BYT1, 0x12))

```

```
{
    Return(1)
}

if(LNotEqual(BYT2, 0xFE))
{
    Return(1)
}

if(LNotEqual(RBYT, 0xAB))
{
    Return(1)
}

// Word
if(LNotEqual(WRD1, 0x1234))
{
    Return(1)
}

if(LNotEqual(WRD2, 0xFEDC))
{
    Return(1)
}

if(LNotEqual(RWRD, 0x87AB))
{
    Return(1)
}

// Dword
if(LNotEqual(DWD1, 0x12345678))
{
    Return(1)
}

if(LNotEqual(DWD2, 0xFEDCBA98))
{
    Return(1)
}

if(LNotEqual(RDWD, 0x91827364))
{
    Return(1)
}

// Bits
if(LNotEqual(RES1, 0))
```

```

    {
        Return(1)
    }

if(LNotEqual(RES2, 0))
{
    Return(1)
}

if(LNotEqual(RES3, 0))
{
    Return(1)
}

if(LNotEqual(RES4, 0))
{
    Return(1)
}

Return(0)
} // TEST
} // XORD

//
// test CrBytFld.asl
//
// CrBytFld test
// Test for CreateByteField.
// Tests creating byte field overlay of buffer stored in Local0.
// Tests need to be added for Arg0 and Name buffers.
//
Device (CRBF)
{ // Test device name
Method (TEST)
{
    Store ("+++++++ CrBytFld Test", Debug)

    // Local0 is uninitialized buffer with 4 elements
    Store (Buffer (4) {}, Local0)

    // create Byte Field named BF0 based on Local0 element 0
    CreateByteField (Local0, 0, BF0)

    // validate CreateByteField did not alter Local0
    Store (ObjectType (Local0), Local1) // Local1 = Local0 object type
    If (LNotEqual (Local1, 3)) // Buffer object type value is 3
        { Return (2) }
}
}

```

```

// store something into BF0
Store (1, BF0)

// validate Store did not alter Local0 object type
Store (ObjectType (Local0), Local1) // Local1 = Local0 object type
If (LNotEqual (Local1, 3)) // Buffer object type value is 3
    { Return (3) }

// verify that the Store into BF0 was successful
If (LNotEqual (BF0, 1))
    { Return (4) }

// create Byte Field named BF1 based on Local0 element 1
CreateByteField (Local0, 1, BF1)

// validate CreateByteField did not alter Local0
Store (ObjectType (Local0), Local1) // Local1 = Local0 object type
If (LNotEqual (Local1, 3)) // Buffer object type value is 3
    { Return (10) }

// store something into BF1
Store (5, BF1)

// validate Store did not alter Local0 object type
Store (ObjectType (Local0), Local1) // Local1 = Local0 object type
If (LNotEqual (Local1, 3)) // Buffer object type value is 3
    { Return (11) }

// verify that the Store into BF1 was successful
If (LNotEqual (BF1, 5))
    { Return (12) }

// verify that the Store into BF1 did not alter BF0
If (LNotEqual (BF0, 1))
    { Return (13) }

// store something into BF0
Store (0xFFFF, BF0)

// verify that the Store into BF0 was successful
If (LNotEqual (BF0, 0xFF))
    { Return (20) }

// verify that the Store into BF0 did not alter BF1
If (LNotEqual (BF1, 5))

```

```

    { Return (21) }

Return (0)
} // TEST
} // CRBF

//
// test IndexOp4.asl
//
// IndexOp4 test
// This is just a subset of the many RegionOp/Index Field test cases.
// Tests access of index fields smaller than 8 bits.
//
Device (IDX4)
{ // Test device name

// MADM: Misaligned Dynamic RAM SystemMemory OperationRegion
// Tests OperationRegion memory access using misaligned BYTE,
// WORD, and DWORD field element accesses. Validation is performed
// using both misaligned field entries and aligned field entries.
//
// MADM returns 0 if all test cases pass or non-zero identifying
// the failing test case for debug purposes. This non-zero numbers
// are not guaranteed to be in perfect sequence (i.e., test case
// index), but are guaranteed to be unique so the failing test
// case can be uniquely identified.
//
Method (MADM, 1) // Misaligned Dynamic RAM SystemMemory OperationRegion
// Arg0 -- SystemMemory OperationRegion base address
{ // MADM: Misaligned Dynamic RAM SystemMemory OperationRegion
  OperationRegion (RAM, SystemMemory, Arg0, 0x100)
  Field (RAM, DwordAcc, NoLock, Preserve)
  { // aligned field definition (for verification)
    DWD0, 32, // aligned DWORD field
    DWD1, 32 // aligned DWORD field
  }
  Field (RAM, ByteAcc, NoLock, Preserve)
  { // bit access field definition
    BIT0, 1, // single bit field entry
    BIT1, 1, // single bit field entry
    BIT2, 1, // single bit field entry
    BIT3, 1, // single bit field entry
    BIT4, 1, // single bit field entry
    BIT5, 1, // single bit field entry
    BIT6, 1, // single bit field entry
    BIT7, 1, // single bit field entry
    BIT8, 1, // single bit field entry
  }
}

```



```

BIT9, 1, // single bit field entry
BITA, 1, // single bit field entry
BITB, 1, // single bit field entry
BITC, 1, // single bit field entry
BITD, 1, // single bit field entry
BITE, 1, // single bit field entry
BITF, 1, // single bit field entry
BI10, 1, // single bit field entry
BI11, 1, // single bit field entry
BI12, 1, // single bit field entry
BI13, 1, // single bit field entry
BI14, 1, // single bit field entry
BI15, 1, // single bit field entry
BI16, 1, // single bit field entry
BI17, 1, // single bit field entry
BI18, 1, // single bit field entry
BI19, 1, // single bit field entry
BI1A, 1, // single bit field entry
BI1B, 1, // single bit field entry
BI1C, 1, // single bit field entry
BI1D, 1, // single bit field entry
BI1E, 1, // single bit field entry
BI1F, 1 // single bit field entry
} // bit access field definition

```

Field (RAM, ByteAcc, NoLock, Preserve)

```

{ // two-bit access field definition
B2_0, 2, // single bit field entry
B2_1, 2, // single bit field entry
B2_2, 2, // single bit field entry
B2_3, 2, // single bit field entry
B2_4, 2, // single bit field entry
B2_5, 2, // single bit field entry
B2_6, 2, // single bit field entry
B2_7, 2, // single bit field entry
B2_8, 2, // single bit field entry
B2_9, 2, // single bit field entry
B2_A, 2, // single bit field entry
B2_B, 2, // single bit field entry
B2_C, 2, // single bit field entry
B2_D, 2, // single bit field entry
B2_E, 2, // single bit field entry
B2_F, 2 // single bit field entry
} // bit access field definition

```

// initialize memory contents using aligned field entries

Store (0x5AA55AA5, DWD0)

Store (0x5AA55AA5, DWD1)

```

// set memory contents to known values using misaligned field entries
Store (0, BIT0)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BIT0, 0))
    { Return (1) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA55AA4))
    { Return (2) }

// set memory contents to known values using misaligned field entries
Store (1, BIT1)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BIT1, 1))
    { Return (3) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA55AA6))
    { Return (4) }

// set memory contents to known values using misaligned field entries
Store (0, BIT2)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BIT2, 0))
    { Return (5) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA55AA2))
    { Return (6) }

// set memory contents to known values using misaligned field entries
Store (1, BIT3)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BIT3, 1))
    { Return (7) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA55AAA))
    { Return (8) }

// set memory contents to known values using misaligned field entries
Store (1, BIT4)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BIT4, 1))
    { Return (9) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA55ABA))
    { Return (10) }

// set memory contents to known values using misaligned field entries
Store (0, BIT5)

```

```

// verify memory contents using misaligned field entries
If (LNotEqual (BIT5, 0))
    { Return (11) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA55A9A))
    { Return (12) }

// set memory contents to known values using misaligned field entries
Store (1, BIT6)
// verify memory contents using misaligned field entries
If (LNotEqual (BIT6, 1))
    { Return (13) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA55ADA))
    { Return (14) }

// set memory contents to known values using misaligned field entries
Store (0, BIT7)
// verify memory contents using misaligned field entries
If (LNotEqual (BIT7, 0))
    { Return (15) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA55A5A))
    { Return (16) }

// set memory contents to known values using misaligned field entries
Store (1, BIT8)
// verify memory contents using misaligned field entries
If (LNotEqual (BIT8, 1))
    { Return (17) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA55B5A))
    { Return (18) }

// set memory contents to known values using misaligned field entries
Store (0, BIT9)
// verify memory contents using misaligned field entries
If (LNotEqual (BIT9, 0))
    { Return (19) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA5595A))
    { Return (20) }

// set memory contents to known values using misaligned field entries
Store (1, BITA)
// verify memory contents using misaligned field entries
If (LNotEqual (BITA, 1))
    { Return (21) }

```

```

// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA55D5A))
    { Return (22) }

// set memory contents to known values using misaligned field entries
Store (0, BITB)
// verify memory contents using misaligned field entries
If (LNotEqual (BITB, 0))
    { Return (23) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA5555A))
    { Return (24) }

// set memory contents to known values using misaligned field entries
Store (0, BITC)
// verify memory contents using misaligned field entries
If (LNotEqual (BITC, 0))
    { Return (25) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA5455A))
    { Return (26) }

// set memory contents to known values using misaligned field entries
Store (1, BITD)
// verify memory contents using misaligned field entries
If (LNotEqual (BITD, 1))
    { Return (27) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA5655A))
    { Return (28) }

// set memory contents to known values using misaligned field entries
Store (0, BITE)
// verify memory contents using misaligned field entries
If (LNotEqual (BITE, 0))
    { Return (29) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA5255A))
    { Return (30) }

// set memory contents to known values using misaligned field entries
Store (1, BITF)
// verify memory contents using misaligned field entries
If (LNotEqual (BITF, 1))
    { Return (31) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5AA5A55A))
    { Return (32) }

```

```

// set memory contents to known values using misaligned field entries
Store (0, BI10)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BI10, 0))
    { Return (33) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA4A55A))
    { Return (34) }

// set memory contents to known values using misaligned field entries
Store (1, BI11)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BI11, 1))
    { Return (35) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA6A55A))
    { Return (36) }

// set memory contents to known values using misaligned field entries
Store (0, BI12)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BI12, 0))
    { Return (37) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AA2A55A))
    { Return (38) }

// set memory contents to known values using misaligned field entries
Store (1, BI13)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BI13, 1))
    { Return (39) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5AAAA55A))
    { Return (40) }

// set memory contents to known values using misaligned field entries
Store (1, BI14)
  // verify memory contents using misaligned field entries
  If (LNotEqual (BI14, 1))
    { Return (41) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0x5ABAA55A))
    { Return (42) }

// set memory contents to known values using misaligned field entries
Store (0, BI15)

```

```

// verify memory contents using misaligned field entries
If (LNotEqual (BI15, 0))
    { Return (43) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5A9AA55A))
    { Return (44) }

// set memory contents to known values using misaligned field entries
Store (1, BI16)
// verify memory contents using misaligned field entries
If (LNotEqual (BI16, 1))
    { Return (45) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5ADAA55A))
    { Return (46) }

// set memory contents to known values using misaligned field entries
Store (0, BI17)
// verify memory contents using misaligned field entries
If (LNotEqual (BI17, 0))
    { Return (47) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5A5AA55A))
    { Return (48) }

// set memory contents to known values using misaligned field entries
Store (1, BI18)
// verify memory contents using misaligned field entries
If (LNotEqual (BI18, 1))
    { Return (49) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5B5AA55A))
    { Return (50) }

// set memory contents to known values using misaligned field entries
Store (0, BI19)
// verify memory contents using misaligned field entries
If (LNotEqual (BI19, 0))
    { Return (51) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x595AA55A))
    { Return (52) }

// set memory contents to known values using misaligned field entries
Store (1, BI1A)
// verify memory contents using misaligned field entries
If (LNotEqual (BI1A, 1))
    { Return (53) }

```

```

// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x5D5AA55A))
    { Return (54) }

// set memory contents to known values using misaligned field entries
Store (0, BI1B)
// verify memory contents using misaligned field entries
If (LNotEqual (BI1B, 0))
    { Return (55) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x555AA55A))
    { Return (56) }

// set memory contents to known values using misaligned field entries
Store (0, BI1C)
// verify memory contents using misaligned field entries
If (LNotEqual (BI1C, 0))
    { Return (57) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x455AA55A))
    { Return (58) }

// set memory contents to known values using misaligned field entries
Store (1, BI1D)
// verify memory contents using misaligned field entries
If (LNotEqual (BI1D, 1))
    { Return (59) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x655AA55A))
    { Return (60) }

// set memory contents to known values using misaligned field entries
Store (0, BI1E)
// verify memory contents using misaligned field entries
If (LNotEqual (BI1E, 0))
    { Return (61) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x255AA55A))
    { Return (62) }

// set memory contents to known values using misaligned field entries
Store (1, BI1F)
// verify memory contents using misaligned field entries
If (LNotEqual (BI1F, 1))
    { Return (63) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0xA55AA55A))
    { Return (64) }

```

```

// set memory contents to known values using misaligned field entries
Store (3, B2_0)
  // verify memory contents using misaligned field entries
  If (LNotEqual (B2_0, 3))
    { Return (65) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0xA55AA55B))
    { Return (66) }

// set memory contents to known values using misaligned field entries
Store (1, B2_1)
  // verify memory contents using misaligned field entries
  If (LNotEqual (B2_1, 1))
    { Return (67) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0xA55AA557))
    { Return (68) }

// set memory contents to known values using misaligned field entries
Store (0, B2_2)
  // verify memory contents using misaligned field entries
  If (LNotEqual (B2_2, 0))
    { Return (69) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0xA55AA547))
    { Return (70) }

// set memory contents to known values using misaligned field entries
Store (3, B2_3)
  // verify memory contents using misaligned field entries
  If (LNotEqual (B2_3, 3))
    { Return (71) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0xA55AA5C7))
    { Return (72) }

// set memory contents to known values using misaligned field entries
Store (3, B2_4)
  // verify memory contents using misaligned field entries
  If (LNotEqual (B2_4, 3))
    { Return (73) }
  // verify memory contents using aligned field entries
  If (LNotEqual (DWD0, 0xA55AA7C7))
    { Return (74) }

// set memory contents to known values using misaligned field entries

```



```

Store (0, B2_5)
    // verify memory contents using misaligned field entries
    If (LNotEqual (B2_5, 0))
        { Return (75) }
    // verify memory contents using aligned field entries
    If (LNotEqual (DWD0, 0xA55AA3C7))
        { Return (76) }

// set memory contents to known values using misaligned field entries
Store (1, B2_6)
    // verify memory contents using misaligned field entries
    If (LNotEqual (B2_6, 1))
        { Return (77) }
    // verify memory contents using aligned field entries
    If (LNotEqual (DWD0, 0xA55A93C7))
        { Return (78) }

// set memory contents to known values using misaligned field entries
Store (1, B2_7)
    // verify memory contents using misaligned field entries
    If (LNotEqual (B2_7, 1))
        { Return (79) }
    // verify memory contents using aligned field entries
    If (LNotEqual (DWD0, 0xA55A53C7))
        { Return (80) }

// set memory contents to known values using misaligned field entries
Store (0, B2_8)
    // verify memory contents using misaligned field entries
    If (LNotEqual (B2_8, 0))
        { Return (81) }
    // verify memory contents using aligned field entries
    If (LNotEqual (DWD0, 0xA55853C7))
        { Return (82) }

// set memory contents to known values using misaligned field entries
Store (1, B2_9)
    // verify memory contents using misaligned field entries
    If (LNotEqual (B2_9, 1))
        { Return (83) }
    // verify memory contents using aligned field entries
    If (LNotEqual (DWD0, 0xA55453C7))
        { Return (84) }

// set memory contents to known values using misaligned field entries
Store (2, B2_A)
    // verify memory contents using misaligned field entries
    If (LNotEqual (B2_A, 2))

```

```

    { Return (85) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0xA56453C7))
    { Return (86) }

// set memory contents to known values using misaligned field entries
Store (2, B2_B)
// verify memory contents using misaligned field entries
If (LNotEqual (B2_B, 2))
    { Return (87) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0xA5A453C7))
    { Return (88) }

// set memory contents to known values using misaligned field entries
Store (3, B2_C)
// verify memory contents using misaligned field entries
If (LNotEqual (B2_C, 3))
    { Return (89) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0xA7A453C7))
    { Return (90) }

// set memory contents to known values using misaligned field entries
Store (3, B2_D)
// verify memory contents using misaligned field entries
If (LNotEqual (B2_D, 3))
    { Return (91) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0xAFA453C7))
    { Return (92) }

// set memory contents to known values using misaligned field entries
Store (1, B2_E)
// verify memory contents using misaligned field entries
If (LNotEqual (B2_E, 1))
    { Return (93) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x9FA453C7))
    { Return (94) }

// set memory contents to known values using misaligned field entries
Store (0, B2_F)
// verify memory contents using misaligned field entries
If (LNotEqual (B2_F, 0))
    { Return (95) }
// verify memory contents using aligned field entries
If (LNotEqual (DWD0, 0x1FA453C7))

```

```

    { Return (96) }

Return (0) // pass
} // MADM: Misaligned Dynamic RAM SystemMemory OperationRegion

Method (TEST)
{
    Store ("+++++++ IndexOp4 Test", Debug)

    // MADM (Misaligned Dynamic RAM SystemMemory OperationRegion) arguments:
    // Arg0 -- SystemMemory OperationRegion base address
    Store (MADM (0x800000), Local0)
    If (LNotEqual (Local0, 0)) // MADM returns zero if successful
        { Return (Local0) } // failure: return MADM error code

    Return (Local0)
} // TEST
} // IDX4

//
// test Event.asl
//
// EventOp, ResetOp, SignalOp, and WaitOp test cases.
//
Device (EVNT)
{
    Event (EVNT) // event synchronization object

    Method (TEVN, 1)
    // Arg0: time to Wait for event in milliseconds
    { // TEVN control method to test ResetOp, SignalOp, and WaitOp
        // reset EVNT to initialization (zero) state
        Reset (EVNT)

        // prime EVNT with two outstanding signals
        Signal (EVNT)
        Signal (EVNT)

        // acquire existing signal
        Store (Wait (EVNT, Arg0), Local0)

        // validate Local0 is a Number
        Store (ObjectType (Local0), Local1)
        If (LNotEqual (Local1, 1)) // Number is type 1
            { Return (0x21) } // Local1 indicates Local0 is not a Number
    }
}

```

```

If (LNotEqual (Local0, 0)) // Number is type 1
    { Return (0x22) } // timeout occurred without acquiring signal

Store ("Acquire 1st existing signal PASS", Debug)

// acquire existing signal
Store (Wait (EVNT, Arg0), Local0)

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
    { Return (0x31) } // Local1 indicates Local0 is not a Number

If (LNotEqual (Local0, 0)) // Number is type 1
    { Return (0x32) } // timeout occurred without acquiring signal

Store ("Acquire 2nd existing signal PASS", Debug)

// ensure WaitOp timeout test cases do not hang
if (LEqual (Arg0, 0xFFFF))
    { Store (0xFFFE, Arg0) }

// acquire non-existing signal
Store (Wait (EVNT, Arg0), Local0)

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
    { Return (0x41) } // Local1 indicates Local0 is not a Number

If (LEqual (Local0, 0)) // Number is type 1
    { Return (0x42) } // non-existent signal was acquired

Store ("Acquire signal timeout PASS", Debug)

// prime EVNT with two outstanding signals
Signal (EVNT)
Signal (EVNT)

// reset EVNT to initialization (zero) state
Reset (EVNT)

// acquire non-existing signal
Store (Wait (EVNT, Arg0), Local0)

```

```

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
    { Return (0x51) } // Local1 indicates Local0 is not a Number

If (LEqual (Local0, 0)) // Number is type 1
    { Return (0x52) } // non-existent signal was acquired

Store ("Reset signal PASS", Debug)

// acquire non-existing signal using Lvalue timeout
Store (Wait (EVNT, Zero), Local0)

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
    { Return (0x61) } // Local1 indicates Local0 is not a Number

If (LEqual (Local0, 0)) // Number is type 1
    { Return (0x62) } // non-existent signal was acquired

Store ("Zero Lvalue PASS", Debug)

// acquire non-existing signal using Lvalue timeout
Store (Wait (EVNT, One), Local0)

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
    { Return (0x71) } // Local1 indicates Local0 is not a Number

If (LEqual (Local0, 0)) // Number is type 1
    { Return (0x72) } // non-existent signal was acquired

Store ("One Lvalue PASS", Debug)

// Lvalue Event test cases
// ILLEGAL SOURCE OPERAND Store (EVNT, Local2)

// validate Local2 is an Event
Store (ObjectType (EVNT), Local1)
If (LNotEqual (Local1, 7)) // Event is type 7
    { Return (0x81) } // Local1 indicates Local0 is not a Number

// reset EVNT to initialization (zero) state
Reset (EVNT)

```

```

// prime EVNT with two outstanding signals
Signal (EVNT)

// acquire existing signal
Store (Wait (EVNT, Arg0), Local0)

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
  { Return (0x82) } // Local1 indicates Local0 is not a Number

If (LNotEqual (Local0, 0)) // Number is type 1
  { Return (0x83) } // timeout occurred without acquiring signal

Store ("Acquire Lvalue existing signal PASS", Debug)

// acquire non-existing signal
Store (Wait (EVNT, Arg0), Local0)

// validate Local0 is a Number
Store (ObjectType (Local0), Local1)
If (LNotEqual (Local1, 1)) // Number is type 1
  { Return (0x84) } // Local1 indicates Local0 is not a Number

If (LEqual (Local0, 0)) // Number is type 1
  { Return (0x85) } // non-existent signal was acquired

Store ("Acquire Lvalue signal timeout PASS", Debug)

Return (0) // success
} // TEVN control method to test ResetOp, SignalOp, and WaitOp

Method (TEST)
{
  Store ("+++++++ Event Test", Debug)

  Store (TEVN (100), Local0)

  Return (Local0)
} // TEST
} // EVNT

//
// test SizeOfLv.asl
//

```

```

// Test for SizeOf (Lvalue)
//
// This next section will contain the packages that the SizeOfOp will be
// exercised on. The first one, PKG0, is a regular package of 3 elements.
// The 2nd one, PKG1, is a nested package with 3 packages inside it, each
// with 3 elements. It is expected that SizeOf operator will return the
// same value for these two packages since they both have 3 elements. The
// final package, PKG2, has 4 elements and the SizeOf operator is expected
// to return different results for this package.

Name (PKG0,
    Package (3)
        {0x0123, 0x4567, 0x89AB}
) // PKG0

Name (PKG1,
    Package (3)
        {
            Package (3) {0x0123, 0x4567, 0x89AB},
            Package (3) {0xCDEF, 0xFEDC, 0xBA98},
            Package (3) {0x7654, 0x3210, 0x1234}
        }
) // PKG1

Name (PKG2,
    Package (4)
        {0x0123, 0x4567, 0x89AB, 0x8888}
) // PKG2

Name (PKG3,
    Package (5)
        {0x0123, 0x4567, 0x89AB, 0x8888, 0x7777}
) // PKG3

// End Packages *****

// The following section will declare the data strings that will be used to
// exercise the SizeOf operator. STR0 and STR1 are expected to be equal,
// STR2 is expected to have a different SizeOf value than STR0 and STR1.

Name (STR0, "ACPI permits very flexible methods of expressing a system")

Name (STR1, "MIKE permits very flexible methods of expressing a system")

Name (STR2, "Needless to say, Mike and ACPI are frequently at odds")

// This string is being made in case we want to do a SizeOf comparison
// between strings and packages or buffers

```

```

Name (STR3, "12345")

// End Strings *****

// The following section will declare the buffers that will be used to exercise
// the SizeOf operator.

Name (BUF0, Buffer (10) {})
Name (BUF1, Buffer (10) {})
Name (BUF2, Buffer (8) {})
Name (BUF3, Buffer (5) {})

// End Buffers *****
Device (SZLV)
{

    Method (CMPR, 2)
    {
        // CMPR is passed two arguments. If unequal, return 1 to indicate
        // that, otherwise return 0 to indicate SizeOf each is equal.

        Store (0x01, Local0)

        if (LEqual (SizeOf(Arg0), SizeOf(Arg1)))
        {
            Store (0x00, Local0)
        }

        return (Local0)
    } // CMPR

    Method (TEST)
    {

        Store ("+++++++ SizeOfLv Test", Debug)

        // TBD: SizeOf ("string")
        //     SizeOf (Buffer)
        //     SizeOf (Package)
        //     SizeOf (String)
        //     SizeOf (STR0) -- where Name (STR0,...) -- lot's of cases
        //     buffer, string, package,
        //     SizeOf (METH) -- where METH control method returns
        //     buffer, string, package,

        // TBD: SLOC [SizeOf (Local0)] -- dup SARG

```



```

// Compare the elements that we expect to be the same. Exit out with an error
// code on the first failure.
if (LNotEqual (0x00, CMPR (STR0, STR1)))
{
    Return (0x01)
}

if (LNotEqual (0x00, CMPR (STR3, BUF3)))
{
    Return (0x02)
}

if (LNotEqual (0x00, CMPR (STR3, PKG3)))
{
    Return (0x03)
}

// In the following section, this test will cover the SizeOf
// operator for Local values.
// In this case, both Local0 and Local1 should have the same Size
Store (STR0, Local0)
Store (STR1, Local1)

if (LNotEqual (SizeOf (Local0), SizeOf (Local1)))
{
    Return (0x04)
}

// Now create a case where Local0 and Local1 are different
Store (STR2, Local1)

if (LEqual (SizeOf (Local0), SizeOf (Local1)))
{
    Return (0x05)
}

// Finally, check for the return of SizeOf for a known Buffer. Just
// in case we magically pass above cases due to all Buffers being Zero
// bytes in size, or Infinity, etc.
if (LNotEqual (0x05, SizeOf (BUF3)))
{
    Return (0x06)
}

Return (0)
} // TEST
} // SZLV

```

```

//
// test BytField.asl
//
// BytField test
// This is just a subset of the many RegionOp/Index Field test cases.
// Tests access of TBD.
//
Scope (\_SB) // System Bus
{ // _SB system bus
  Device (BYTF)
  { // Test device name
    Method (TEST)
    {
      Store ("+++++++ BytField Test", Debug)

      Return (\_TZ.C19B.RSLT)
    } // TEST
  } // BYTF

  Device (C005)
  { // Device C005
    Device (C013)
    { // Device C013
      } // Device C013
  } // Device C005

  Method (C115)
  { // C115 control method
    Acquire (\_GL, 0xFFFF)
    Store (\_SB.C005.C013.C058.C07E, Local0)
    Release (\_GL)
    And (Local0, 16, Local0)
    Store (ShiftRight (Local0, 4, ), Local1)
    If (LEqual (Local1, 0))
    { Return (1) }
    Else
    { Return (0) }
  } // C115 control method
} // _SB system bus

OperationRegion (C018, SystemIO, 0x5028, 4)
Field (C018, AnyAcc, NoLock, Preserve)
{ // Field overlaying C018
  C019, 32
} // Field overlaying C018

OperationRegion (C01A, SystemIO, 0x5030, 4)

```

```

Field (C01A, ByteAcc, NoLock, Preserve)
{ // Field overlaying C01A
    C01B, 8,
    C01C, 8,
    C01D, 8,
    C01E, 8
} // Field overlaying C01A

Mutex (\C01F, 0)
Name (\C020, 0)
Name (\C021, 0)

Method (\C022, 0)
{ // \C022 control method
    Acquire (\C01F, 0xFFFF)
    If (LEqual (\C021, 0))
    {
        Store (C019, Local0)
        And (Local0, 0xFFFEFFFE, Local0)
        Store (Local0, C019)
        Increment (\C021)
    }
    Release (\C01F)
} // \C022 control method

Scope (\_SB.C005.C013)
{ // Scope \_SB.C005.C013
    Device (C058)
    { // Device C058
        Name (_HID, "*PNP0A06")

        OperationRegion (C059, SystemIO, 0xE0, 2)
        Field (C059, ByteAcc, NoLock, Preserve)
        { // Field overlaying C059
            C05A, 8,
            C05B, 8
        } // Field overlaying C059

        OperationRegion (C05C, SystemIO, 0xE2, 2)
        Field (C05C, ByteAcc, NoLock, Preserve)
        { // Field overlaying C05C
            C05D, 8,
            C05E, 8
        } // Field overlaying C05C
        IndexField (C05D, C05E, ByteAcc, NoLock, Preserve)
        { // IndexField overlaying C05D/C05E
            , 0x410, // skip
            C05F, 8,

```

```

C060, 8,
C061, 8,
C062, 8,
C063, 8,
C064, 8,
C065, 8,
C066, 8,
C067, 8,
C068, 8,
C069, 8,
C06A, 8,
C06B, 8,
C06C, 8,
C06D, 8,
C06E, 8,
, 0x70, // skip
C06F, 8,
C070, 8,
C071, 8,
C072, 8,
C073, 8,
C074, 8,
C075, 8,
C076, 8,
C077, 8,
C078, 8,
C079, 8,
C07A, 8,
C07B, 8,
C07C, 8,
C07D, 8,
C07E, 8
} // IndexField overlaying C05D/C05E

OperationRegion (C07F, SystemIO, 0xE4, 2)
Field (C07F, ByteAcc, NoLock, Preserve)
{ // Field overlaying C07F
  C080, 8,
  C081, 8
} // Field overlaying C07F

OperationRegion (C082, SystemIO, 0xE0, 1)
Field (C082, ByteAcc, NoLock, Preserve)
{ // Field overlaying C082
  C083, 8
} // Field overlaying C082

OperationRegion (C084, SystemIO, 0xFF, 1)

```

Field (C084, ByteAcc, NoLock, Preserve)

```
{ // Field overlaying C084
  C085, 8
} // Field overlaying C084
```

OperationRegion (C086, SystemIO, 0xFD, 1)

Field (C086, ByteAcc, NoLock, Preserve)

```
{ // Field overlaying C086
  C087, 8
} // Field overlaying C086
```

Mutex (C088, 0)

Mutex (C089, 0)

Mutex (C08A, 0)

Mutex (C08B, 0)

Mutex (C08C, 0)

Mutex (C08D, 0)

Name (C08E, 0xFFFFFFFF)

Name (C08F, 0)

Method (C0AA, 4)

```
{ // C0AA control method
  Store (Buffer (4) {}, Local7)
  CreateByteField (Local7, 0, C0AB)
  CreateByteField (Local7, 1, C0AC)
  CreateByteField (Local7, 2, C0AD)
  CreateByteField (Local7, 3, C0AE)
  Acquire (^C08B, 0xFFFF)
  Acquire (\_GL, 0xFFFF)
  \C022 ()
  Store (1, \_SB.C005.C013.C058.C06B)
  While (LNot (LEqual (0, \_SB.C005.C013.C058.C06B)))
  { Stall (100) }
  Store (Arg3, \_SB.C005.C013.C058.C06E)
  Store (Arg2, \_SB.C005.C013.C058.C06D)
  Store (Arg1, \_SB.C005.C013.C058.C06C)
  Store (Arg0, \_SB.C005.C013.C058.C06B)
  While (LNot (LEqual (0, \_SB.C005.C013.C058.C06B)))
  { Stall (100) }
  Store (\_SB.C005.C013.C058.C06E, C0AB)
  Store (\_SB.C005.C013.C058.C06D, C0AC)
  Store (\_SB.C005.C013.C058.C06C, C0AD)
  Store (\_SB.C005.C013.C058.C06B, C0AE)
  If (LNot (LEqual (Arg0, 23)))
  {
    Store (2, \_SB.C005.C013.C058.C06B)
    Stall (100)
  }
}
```

```

    }
    Release (\_GL)
    Release (^C08B)
    Return (Local7)
  } // C0AA control method
} // Device C058
} // Scope \_SB.C005.C013

Scope (\_TZ)
{ // \_TZ thermal zone scope
  Name (C18B, Package (2))
  {
    Package (2)
    {
      Package (5) {0x05AC, 0x0CD2, 0x0D68, 0x0DE0, 0x0E4E},
      Package (5) {0x0D04, 0x0D9A, 0x0DFE, 0x0E80, 0x0FA2}
    },
    Package (2)
    {
      Package (5) {0x05AC, 0x0CD2, 0x0D68, 0x0DE0, 0x0E4E},
      Package (5) {0x0D04, 0x0D9A, 0x0DFE, 0x0E80, 0x0FA2}
    }
  }) // C18B

  Name (C18C, Package (2))
  {
    Package (2)
    {
      Package (3) {0x64, 0x4B, 0x32},
      Package (3) {0x64, 0x4B, 0x32}
    }
  }) // C81C

  Name (C18D, 0)
  Name (C18E, 0)
  Name (C18F, 0)
  Name (C190, 0)
  Name (C191, 3)
  Name (C192, 0)
  Name (C193, 1)
  Name (C194, 2)
  Mutex (C195, 0)
  Name (C196, 1)
  Name (C197, 0x0B9C)
  Name (C198, 0x0B9C)
  Name (C199, 0xFFFFFFFF)
  Name (C19A, 0)

```

```

Device (C19B)
{ // Device C19B
  Name (RSLT, 0) // default to zero

  Method (XINI)
  { // _INI control method (Uses Global Lock -- can't run under AcpiExec)
    Store (\_SB.C115, C19A)
    \_TZ.C19C._SCP (0)
    Subtract (0x0EB2, 0x0AAC, Local1) // Local1 = AACH - EB2h
    Divide (Local1, 10, Local0, Local2) // Local0 = Local1 / 10
                                     // Local2 = Local1 % 10
    \_SB.C005.C013.C058.C0AA (14, Local2, 0, 0)
    Store
      (DerefOf (Index (DerefOf (Index (\_TZ.C18C, C19A, )), 0, )), C18D)
    Store
      (DerefOf (Index (DerefOf (Index (\_TZ.C18C, C19A, )), 1, )), C18E)
    Store
      (DerefOf (Index (DerefOf (Index (\_TZ.C18C, C19A, )), 2, )), C18F)

    Store (1, RSLT) // set RSLT to 1 if _INI control method completes
  } // _INI control method

  // PowerResource (C19D) {...}
} // Device C19B

ThermalZone (C19C)
{
  Method (_SCP, 1)
  { // _SCP control method
    Store (Arg0, Local0)
    If (LEqual (Local0, 0))
    {
      Store (0, \_TZ.C192)
      Store (1, \_TZ.C193)
      Store (2, \_TZ.C194)
      Store (3, \_TZ.C191)
    }
    Else
    {
      Store (0, \_TZ.C191)
      Store (1, \_TZ.C192)
      Store (2, \_TZ.C193)
      Store (3, \_TZ.C194)
    }
  } // _SCP control method
} // ThermalZone C19C
} // \_TZ thermal zone scope

```

```

//
// test DwordFld.asl
//
Name (BUFR, buffer(10) {0,0,0,0,0,0,0,0,0,0} )

Device (DWDF)
{
  Method (TEST)
  {
    Store ("+++++++ DwordFld Test", Debug)

    CreateByteField (BUFR, 0, BYTE)
    Store (0xAA, BYTE)

    CreateWordField (BUFR, 1, WORD)
    Store (0xBBCC, WORD)

    CreateDWordField (BUFR, 3, DWRD)
    Store (0xDDEEFF00, DWRD)

    CreateByteField (BUFR, 7, BYT2)
    Store (0x11, BYT2)

    CreateWordField (BUFR, 8, WRD2)
    Store (0x2233, WRD2)

    Return (0)

  } // End Method TEST
} // Device DWDF

//
// test DivAddx.asl
//
Name (B1LO, 0xAA)
Name (B1HI, 0xBB)

Method (MKW_, 2)
{ // This control method will take two bytes and make them into a WORD

  Multiply (B1HI, 256, Local0) // Make high byte.....high
  Or (Local0, B1LO, Local0) // OR in the low byte
  Return (Local0) // Return the WORD

} // MKW_

Device (DVAX)

```



```

{
  Method (TEST)
  {

    Store ("+++++++ DivAddx Test", Debug)

    Store (25, B1LO)
    Store (0, B1HI)

    // We'll multiply 25 * 3 to get 75, add 99 to it then divide
    // by 100. We expect to get 74 for the remainder and 1 for
    // the quotient.
    Divide(
      Add (Multiply (3, MKW_ (B1LO, B1HI)), 0x63),
          // Dividend,
      100, // Divisor
      Local4, // Remainder
      Local2) // Quotient

    If (LAnd (LEqual (74, Local4), LEqual (1, Local2)))
    { // Indicate Pass
      Store (0x00, Local0)
    }

    Else
    { // Indicate Fail
      Store (0x01, Local0)
    }

    Return (Local0)
  } // End Method TEST
} // Device DVAX

//
// test IndexFld.asl (IndexOp6.asl)
//
// IndexFld test
// This is just a subset of the many RegionOp/Index Field test cases.
// Tests index field element AccessAs macro.
// Also tests name resolution of index field elements with same names
// but different namespace scopes.
//
Device (IDX6)
{ // Test device name

  OperationRegion (SIO, SystemIO, 0x100, 2)
  Field (SIO, ByteAcc, NoLock, Preserve)
  {

```

```

    INDX, 8,
    DATA, 8
}
IndexField (INDX, DATA, AnyAcc, NoLock, WriteAsOnes)
{
    AccessAs (ByteAcc, 0),
    IFE0, 8,
    IFE1, 8,
    IFE2, 8,
    IFE3, 8,
    IFE4, 8,
    IFE5, 8,
    IFE6, 8,
    IFE7, 8,
    IFE8, 8,
    IFE9, 8,
}

Device (TST_)
{ // TST_: provides a different namespace scope for IFE0 and IFE1
    OperationRegion (SIO2, SystemIO, 0x100, 2)
    Field (SIO2, ByteAcc, NoLock, Preserve)
    {
        IND2, 8,
        DAT2, 8
    }
    IndexField (IND2, DAT2, AnyAcc, NoLock, WriteAsOnes)
    {
        IFE0, 8, // duplicate IndexField name with different scope
        IFE1, 8
    }
} // TST_: provides a different namespace scope for IFE0 and IFE1

Method (TEST)
{
    Store ("+++++++ IndexOp6 Test", Debug)

    Store (IFE0, Local0)
    Store (IFE1, Local1)
    Store (IFE2, Local2)

    // validate name resolution of IndexFields with different scopes
    Store (\IDX6.IFE0, Local3)
    Store (\IDX6.IFE1, Local4)
    // verioading of namespace can resolve following names
    Store (\IDX6.TST_.IFE0, Local5)
    Store (\IDX6.TST_.IFE1, Local6)
}

```

```

    Return (0)
  } // TEST
} // IDX6

//
// test IndexOp5.asl
//
// IndexOp5 test
// This is just a subset of the many RegionOp/Index Field test cases.
// Tests copying string into buffer then performing IndexOp on result.
//
Device (IDX5)
{ // Test device name

    Name (OSFL, 0) // 0 == Windows 98, 1 == Windows NT

    // MCTH is a control method to compare two strings. It returns
    // zero if the strings mismatch, or 1 if the strings match.
    // This exercises the test case of copying a string into a buffer
    // and performing an IndexOp on the resulting buffer.
    Method (MCTH, 2) // Control Method to compare two strings
    { // MCTH: Control Method to compare two strings
        // Arg0: first string to compare
        // Arg1: second string to compare
        // Return: zero if strings mismatch, 1 if strings match

        // check if first string's length is less than second string's length
        If (LLess (SizeOf (Arg0), SizeOf (Arg1)))
            { Return (0) }

        // increment length to include NULL termination character
        Add (SizeOf (Arg0), 1, Local0) // Local0 = strlen(Arg0) + 1

        // create two buffers of size Local0 [strlen(Arg0)+1]
        Name (BUF0, Buffer (Local0) { })
        Name (BUF1, Buffer (Local0) { })

        // copy strings into buffers
        Store (Arg0, BUF0)
        Store (Arg1, BUF1)

        // validate BUF0 and BUF1 are still buffers
        Store (ObjectType (BUF0), Local1)
        If (LNotEqual (Local1, 3)) // Buffer is type 3
            { Return (20) }
        Store (ObjectType (BUF1), Local1)
        If (LNotEqual (Local1, 3)) // Buffer is type 3
            { Return (21) }
    }
}

```

```

// Decrement because the Index base below is zero based
// while Local0 length is one based.
Decrement (Local0)

While (Local0)
{ // loop through all BUF0 buffer elements
  Decrement (Local0)

  // check if BUF0[n] == BUF1[n]
  If (LEqual (DerefOf (Index (BUF0, Local0, )),
    DerefOf (Index (BUF1, Local0, )))
    { } // this is how the code was really implemented
  Else
    { Return (Zero) }
} // loop through all BUF0 buffer elements

Return (One) // strings / buffers match
} // MCTH: Control Method to compare two strings

Method (TEST)
{
  Store ("+++++++ IndexOp5 Test", Debug)

  If (MCTH (\_OS, "Microsoft Windows NT"))
    { Store (1, OSFL) }

  If (LNotEqual (OSFL, 1))
    { Return (11) }

  Return (0)
} // TEST
} // IDX5

//
// test IndexOp.asl
//
Scope (\_SB) // System Bus
{ // _SB system bus

  Method (C097)
    { Return (1) }

  Device (PCI2)
  { // Root PCI Bus
    Name (\_HID, EISAID("PNP0A03"))
    Name (\_ADR, 0x00000000)
  }
}

```

```

Name (_CRS, Buffer(26) {"\_SB_.PCI2._CRS....."})
Method (_STA) {Return (0x0F)}

Device (ISA)
{ // ISA bridge
  Name (_ADR, 0x00030000) // ISA bus ID

  Device (EC0)
  { // Embedded Controller
    Name (_GPE, 0) // EC use GPE0
    Name (_ADR, 0x0030000) // PCI address

    Method (_STA,0) // EC Status
      { Return(0xF) } // EC is functioning

    Name (_CRS, ResourceTemplate()
      {
        IO (Decode16, 0x62, 0x62, 1, 1)
        IO (Decode16, 0x66, 0x66, 1, 1)
      }
    )

    // create EC's region and field
    OperationRegion (RAM, SystemMemory, 0x400000, 0x100)
    Field (RAM, AnyAcc, NoLock, Preserve)
    {
      // AC information
      ADP, 1, // AC Adapter 1:On-line, 0:Off-line
      AFLT, 1, // AC Adapter Fault 1:Fault 0:Normal
      BAT0, 1, // BAT0 1:present, 0:not present
      , 1, // reserved
      , 28, // filler to force DWORD alignment

      // CMBatt information
      BPU0, 32, // Power Unit
      BDC0, 32, // Designed Capacity
      BFC0, 32, // Last Full Charge Capacity
      BTC0, 32, // Battery Technology
      BDV0, 32, // Design Voltage
      BST0, 32, // Battery State
      BPR0, 32, // Battery Present Rate
        // (Designed Capacity)x(%)/{(h)x100}
      BRC0, 32, // Battery Remaining Capacity
        // (Designed Capacity)(%)^100
      BPV0, 32, // Battery Present Voltage
      BTP0, 32, // Trip Point
      BCW0, 32, // Design capacity of Warning
      BCL0, 32, // Design capacity of Low
    }
  }
}

```

```

        BCG0, 32, // capacity granularity 1
        BG20, 32, // capacity granularity 2
        BMO0, 32, // Battery model number field
        BIF0, 32, // OEM Information(00h)
        BSN0, 32, // Battery Serial Number
        BTY0, 32, // Battery Type (e.g., "Li-Ion")
        BTY1, 32 // Battery Type (e.g., "Li-Ion")
    } // Field
} // EC0: Embedded Controller
} // ISA bridge
} // PCI2 Root PCI Bus

```

Device (IDX0)

```

{ // Test device name
    Name (_HID, EISAID ("PNP0C0A")) // Control Method Battery ID
    Name (_PCL, Package() {\_SB})
    Method (_STA)
    {
        // _STA bits 0-3 indicate existence of battery slot
        // _STA bit 4 indicates battery (not) present
        If (\_SB.PCI2.ISA.EC0.BAT0)
            { Return (0x1F) } // Battery present
        else
            { Return (0x0F) } // Battery not present
    } // _STA

```

Method (_BIF)

```

{
    Name (BUFR, Package(13) {})
    Store (\_SB.PCI2.ISA.EC0.BPU0, Index (BUFR,0)) // Power Unit
    Store (\_SB.PCI2.ISA.EC0.BDC0, Index (BUFR,1)) // Designed Capacity
    Store (\_SB.PCI2.ISA.EC0.BFC0, Index (BUFR,2)) // Last Full Charge Capa.
    Store (\_SB.PCI2.ISA.EC0.BTC0, Index (BUFR,3)) // Battery Technology
    Store (\_SB.PCI2.ISA.EC0.BDV0, Index (BUFR,4)) // Designed Voltage
    Store (\_SB.PCI2.ISA.EC0.BCW0, Index (BUFR,5)) // Designed warning level
    Store (\_SB.PCI2.ISA.EC0.BCL0, Index (BUFR,6)) // Designed Low level
    Store (\_SB.PCI2.ISA.EC0.BCG0, Index (BUFR,7)) // Capacity granularity 1
    Store (\_SB.PCI2.ISA.EC0.BG20, Index (BUFR,8)) // Capacity granularity 2

    Store ("", Index (BUFR,9)) // Model Number

    Store ("", Index (BUFR,10)) // Serial Number

    Store ("LiOn", Index (BUFR,11)) // Battery Type

    Store ("Chicony", Index (BUFR,12)) // OEM Information

    Return (BUFR)

```

```

} // _BIF

Method (_BST)
{
    Name (BUFR, Package(4) {1, 0x100, 0x76543210, 0x180})
    Return (BUFR)
} // _BST

Method (_BTP,1)
{
    Store (arg0, \_SB.PCI2.ISA.EC0.BTP0) // Set Battery Trip point
}

Method (TEST)
{

    Store ("+++++++ IndexOp Test", Debug)

    // test storing into uninitialized package elements
    Name (PBUF, Package(4) {}) // leave uninitialized
    Store (0x01234567, Index (PBUF,0))
    Store (0x89ABCDEF, Index (PBUF,1))
    Store (0xFEDCBA98, Index (PBUF,2))
    Store (0x76543210, Index (PBUF,3))

    // verify values stored into uninitialized package elements
    If (LNotEqual (DerefOf (Index (PBUF,0)), 0x01234567))
        { Return (0x10) }

    If (LNotEqual (DerefOf (Index (PBUF,1)), 0x89ABCDEF))
        { Return (0x11) }

    If (LNotEqual (DerefOf (Index (PBUF,2)), 0xFEDCBA98))
        { Return (0x12) }

    If (LNotEqual (DerefOf (Index (PBUF,3)), 0x76543210))
        { Return (0x13) }

    // store _BIF package return value into Local0
    Store (_BIF, Local0)

    // save Local0 object type value into Local1
    Store (ObjectType (Local0), Local1)

    // validate Local0 is a Package
    If (LNotEqual (Local1, 4)) // Package type is 4
        { Return (0x21) } // failure

```

```

// test storing into buffer field elements
Name (BUFR, Buffer(16)
  { // initial values
    00, 00, 00, 00, 00, 00, 00, 00,
    00, 00, 00, 00, 00, 00, 00, 00,
  }
) // BUFR
// test storing into buffer field elements
Store (0x01234567, Index (BUFR,0)) // should only store 0x67
Store (0x89ABCDEF, Index (BUFR,4)) // should only store 0xEF
Store (0xFEDCBA98, Index (BUFR,8)) // should only store 0x98
Store (0x76543210, Index (BUFR,12)) // should only store 0x10

// verify storing into buffer field elements
If (LNotEqual (DerefOf (Index (BUFR,0)), 0x67))
  { Return (0x30) }

If (LNotEqual (DerefOf (Index (BUFR,1)), 0))
  { Return (0x31) }

If (LNotEqual (DerefOf (Index (BUFR,4)), 0xEF))
  { Return (0x34) }

If (LNotEqual (DerefOf (Index (BUFR,8)), 0x98))
  { Return (0x38) }

If (LNotEqual (DerefOf (Index (BUFR,12)), 0x10))
  { Return (0x3C) }

Return (0) // pass
} // TEST
} // IDX0
} // _SB system bus

//
// test BitIndex.asl
//
// BitIndex test
// This is a test case for accessing fields defined as single bits in
// memory. This is done by creating two index fields that overlay the
// same DWORD in memory. One field accesses the DWORD as a DWORD, the
// other accesses individual bits of the same DWORD field in memory.
//
Scope (\_SB) // System Bus
{ // _SB system bus

```


OperationRegion (RAM, SystemMemory, 0x800000, 0x100)

Field (RAM, AnyAcc, NoLock, Preserve)

```
{ // Any access
  TREE, 3,
  WRD0, 16,
  WRD1, 16,
  WRD2, 16,
  WRD3, 16,
  WRD4, 16,
  DWRD, 32, // DWORD field
}
```

Field (RAM, AnyAcc, NoLock, Preserve)

```
{ // Any access
  THRE, 3,
  WD00, 16,
  WD01, 16,
  WD02, 16,
  WD03, 16,
  WD04, 16,
  BYT0, 8, // Start off with a BYTE
  BIT0, 1, // single-bit field
  BIT1, 1, // single-bit field
  BIT2, 1, // single-bit field
  BIT3, 1, // single-bit field
  BIT4, 1, // single-bit field
  BIT5, 1, // single-bit field
  BIT6, 1, // single-bit field
  BIT7, 1, // single-bit field
  BIT8, 1, // single-bit field
  BIT9, 1, // single-bit field
  BITA, 1, // single-bit field
  BITB, 1, // single-bit field
  BITC, 1, // single-bit field
  BITD, 1, // single-bit field
  BITE, 1, // single-bit field
  BITF, 1, // single-bit field
  BYTZ, 8, // End with a BYTE for a total of 32 bits
}
```

Device (BITI)

```
{ // Test device name
```

```
  Method (MBIT) // Test single bit memory accesses
```

```
{
```

```
  If (LNotEqual (DWRD, 0x00))
```

```
  {
```

```
    Store (0xFF00, Local0)
```

```

}
Else
{
    // Prime Local0 with 0...assume passing condition
    Store (0, Local0)

    // set memory contents to known values using DWORD field
    Store (0x5A5A5A5A, DWRD)

    // Given the value programmed into DWRD, only the odd bits
    // of the lower nibble should be set. BIT1, BIT3 should be set.
    // BIT0 and BIT2 should be clear

    If (BIT0)
    {
        Or (Local0, 0x01, Local0)
    }

    If (LNot (BIT1))
    {
        Or (Local0, 0x02, Local0)
    }

    If (BIT2)
    {
        Or (Local0, 0x04, Local0)
    }

    If (LNot (BIT3))
    {
        Or (Local0, 0x08, Local0)
    }

    // Now check the upper nibble. Only the "even" bits should
    // be set. BIT4, BIT6. BIT5 and BIT7 should be clear.
    If (LNot (BIT4))
    {
        Or (Local0, 0x10, Local0)
    }

    If (BIT5)
    {
        Or (Local0, 0x20, Local0)
    }

    If (LNot (BIT6))
    {
        Or (Local0, 0x40, Local0)
    }

```

```

    }

    If (BIT7)
    {
        Or (Local0, 0x80, Local0)
    }
} // End Else DWRD zeroed out

Return (Local0)
} // MBIT: Test single bit memory accesses

Method (TEST)
{

    Store ("+++++++ BitIndex Test", Debug)

    // Zero out DWRD
    Store (0x00000000, DWRD)

    // MBIT returns zero if successful
    // This may be causing problems -- Return (MBIT)
    Store (MBIT, Local0)

    Return (Local0)
} // TEST
} // BITI
} // _SB system bus

//
// test IndexOp3.asl
//
// Additional IndexOp test cases to support ACPI_CMB (control method battery
// test) on Compaq laptops. Test cases include storing a package into
// an IndexOp target and validating that changing source and destination
// package contents are independent of each other.
//
Scope (\_SB) // System Bus
{ // _SB system bus

    Name (C174, 13)
    Name (C175, 8)

    Device (C158)
    { // C158: AC Adapter device
        Name (_HID, "ACPI0003") // AC Adapter device
        Name (_PCL, Package (1) {\_SB})

    Method (_PSR)

```

```

{
    Acquire (\_GL, 0xFFFF)
    Release (\_GL)
    And (Local0, 1, Local0) // Local0 &= 1
    Return (Local0)
} // _PSR
} // C158: AC Adapter device

Name (C176, Package (4) {"Primary", "MultiBay", "DockRight", "DockLeft"})

Name (C177, Package (4) {0x99F5, 0x99F5, 0x995F, 0x995F})

Name (C178, Package (4)
{
    Package (4) {0, 0, 0x966B, 0x4190},
    Package (4) {0, 0, 0x966B, 0x4190},
    Package (4) {0, 0, 0x966B, 0x4190},
    Package (4) {0, 0, 0x966B, 0x4190}
}) // C178

Name (C179, Package (4) {0, 0, 0x966B, 0x4190})

Name (C17A, Package (4)
{
    Package (3) {0, 0, 0},
    Package (3) {0, 0, 0},
    Package (3) {0, 0, 0},
    Package (3) {0, 0, 0}
}) // C17A

Method (C17B, 1)
{ // C17B: _BIF implementation
    Name (C17C, Package (13)
    { // C17C: _BIF control method return package
        0, // Power Unit (0 ==> mWh and mW)
        0x99F5, // Design Capacity
        0x99F5, // Last Full Charge Capacity
        1, // Battery Technology (1 ==> rechargeable)
        0x3840, // Design Voltage
        0x1280, // Design Capacity of Warning
        0x0AC7, // Design Capacity of Low
        1, // Battery Capacity Granularity 1 (Low -- Warning)
        1, // Battery Capacity Granularity 2 (Warning -- Full)
        "2891", // Model Number (ASCIIZ)
        "(-Unknown-)", // Serial Number (ASCIIZ)
        "LiIon", // Battery Type (ASCIIZ)
        0 // OEM Information (ASCIIZ)
    }) // C17C: _BIF control method return package
}

```

```

And (Arg0, 7, Local0)          // Local0 = Arg0 & 7

ShiftRight (Local0, 1, Local4) // Local4 = Local0 >> 1

Store (C179, Index (C178, Local4, )) // C178->Local4 = C179

// verify source and destination packages can be altered independent
// of each other (i.e., changing one's contents does NOT change other's
// contents)
Store (0x1234, Index (C179, 2, )) // C179[2] = 0x1234
Store (DerefOf (Index (C179, 2, )), Local2) // Local2 = C179[2]
if (LNotEqual (Local2, 0x1234))
{ Return (0x1234) }

// Local2 = C178[0,2]
Store (DerefOf (Index (DerefOf (Index (C178, 0, )), 2, )), Local2)
if (LNotEqual (Local2, 0x966B))
{ Return (0x1234) }

// Restore data to allow iterative execution
Store (0x966B, Index (C179, 2, )) // C179[2] = 0x966B

// C178[0,3] = 0x5678
Store (0x5678, Index (DerefOf (Index (C178, 0, )), 3, ))
// Local2 = C178[0,3]
Store (DerefOf (Index (DerefOf (Index (C178, 0, )), 3, )), Local2)
if (LNotEqual (Local2, 0x5678))
{ Return (0x5678) }

Store (DerefOf (Index (C179, 3, )), Local2) // Local2 = C179[3]
if (LNotEqual (Local2, 0x4190))
{ Return (0x5678) }

// Restore data to allow iterative execution
Store (0x4190, Index (DerefOf (Index (C178, 0, )), 3, )) // C179[2] = 0x4190

Return (C17C)
} // C17B: _BIF implementation

Device (C154)
{ // C154: Battery 0
Name (_HID, "*PNP0C0A") // Control Method Battery ID
Name (_UID, 0) // first instance

Method (_BIF)
{ // _BIF
Return (C17B (48))
} // _BIF

```

```

} // C154: Battery 0

Device (IDX3)
{
Method (LCLB)
{ // LCLB control method: test Index(Local#) where Local# is buffer
// Local0 is index counter
// Local1 is buffer
// Local2 receives BUFR[Local0] via Deref(Index(Local1...))
// Local3 is Local1 or Local2 object type
// Local4 is return error code

Name (BUFR, Buffer () {0, 1, 2, 3, 4, 5, 6, 7, 8, 9})

// save PKG into Local1
Store (BUFR, Local1)

// save Local2 object type value into Local3
Store (ObjectType (Local1), Local3)

// validate Local1 is a Buffer
If (LNotEqual (Local3, 3)) // Buffer type is 3
{ Return (0x9F) }

Store (0, Local0)
While (LLess (Local0, 5))
{ // While (Local0 < 5)
// Local2 = Local1[Local0]
Store (DerefOf (Index (Local1, Local0, )), Local2)

// save Local2 object type value into Local3
Store (ObjectType (Local2), Local3)

// validate Local2 is a Number
If (LNotEqual (Local3, 1)) // Number type is 1
{ Return (0x9E) }

// validate Local1[Local0] value == Local0
If (LNotEqual (Local0, Local2))
{ // Local0 != Local2 == PKG[Local0]
// Local4 = 0x90 + loop index (Local0)
Add (0x90, Local0, Local4)

// return 0x90 + loop index
Return (Local4)
}
}

```

```

    Increment (Local0)
} // While (Local0 < 5)

Store ("DerefOf(Index(LocalBuffer,,)) PASS", Debug)

Return (0) // Pass
} // LCLB control method: test Index(Local#) where Local# is buffer

Method (LCLP)
{ // LCLP control method: test Index(Local#) where Local# is package
  // Local0 is index counter
  // Local1 is package
  // Local2 receives PKG[Local0] via Deref(Index(Local1...))
  // Local3 is Local1 or Local2 object type
  // Local4 is return error code

  Name (PKG, Package () {0, 1, 2, 3, 4, 5, 6, 7, 8, 9})

  // save PKG into Local1
  Store (PKG, Local1)

  // save Local2 object type value into Local3
  Store (ObjectType (Local1), Local3)

  // validate Local1 is a Package
  If (LNotEqual (Local3, 4)) // Package type is 4
    { Return (0x8F) }

  Store (0, Local0)
  While (LLess (Local0, 5))
  { // While (Local0 < 5)
    // Local2 = Local1[Local0]
    Store (DerefOf (Index (Local1, Local0, )), Local2)

    // save Local2 object type value into Local3
    Store (ObjectType (Local2), Local3)

    // validate Local2 is a Number
    If (LNotEqual (Local3, 1)) // Number type is 1
      { Return (0x8E) }

    // validate Local1[Local0] value == Local0
    If (LNotEqual (Local0, Local2))
    { // Local0 != Local2 == PKG[Local0]
      // Local4 = 0x80 + loop index (Local0)
      Add (0x80, Local0, Local4)

```

```

        // return 0x80 + loop index
        Return (Local4)
    }

    Increment (Local0)
} // While (Local0 < 5)

Store ("DerefOf(Index(LocalPackage,,)) PASS", Debug)

Return (0) // Pass
} // LCLP control method: test Index(Local#) where Local# is package

Method (TEST)
{

    Store ("+++++++ IndexOp3 Test", Debug)

    // store _BIF package return value into Local0
    Store (\_SB.C154._BIF, Local0)

    // save Local0 object type value into Local1
    Store (ObjectType (Local0), Local1)

    // validate Local0 is a Package
    If (LNotEqual (Local1, 4)) // Package type is 4
    { // failure: did not return a Package (type 4)
        // if Local0 is a Number, it contains an error code
        If (LEqual (Local1, 1)) // Number type is 1
        { Return (Local0) } // return Local0 error code
        Else // Local0 is not a Number
        { Return (1) } // return default error code
    } // failure: did not return a Package (type 4)

    // save LCLB control method return value into Local2
    Store (LCLB, Local2)
    If (LNotEqual (Local2, 0))
    { Return (Local2) } // return failure code

    // save LCLP control method return value into Local2
    Store (LCLP, Local2)
    If (LNotEqual (Local2, 0))
    { Return (Local2) } // return failure code

    Return (0) // Pass
} // TEST
} // IDX3: Test device name
} // _SB system bus

```



```

//
// MTL developed test to exercise Indexes into buffers
//
Device(IDX7)
{

    Name (PKG4, Package() {
        0x2,
        "A short string",
        Buffer() {0xA, 0xB, 0xC, 0xD},
        0x1234,
        Package() {IDX7, 0x3}
    })

    //
    // Generic Test method
    //
    // This test returns 0xE (14) - ObjectType = Buffer Field
    Method(TST1)
    {
        Name (DEST, Buffer ()           // 62 characters plus NULL
            {"Destination buffer that is longer than the short source buffer"})

        // verify object type returned by Index(Buffer,Element,)
        Store (Index (DEST, 2, ), Local1)
        Store (ObjectType (Local1), Local2)
        If (LEqual(Local2, 14))
        {
            Return(0)
        }
        Else
        {
            Return(0x1)
        }
    }

    Method(TST2)
    {
        Name (BUF0, Buffer() {0x1, 0x2, 0x3, 0x4, 0x5})
        Store(0x55, Index(BUF0, 2))
        Store(DerefOf(Index(BUF0, 2)), Local0)
        If (LEqual(Local0, 0x55))
        {
            Return(0)
        }
        Else
        {

```

```

    Return(0x2)
}

}

Method(TST3)
{
    Name (BUF1, Buffer() {0x1, 0x2, 0x3, 0x4, 0x5})
    Store(Index(BUF1, 1), Local0)
    Store(DerefOf(Local0), Local1)
    If (LEqual(Local1, 0x2))
    {
        Return(0)
    }
    Else
    {
        Return(0x3)
    }
}

Method(TST4)
{
    // Index (PKG4, 0) is a Number
    Store (Index (PKG4, 0), Local0)
    Store (ObjectType(Local0), Local1)
    If (LEqual(Local1, 0x1))
    {
        Return(0)
    }
    Else
    {
        Return(0x4)
    }
}

Method(TST5)
{
    // Index (PKG4, 1) is a String
    Store (Index (PKG4, 1), Local0)
    Store (ObjectType(Local0), Local1)
    If (LEqual(Local1, 0x2))
    {
        Return(0)
    }
    Else

```

```

    {
        Return(0x5)
    }

}

Method(TST6)
{
    // Index (PKG4, 2) is a Buffer
    Store (Index (PKG4, 2), Local0)
    Store (ObjectType(Local0), Local1)
    If (LEqual(Local1, 0x3))
    {
        Return(0)
    }
    Else
    {
        Return(0x6)
    }
}

Method(TST7)
{
    // Index (PKG4, 3) is a Number
    Store (Index (PKG4, 3), Local0)
    Store (ObjectType(Local0), Local1)
    If (LEqual(Local1, 0x1))
    {
        Return(0)
    }
    Else
    {
        Return(0x7)
    }
}

Method(TST8)
{
    // Index (PKG4, 4) is a Package
    Store (Index (PKG4, 4), Local0)
    Store (ObjectType(Local0), Local1)
    If (LEqual(Local1, 0x4))
    {
        Return(0)
    }
    Else

```

```

    {
        Return(0x8)
    }

}

Method(TST9)
{
    // Derefof (Index (PKG4, 0)) is a Number
    Store (Derefof (Index (PKG4, 0)), Local0)
    If (LEqual(Local0, 0x2))
    {
        Return(0)
    }
    Else
    {
        Return(0x9)
    }
}

Method(TSTA)
{
    // Derefof (Index (PKG4, 1)) is a String
    Store (Derefof (Index (PKG4, 1)), Local0)
    Store (SizeOf(Local0), Local1)
    If (LEqual(Local1, 0xE))
    {
        Return(0)
    }
    Else
    {
        Return(0xA)
    }
}

Method(TSTB)
{
    // Derefof (Index (PKG4, 2)) is a Buffer
    Store (Derefof (Index (PKG4, 2)), Local0)
    Store (SizeOf(Local0), Local1)
    If (LEqual(Local1, 0x4))
    {
        Return(0)
    }
    Else
    {

```

```

    Return(0xB)
}

}

Method(TSTC)
{
    // DereferOf (Index (PKG4, 3)) is a Number
    Store (DereferOf (Index (PKG4, 3)), Local0)
    If (LEqual(Local0, 0x1234))
    {
        Return(0)
    }
    Else
    {
        Return(0xC)
    }
}

}

Method(TSTD)
{
    // DereferOf (Index (PKG4, 4)) is a Package
    Store (DereferOf (Index (PKG4, 4)), Local0)
    Store (SizeOf(Local0), Local1)
    If (LEqual(Local1, 0x2))
    {
        Return(0)
    }
    Else
    {
        Return(0xD)
    }
}

}

Method(TSTE)
{
    // DereferOf (Index (PKG4, 2)) is a Buffer
    Store (DereferOf (Index (PKG4, 2)), Local0)
    // DereferOf (Index (Local0, 1)) is a Number
    Store (DereferOf (Index (Local0, 1)), Local1)
    If (LEqual(Local1, 0xB))
    {
        Return(0)
    }
    Else
    {

```

```

    Return(0xE)
}

}

Method (TSTF)
{
    Name (SRCB, Buffer (12) {}) // 12 characters
    Store ("Short Buffer", SRCB)

    Name (DEST, Buffer () // 62 characters plus NULL
        {"Destination buffer that is longer than the short source buffer"})

    // overwrite DEST contents, starting at buffer position 2
    Store (SRCB, Index (DEST, 2))

    //
    // The DEST buffer element should be replaced with the last element of
    // the SRCB element (i.e. 's'->'r')
    Store (DerefOf (Index (DEST, 2)), Local0)

    If (LNotEqual (Local0, 0x72)) // 'r'
    {
        // DEST element does not match the value from SRCB
        Return(Or(Local0, 0x1000))
    }

    Return(0)
}

Method (TSTG)
{

    Name (SRCB, Buffer (12) {}) // 12 characters
    Store ("Short Buffer", SRCB)

    Name (DEST, Buffer () // 62 characters plus NULL
        {"Destination buffer that is longer than the short source buffer"})

    // overwrite DEST contents, starting at buffer position 2
    Store (SRCB, Index (DEST, 2))

    //
    // The next element of DEST should be unchanged
    //
    Store (DerefOf (Index (DEST, 3)), Local0)

    If (LNotEqual (Local0, 0x74)) // 't'

```

```

{
    // DEST has been changed
    Return(Or(Local0, 0x2000))
}

//
// The next element of DEST should be unchanged
//
Store (DerefOf (Index (DEST, 4)), Local0)

If (LNotEqual (Local0, 0x69))    // 'i'
{
    // DEST has been changed
    Return(Or(Local0, 0x2100))
}

//
// The next element of DEST should be unchanged
//
Store (DerefOf (Index (DEST, 5)), Local0)

If (LNotEqual (Local0, 0x6E))    // 'n'
{
    // DEST has been changed
    Return(Or(Local0, 0x2200))
}

//
// The next element of DEST should be unchanged
//
Store (DerefOf (Index (DEST, 6)), Local0)

If (LNotEqual (Local0, 0x61))    // 'a'
{
    // DEST has been changed
    Return(Or(Local0, 0x2300))
}

//
// The next element of DEST should be unchanged
//
Store (DerefOf (Index (DEST, 7)), Local0)

If (LNotEqual (Local0, 0x74))    // 't'
{
    // DEST has been changed
    Return(Or(Local0, 0x2400))
}

```

```

//
// Verify DEST elements beyond end of SRCB buffer copy
// have not been changed
Store (DerefOf (Index (DEST, 14)), Local0)

If (LNotEqual (Local0, 0x66)) // 'f'
{
    // DEST has been changed
    Return(Or(Local0, 0x2400))
}

Return(0)
}

//
// This test shows that MS ACPI.SYS stores only the lower 8-bits of a 32-bit
// number into the index'ed buffer
//
Method (TSTH)
{
    // Create a Destination Buffer
    Name (DBUF, Buffer () {"abcdefghijklmnopqrstuvwxyz"})

    // Store a number > UINT8 into an index of the buffer
    Store (0x12345678, Index(DBUF, 2))

    // Check the results
    Store (DerefOf (Index (DBUF, 2)), Local0)
    If (LNotEqual (Local0, 0x78)) // 0x78
    {
        Return(Or(Local0, 0x3000))
    }

    Store (DerefOf (Index (DBUF, 3)), Local0)
    If (LNotEqual (Local0, 0x64)) // 'd'
    {
        Return(Or(Local0, 0x3100))
    }

    Store (DerefOf (Index (DBUF, 4)), Local0)
    If (LNotEqual (Local0, 0x65)) // 'e'
    {
        Return(Or(Local0, 0x3200))
    }

    Store (DerefOf (Index (DBUF, 5)), Local0)
    If (LNotEqual (Local0, 0x66)) // 'f'

```



```

    {
        Return(Or(Local0, 0x3300))
    }

Return(0)
}

Method (TSTI)
{
    // Create a Destination Buffer
    Name (DBUF, Buffer () {"abcdefghijklmnopqrstuvwxyz"})

    // Store a String into an index of the buffer
    Store ("ABCDEFGH", Index(DBUF, 2))

    // Check the results
    Store (DerefOf (Index (DBUF, 2)), Local0)
    If (LNotEqual (Local0, 0x48)) // 'H'
    {
        Return(Or(Local0, 0x4000))
    }

    Store (DerefOf (Index (DBUF, 3)), Local0)
    If (LNotEqual (Local0, 0x64)) // 'd'
    {
        Return(Or(Local0, 0x4100))
    }

    Store (DerefOf (Index (DBUF, 4)), Local0)
    If (LNotEqual (Local0, 0x65)) // 'e'
    {
        Return(Or(Local0, 0x4200))
    }

    Store (DerefOf (Index (DBUF, 5)), Local0)
    If (LNotEqual (Local0, 0x66)) // 'f'
    {
        Return(Or(Local0, 0x4300))
    }

    Return(0)
}

Method(TSTJ)
{
    // Create a Destination Buffer
    Name (DBUF, Buffer () {"abcdefghijklmnopqrstuvwxyz"})

```

```

// Store a number > UINT8 into an index of the buffer
Store (0x1234, Index(DBUF, 2))

// Check the results
Store (DerefOf (Index (DBUF, 2)), Local0)
If (LNotEqual (Local0, 0x34)) // 0x34
{
    Return(Or(Local0, 0x3000))
}

Store (DerefOf (Index (DBUF, 3)), Local0)
If (LNotEqual (Local0, 0x64)) // 'd'
{
    Return(Or(Local0, 0x3100))
}

Store (DerefOf (Index (DBUF, 4)), Local0)
If (LNotEqual (Local0, 0x65)) // 'e'
{
    Return(Or(Local0, 0x3200))
}

Store (DerefOf (Index (DBUF, 5)), Local0)
If (LNotEqual (Local0, 0x66)) // 'f'
{
    Return(Or(Local0, 0x3300))
}

Return(0)
}

Method(TSTK)
{
    // Create a Destination Buffer
    Name (DBUF, Buffer () {"abcdefghijklmnopqrstuvwxyz"})

    // Store a number > UINT8 into an index of the buffer
    Store (0x123456, Index(DBUF, 2))

    // Check the results
    Store (DerefOf (Index (DBUF, 2)), Local0)
    If (LNotEqual (Local0, 0x56)) // 0x56
    {
        Return(Or(Local0, 0x3000))
    }

    Store (DerefOf (Index (DBUF, 3)), Local0)
    If (LNotEqual (Local0, 0x64)) // 'd'

```

```

    {
        Return(Or(Local0, 0x3100))
    }

Store (DerefOf (Index (DBUF, 4)), Local0)
If (LNotEqual (Local0, 0x65)) // 'e'
{
    Return(Or(Local0, 0x3200))
}

Store (DerefOf (Index (DBUF, 5)), Local0)
If (LNotEqual (Local0, 0x66)) // 'f'
{
    Return(Or(Local0, 0x3300))
}

Return(0)
}

Method(TSTL)
{
    // Create a Destination Buffer
    Name (DBUF, Buffer () {"abcdefghijklmnopqrstuvwxyz"})

    // Store a number > UINT8 into an index of the buffer
    Store (0x12, Index(DBUF, 2))

    // Check the results
    Store (DerefOf (Index (DBUF, 2)), Local0)
    If (LNotEqual (Local0, 0x12)) // 0x12
    {
        Return(Or(Local0, 0x3000))
    }

    Store (DerefOf (Index (DBUF, 3)), Local0)
    If (LNotEqual (Local0, 0x64)) // 'd'
    {
        Return(Or(Local0, 0x3100))
    }

    Store (DerefOf (Index (DBUF, 4)), Local0)
    If (LNotEqual (Local0, 0x65)) // 'e'
    {
        Return(Or(Local0, 0x3200))
    }

    Store (DerefOf (Index (DBUF, 5)), Local0)
    If (LNotEqual (Local0, 0x66)) // 'f'

```

```

    {
        Return(Or(Local0, 0x3300))
    }

Return(0)
}

Method(TEST)
{
    Store ("+++++++ IndexOp7 Test", Debug)

    Store(TST1(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }

    Store(TST2(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }

    Store(TST3(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }

    Store(TST4(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }

    Store(TST5(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }

    Store(TST6(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }

    Store(TST7(), Local0)

```

```
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TST8(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TST9(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TSTA(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TSTB(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TSTC(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TSTD(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

```
Store(TSTE(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}
```

/ No longer ACPI compliant */*

```

/*
    Store(TSTF(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }
*/

Store(TSTG(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}

Store(TSTH(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}

/* No longer ACPI compliant */
/*
    Store(TSTI(), Local0)
    if (LGreater (Local0, 0))
    {
        Return(Local0)
    }
*/

Store(TSTJ(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}

Store(TSTK(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}

Store(TSTL(), Local0)
if (LGreater (Local0, 0))
{
    Return(Local0)
}

Return(Local0)

```

```

    }

} // Device(IDX7)

//
// test MatchOp.asl
//
// MatchOp test cases that utilize nested DerefOf(Index(...)) to validate
// MatchOp, DerefOfOp, and IndexOp of nested packages.
//
Device (MTCH)
{

    Method (TEST)
    {
        Store ("+++++++ MatchOp Test", Debug)

        Name (TIM0, Package ()
            {
                Package () {0x78, 0xB4, 0xF0, 0x0384},
                Package () {0x23, 0x21, 0x10, 0},
                Package () {0x0B, 9, 4, 0},
                Package () {0x70, 0x49, 0x36, 0x27, 0x19},
                Package () {0, 1, 2, 1, 2},
                Package () {0, 0, 0, 1, 1},
                Package () {4, 3, 2, 0},
                Package () {2, 1, 0, 0}
            }) // TIM0

        Name (TMD0, Buffer (20) {0xFF, 0xFF, 0xFF, 0xFF })
        CreateDWordField (TMD0, 0, PIO0) // 0xFFFFFFFF
        CreateDWordField (TMD0, 4, DMA0)
        CreateDWordField (TMD0, 8, PIO1)
        CreateDWordField (TMD0, 12, DMA1)
        CreateDWordField (TMD0, 16, CHNF)

        // validate PIO0 value
        Store (PIO0, Local3)

        // save Local3 object type value into Local2
        Store (ObjectType (Local3), Local2)

        // validate Local3 is a Number
        If (LNotEqual (Local2, 1)) // Number type is 1
            { Return (2) } // failure

        // validate Local3 Number value

```

```

If (LNotEqual (Local3, 0xFFFFFFFF)) // Number value 0xFFFFFFFF
  { Return (3) } // failure

Store ("DWordField PASS", Debug)

Store (0, Local5)
Store (Match (DerefOf (Index (TIM0, 1, )), MLE, Local5, MTR, 0, 0), Local6)

// save Local6 object type value into Local2
Store (ObjectType (Local6), Local2)

// validate Local6 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
  { Return (4) } // failure

Store ("Match(DerefOf(Index(TIM0,1)),... PASS", Debug)

// validate following produces a nested package to validate
// that MatchOp did not corrupt SearchPackage (TIM0)
Store (DerefOf (Index (TIM0, 1, )), Local4)

// save Local4 object type value into Local2
Store (ObjectType (Local4), Local2)

// validate Local4 is a Package
If (LNotEqual (Local2, 4)) // Package type is 4
  { Return (5) } // failure

Store ("DerefOf(Index(TIM0,1)),... PASS", Debug)

And (Match (DerefOf (Index (TIM0, 0, )), MGE, PIO0, MTR, 0, 0), 3, Local0)

// save Local0 object type value into Local2
Store (ObjectType (Local0), Local2)

// validate Local0 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
  { Return (6) } // failure

// validate Local0 Number value
If (LNotEqual (Local0, 3)) // Number value 3
  { Return (7) } // failure

Store ("And(Match(DerefOf(Index(TIM0,0)),... PASS", Debug)

```



```

// again, validate following produces a nested package
Store (DerefOf (Index (TIM0, 1, )), Local4)

// save Local4 object type value into Local2
Store (ObjectType (Local4), Local2)

// validate Local4 is a Package
If (LNotEqual (Local2, 4)) // Package type is 4
  { Return (8) } // failure

Store ("DerefOf(Index(TIM0,1)),... PASS again", Debug)

// again, validate following produces a nested package
Store (DerefOf (Index (TIM0, 1, )), Local4)

// save Local4 object type value into Local2
Store (ObjectType (Local4), Local2)

// validate Local4 is a Package
If (LNotEqual (Local2, 4)) // Package type is 4
  { Return (9) } // failure

Store ("DerefOf(Index(TIM0,1)),... PASS again", Debug)

// test nested DerefOf(Index) operators
Store (DerefOf (Index (DerefOf (Index (TIM0, 1, )), Local0, )), Local1)

// save Local1 object type value into Local2
Store (ObjectType (Local1), Local2)

// validate Local1 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
  { Return (10) } // failure

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local1, 0))
  { Return (11) } // failure

Store ("DerefOf(Index(DerefOf(Index(TIM0,1)),... PASS", Debug)

// again, validate following produces a nested package
Store (DerefOf (Index (TIM0, 1, )), Local4)

// save Local4 object type value into Local2

```

```

Store (ObjectType (Local4), Local2)

// validate Local4 is a Package
If (LNotEqual (Local2, 4)) // Package type is 4
  { Return (12) } // failure

Store ("DerefOf(Index(TIM0,1)),... PASS again", Debug)

// retest nested DerefOf(Index) operators
Store (DerefOf (Index (DerefOf (Index (TIM0, 1, )), Local0, )), Local1)

// save Local1 object type value into Local2
Store (ObjectType (Local1), Local2)

// validate Local1 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
  { Return (13) } // failure

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local1, 0))
  { Return (14) } // failure

Store ("DerefOf(Index(DerefOf(Index(TIM0,1)),... PASS again", Debug)

// again, validate following produces a nested package
Store (DerefOf (Index (TIM0, 1, )), Local4)

// save Local4 object type value into Local2
Store (ObjectType (Local4), Local2)

// validate Local4 is a Package
If (LNotEqual (Local2, 4)) // Package type is 4
  { Return (15) } // failure

Store ("DerefOf(Index(TIM0,1)),... PASS again", Debug)

Return (0) // pass
} // TEST
} // MTCH

//
// test WhileBrk.asl
//
// This code tests the Break term and While term
//

```

```

// Syntax of Break term
//   BreakTerm := Break
// The break operation causes the current package execution to complete.
//
// Syntax of While Term
//   WhileTerm := While(
//     Predicate //TermArg=>Integer
//   ) {TermList}
// Predicate is evaluated as an integer.
// If the integer is non-zero, the list of terms in TermList is executed.
// The operation repeats until the Predicate evaluates to zero.
//
// MTL NOTE: This test has been modified to reflect ACPI 2.0 break
// NOTE: This test, when run under the MS ACPI.SYS grinds the system to
// a halt.
//
Device (WHLB)
{
    Name (CNT0, 0)
    Name (CNT1, 0)

    Method (TEST)
    {
        // Check Break statement nested in If nested in While nested in
        // While only exits inner-most While loop
        Store (0, CNT0)

        While (LLess (CNT0, 4))
        {
            Store (0, CNT1)
            While (LLess (CNT1, 10))
            {
                if (LEqual (CNT1, 1))
                {
                    Break // exit encompassing loop
                }

                Increment (CNT1)
            }

            If (LNotEqual (CNT1, 1))
            {
                // failure
                Return (7)
            }

            Increment (CNT0)
        }
    }
}

```

```

// Verify Break only exited inner-most While loop

If (LNotEqual (CNT0, 4))
{
    // failure
    Return (8)
}

Store ("While/While/If/Break PASS", Debug)

Store ("+++++++ WhileBrk Test", Debug)

// Check Break statement nested in While
Store (0, CNT0)

While (LLess (CNT0, 10))
{
    Break    // exit encompassing package
    Increment (CNT0)
}

If (LNotEqual (CNT0, 0)) // instruction after Break executed
{
    Return (4)
}

Store (0, CNT0)

// Test While Term
While (LLess (CNT0, 10))
{
    Increment (CNT0)
}

// Check if the while loop was executed until the condition is satisfied.
If (LNotEqual (CNT0, 10))
{
    Return (1)
}

// While loop in a reverse order
While (LGreater (CNT0, 0))
{
    Decrement (CNT0)
}

```

```

// Check if the while loop was executed until the condition is satisfied.
If (LNotEqual (CNT0, 0))
{
    Return (2)
}

Store ("While/Break PASS", Debug)

// Check Break statement nested in If nested in While
Store (0, CNT0)

While (LLess (CNT0, 10))
{
    if (LEqual (CNT0, 5))
    {
        Break    // exit encompassing Package (If)

        // if we execute the next instruction,
        // Break did not exit the loop
        Store (20, CNT0) // exit While loop with value larger
                        // than above
    }

    Increment (CNT0) // check if Break exited both If and While
} // While

If (LGreater (CNT0, 19))
{ // instruction after Break inside IfOp executed
    Return (5)
}

//
// Break will exit out of the while loop, therefore
// the CNT0 counter should still Increment until 5
//
If (LNotEqual (CNT0, 5))
{ // instruction after Break inside WhileOp executed
    Return (6)
}
Store ("While/If/Break PASS", Debug)

// All the conditions passed
Return (0)
} // TEST

```

```

} // WHLB

//
// test IndexOp2.asl
//
// Additional IndexOp test cases to support ACPICMCMB (control method battery
// test) on Toshiba Portege 7020CT. Test cases include appropriate bit
// shifting of Field elements and reading Field elements greater than 64 bits.
//
// MTL NOTE: This test has been modified slightly from the original test
// to take into account ACPI specification limitations.
//
Scope (\_SB) // System Bus
{ // _SB system bus

    Device (MEM)
    { // MEM
        Name (_HID, 0x010CD041)
        Name (_STA, 0x0F)

        OperationRegion (SMEM, SystemMemory, 0x800000, 0x100)
        Field (SMEM, AnyAcc, NoLock, Preserve)
        { // Field: SMEM overlay using 32-bit field elements
            SMD0, 32, // 32-bits
            SMD1, 32, // 32-bits
            SMD2, 32, // 32-bits
            SMD3, 32 // 32-bits
        } // Field: SMEM overlay using 32-bit field elements
        Field (SMEM, AnyAcc, NoLock, Preserve)
        { // Field: SMEM overlay using greater than 32-bit field elements
            SME0, 69, // larger than an integer (32 or 64)
            SME1, 97 // larger than an integer
        } // Field: SMEM overlay using greater than 32-bit field elements

        OperationRegion (SRAM, SystemMemory, 0x100B0000, 0xF000)
        Field (SRAM, AnyAcc, NoLock, Preserve)
        { // Field: SRAM overlay
            , 0x34000, // skip
            IEAX, 0x20,
            IEBX, 0x20,
            IECX, 0x20,
            IEDX, 0x20,
            IESI, 0x20,
            IEDI, 0x20,
            IEBP, 0x20,
            , 0x20,
            OEAX, 0x20,

```

OEBX, 0x20,
OECX, 0x20,
OEDX, 0x20,
OESI, 0x20,
OEDI, 0x20,
OEBP, 0x20,
 , 0x618, // skip
ACST, 1,
BES1, 1,
BES2, 1,
 , 5, // skip
BMN1, 0x68,
BSN1, 0x58,
BTP1, 0x48,
BPU1, 0x20,
BDC1, 0x20,
BLF1, 0x20,
BTC1, 0x20,
BDV1, 0x20,
BST1, 0x20,
BPR1, 0x20,
BRC1, 0x20,
BPV1, 0x20,
 , 0x20,
BCW1, 0x20,
BCL1, 0x20,
BG11, 0x20,
BG21, 0x20,
BOI1, 0x20,
 , 0x530, // skip
BMN2, 0x68,
BSN2, 0x58,
BTP2, 0x48,
BPU2, 0x20,
BDC2, 0x20,
BLF2, 0x20,
BTC2, 0x20,
BDV2, 0x20,
BST2, 0x20,
BPR2, 0x20,
BRC2, 0x20,
BPV2, 0x20,
 , 0x20,
BCW2, 0x20,
BCL2, 0x20,
BG12, 0x20,
BG22, 0x20,
BOI2, 0x20,

```
, 0x518, // skip
AC01, 0x10,
AC11, 0x10,
PSV1, 0x10,
CRT1, 0x10,
TMP1, 0x10,
AST1, 0x10,
AC21, 0x10,
AC31, 0x10,
AC02, 0x10,
AC12, 0x10,
PSV2, 0x10,
CRT2, 0x10,
TMP2, 0x10,
AST2, 0x10,
AC22, 0x10,
AC32, 0x10,
AC03, 0x10,
AC13, 0x10,
PSV3, 0x10,
CRT3, 0x10,
TMP3, 0x10,
AST3, 0x10,
AC23, 0x10,
AC33, 0x10,
, 0x80, // skip
TMPF, 0x10,
, 0x570, // skip
FANH, 1,
FANL, 7,
TF11, 1,
TF21, 1,
TF31, 1,
, 1,
TF10, 1,
TF20, 1,
TF30, 1,
, 1,
TP11, 1,
TP21, 1,
TP31, 1,
, 0x6D, // 109
GP50, 1,
GP51, 1,
GP52, 1,
GP53, 1,
, 4,
GP60, 1,
```


GP61, 1,
GP62, 1,
GP63, 1,
GP64, 1,
GP65, 1,
GP66, 1,
 , 1,
GP70, 1,
GP71, 1,
GP72, 1,
GP73, 1,
GP74, 1,
GP75, 1,
GP76, 1,
 , 1,
WED0, 1,
WED1, 1,
WED2, 1,
WED3, 1,
WED4, 1,
 , 3,
SBL0, 1,
SBL1, 1,
SBL2, 1,
SBL3, 1,
 , 4,
LIDS, 1,
VALF, 1,
 , 2,
DCKI, 1,
DCKF, 1,
BT1F, 1,
BT2F, 1,
 , 0x7D0, // skip
HKCD, 8,
 , 8,
DLID, 0x20,
DSRN, 0x20,
 , 0x20,
BDID, 0x20,
DSPW, 1,
VGAF, 1,
VWE0, 1,
VWE1, 1,
PPSC, 1,
SPSC, 1,
EWLD, 1,
EWPS, 1,

```

    , 0x1768, // skip
    PRES, 0x8000
} // Field: SRAM overlay
} // MEM

Device (BAT1)
{ // BAT1
    Name (_HID, EISAID ("PNP0C0A")) // Control Method Battery ID
    Name (_UID, 1)
    Name (_PCL, Package (1) {\_SB})

    Method (_STA)
    { // _STA
        If (\_SB.MEM.BES1)
            { Return (0x1F) } // battery present
        Else
            { Return (0x0F) } // battery not present
    } // _STA

    Method (_BIF)
    { // _BIF
        Name (BUFR, Package (13) {})

        Store (\_SB.MEM.BPU1, Index (BUFR, 0))
        Store (\_SB.MEM.BDC1, Index (BUFR, 1))
        Store (\_SB.MEM.BLF1, Index (BUFR, 2))
        Store (\_SB.MEM.BTC1, Index (BUFR, 3))
        Store (\_SB.MEM.BDV1, Index (BUFR, 4))
        Store (\_SB.MEM.BCW1, Index (BUFR, 5))
        Store (\_SB.MEM.BCL1, Index (BUFR, 6))
        Store (\_SB.MEM.BG11, Index (BUFR, 7))
        Store (\_SB.MEM.BG21, Index (BUFR, 8))
        Store (\_SB.MEM.BMN1, Index (BUFR, 9))
        Store (\_SB.MEM.BSN1, Index (BUFR, 10))
        Store (\_SB.MEM.BTP1, Index (BUFR, 11))
        Store (\_SB.MEM.BOI1, Index (BUFR, 12))

        Return (BUFR)
    } // _BIF
} // BAT1

Device (IDX2)
{
    Method (B2IB)
    { // B2IB: store from Buffer into Index'ed Buffer

        Name (SRCB, Buffer () {"Short Buffer"}) // 12 characters plus NULL
    }
}

```

```

Name (DEST, Buffer () // 62 characters plus NULL
    {"Destination buffer that is longer than the short source buffer"})

// verify object type returned by Index(Buffer,Element,)

Store (Index (DEST, 2, ), Local1)
Store (ObjectType (Local1), Local2)

If (LNotEqual (Local2, 14)) // Buffer Field is type 14
{
    // Local2 indicates Local1 is not a Buffer Field

    Return (0x61)
}

// verify object type and value returned by DerefOf(Index(Buffer,Element,))
// should return Number containing element value

Store (DerefOf (Local1), Local3)
Store (ObjectType (Local3), Local4)

If (LNotEqual (Local4, 1)) // Number is type 1
{
    // Local2 indicates Local1 is not a Number
    Return (0x62)
}
Else
{
    If (LNotEqual (Local3, 0x73)) // expect 's' element from DEST
    {
        Return (0x63)
    }
}

Store ("DerefOf(Index(Buffer,)) PASS", Debug)

//
// The following sections have been rewritten because storing into
// an Indexed buffer only changes one byte - the FIRST byte of the
// buffer is written to the source index. This is the ONLY byte
// written -- as per ACPI 2.0
//
// Overwrite DEST contents, at buffer position 2 [only]

Store (SRCB, Index (DEST, 2, ))

```

```

//
// Check that the next byte is not changed
//
Store (DerefOf (Index (DEST, 3, )), Local0)
If (LNotEqual (Local0, 0x74)) // 't'
{
    // DEST element is not matching original value
    If (LEqual (Local0, 0x68))
    {
        // DEST element was altered to 'h'
        Return (0x68)
    }
    Else
    {
        // DEST element is an unknown value
        Return (0x69)
    }
}

//
// Check that the elements beyond the SRCB buffer copy
// have not been altered.
//
Store (DerefOf (Index (DEST, 14)), Local0)

//
// This should be an 'f'.
//
If (LNotEqual (Local0, 0x66))
{
    // DEST element was zero'd by buffer copy
    If (LEqual (Local0, 0))
    {
        // DEST element is zero
        Return (0x6A)
    }
    Else
    {
        // DEST element is unknown value
        Return (0x6B)
    }
}

Store ("Store(SRCB,Index(Buffer,)) PASS", Debug)

//
// verify altering SRCB does NOT alter DEST
//

```

```

Store (0x6A, Index (SRCB, 1)) // SRCB = "Sjort Buffer"

Store (DerefOf (Index (SRCB, 1)), Local0)

If (LNotEqual (Local0, 0x6A)) // 'j'
{
    // SRCB element is unaltered
    Return (0x71)
}

Store (DerefOf (Index (DEST, 3)), Local0) // DEST = "Destination buffer that..."

If (LNotEqual (Local0, 0x74)) // 't'
{
    // DEST element is altered
    If (LEqual (Local0, 0x6A)) // 'j'
    {
        // SRCB change altered DEST element
        Return (0x72)
    }
    Else
    {
        // DEST element is unknown value
        Return (0x73)
    }
}

// verify altering DEST does NOT alter SRCB

Store (0x6B, Index (DEST, 4, )) // DEST = "DeSkination buffer..."

Store (DerefOf (Index (DEST, 4, )), Local0)

If (LNotEqual (Local0, 0x6B)) // 'k'
{
    // DEST element is unaltered
    Return (0x74)
}

Store (DerefOf (Index (SRCB, 2, )), Local0)

If (LNotEqual (Local0, 0x6F)) // 'o'
{ // SRC element is altered
    If (LEqual (Local0, 0x6B)) // 'k'
    {
        // DEST change altered SRCB element
        Return (0x75)
    }
}

```

```

Else
{
    // SRCB element is unknown value
    Return (0x76)
}
}

Store ("SRCB and DEST independent PASS", Debug)

// verify string can be written to Index target/destination
// Only FIRST byte is written

Store ("New Buff", Index (DEST, 2, )) // DEST = "DeNkination buffer..."

Store (DerefOf (Index (DEST, 2, )), Local0)

If (LNotEqual (Local0, 0x4E)) // 'N'
{
    // DEST element is unaltered
    Return (0x81)
}

Store (DerefOf (Index (DEST, 6, )), Local0)

If (LNotEqual (Local0, 0x61)) // 'a'
{
    // DEST element is unaltered
    Return (0x82)
}

Store (DerefOf (Index (DEST, 10, )), Local0)

If (LNotEqual (Local0, 0x6E)) // 'n'
{
    // DEST element is unaltered
    Return (0x83)
}

Store ("Store(String,Index) PASS", Debug)

Return (0) // pass
} // B2IB: store from Buffer into Index'ed Buffer

Method (FB2P)
{ // FB2P: store from Field Buffer into Index'ed Package
    Name (DEST, Package (2) { })

```

```

// initialize memory using 32-bit field elements
Store (0x01234567, \_SB.MEM.SMD0)
Store (0x89ABCDEF, \_SB.MEM.SMD1)
Store (0xFEDCBA98, \_SB.MEM.SMD2)
Store (0x76543210, \_SB.MEM.SMD3)

// move greater than 64-bit buffers into DEST package
Store (\_SB.MEM.SME0, Index (DEST, 0))
Store (\_SB.MEM.SME1, Index (DEST, 1))

// validate DEST contents
Store (DerefOf (Index (DEST, 0, )), Local0)
Store (DerefOf (Index (DEST, 1, )), Local1)

// verify Local0 and Local1 are Buffers
Store (ObjectType (Local0), Local2)
if (LNotEqual (Local2, 3)) // Buffer type is 3
{
    Return (0x11)
}

Store (ObjectType (Local1), Local3)
if (LNotEqual (Local3, 3)) // Buffer type is 3
{
    Return (0x12)
}

// validate DEST buffer contents
Store (DerefOf (Index (DerefOf (Index (DEST, 0)), 0)), Local4)
If (LNotEqual (Local4, 0x67))
{
    Return (0x13)
}

Store (DerefOf (Index (DerefOf (Index (DEST, 0)), 1)), Local4)
If (LNotEqual (Local4, 0x45))
{
    Return (0x14)
}

Store (DerefOf (Index (DerefOf (Index (DEST, 0)), 4)), Local4)
If (LNotEqual (Local4, 0xEF))
{
    Return (0x15)
}

Store (DerefOf (Index (DerefOf (Index (DEST, 0, )), 5, )), Local4)

```

```

If (LNotEqual (Local4, 0xCD))
{
    Return (0x16)
}

Store ("Store(Mem,PkgElement) PASS", Debug)

// validate changing source \_SB.MEM.SMD* does not impact DEST
Store (0x12345678, \_SB.MEM.SMD0)

Store (DerefOf (Index (DerefOf (Index (DEST, 0, )), 0, )), Local5)
If (LNotEqual (Local5, 0x67))
{
    Return (0x21)
}

Store (DerefOf (Index (DerefOf (Index (DEST, 0, )), 1, )), Local5)
If (LNotEqual (Local5, 0x45))
{
    Return (0x22)
}

// validate changing DEST does not impact source \_SB.MEM.SMD*
Store (0x30, Index (DerefOf (Index (DEST, 0)), 0))

Store (DerefOf (Index (DerefOf (Index (DEST, 0)), 0)), Local5)
If (LNotEqual (Local5, 0x30))
{
    Return (0x23)
}

//
// This section was modified from the original iPCO code because
// it attempted to compare two buffers. This is not allowed until
// ACPI v2.0, so the test has been modified to just check the
// changed \_SB.MEM.SMD0
//
Store (\_SB.MEM.SMD0, Local5)

If (LNotEqual (Local5, 0x12345678))
{
    Return (0x24)
}

Store ("Mem and Pkg independent PASS", Debug)

```



```

Return (0)
} // FB2P: store from Field Buffer into Index'ed Package

Method (TEST)
{
    Store ("+++++++ IndexOp2 Test", Debug)

    // store _BIF package return value into Local0

    Store (\_SB.BAT1._BIF, Local0)

    // save Local0 object type value into Local1
    Store (ObjectType (Local0), Local1)

    // validate Local0 is a Package
    If (LNotEqual (Local1, 4)) // Package type is 4
    {
        // failure
        Return (2)
    }

    // validate source and destination buffers are independent of each
    // of each other (i.e., changing one's contents does not change
    // other's contents) using B2IB (store from Buffer into Index'ed
    // Buffer) and FB2P (store from Field Buffer into Index'ed Package)

    // call B2IB (store from Buffer into Index'ed Buffer)
    Store (B2IB, Local2) // Local2 is B2IB return value

    // save Local2 object type value into Local3
    Store (ObjectType (Local2), Local3)

    // validate Local2 is a Number
    If (LNotEqual (Local3, 1)) // Number type is 1
    {
        // failure
        Return (4)
    }

    // zero indicates pass, non-zero is an error code
    If (LNotEqual (Local2, 0))
    {
        // return B2IB error code
        Return (Local2)
    }

    // call FB2P (store from Field Buffer into Index'ed Package)
    Store (FB2P, Local2) // Local2 is FB2P return value

```

```

// save Local2 object type value into Local3
Store (ObjectType (Local2), Local3)

// validate Local2 is a Number
If (LNotEqual (Local3, 1)) // Number type is 1
{
    // failure
    Return (5)
}

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local2, 0))
{
    // return FB2P error code
    Return (Local2)
}

Return (0)
} // TEST
} // IDX2: Test device name
} // _SB system bus

//
// test SizeOf.asl
//
// Test for SizeOf
// test cases include following SizeOf arguments:
//     buffer, buffer field;
//     control method argument, control method local variable;
//     control method return values;
//     direct string, string;
//     package;
//     buffer, package, and string package elements
//
// MTL NOTE: This test has been modified to remove any SizeOf(Index(Buff,...
// calls because it is not legal to perform a SizeOf operation on a Buffer Field.
// This test has also been extended to test additional Package element sizes.
//
Device (SIZO)
{
    // SAR0 control method validates SizeOf(Arg)
    // SAR0 should only be called by SARG
    Method (SAR0, 2)
    // Arg0 object to determine size of
    // Arg1 expected Arg length
    { // SAR0: SizeOf(Arg) test control method

```

```

// Local0 Arg0 length
// Local1 Local0 object type

// Store first string size (Arg0) into Local7
Store (SizeOf (Arg0), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
    { Return (0x21) }

// If strings are not of equal size, return error code
If (LNotEqual (Local0, Arg1))
    { Return (0x22) }

Return (0)
} // SAR0: SizeOf(Arg) test control method

Method (SARG)
{ // SARG: SizeOf(Arg) test control method
    Name (BUFR, Buffer (12) {}) // uninitialized Buffer
    Name (BUF1, Buffer() {0x01, 0x02, 0x03, 0x04, 0x05})
    Name (PKG0, Package (4) {}) // uninitialized Package
    Name (STR0, "String")
    Name (PKG1, Package (4)
    {
        BUFR,
        "String2",
        STR0,
        PKG0
    }) // PKG1

    Name (PKG2, Package (4)
    {
        Buffer (15) {},
        "String 1",
        Package (2) {}
    }) // PKG2

// Namespace entry buffer reference
Store (SAR0 (BUFR, 12), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number

```

```

If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x23)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=BUFR) PASS", Debug)

// Namespace entry package reference
Store (SAR0 (PKG0, 4), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x24)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=PKG0) PASS", Debug)

// Namespace entry string reference
Store (SAR0 (STR0, 6), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x25)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

```

```

}

Store ("SizeOf(Arg=STR0) PASS", Debug)

// direct string reference
Store (SAR0 ("String", 6), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x26)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=String) PASS", Debug)

Store (0x55, Index (BUF1, 2))

/*****
//
// This section is commented because it is illegal to
// perform a SizeOf operation on a Buffer Field
//
// Namespace BufferField reference
Store (SAR0 (Index (BUFR, 2, ), 10), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{ Return (0x27) }

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{ Return (Local0) }

Store ("SizeOf(Arg=BufferField) PASS", Debug)
*****/

// Namespace BufferPackageElement reference

```

```

//
Store (SAR0 (Index(PKG1, 0), 12), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x28)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=PackageBuffer NTE Reference Element) PASS", Debug)

// Namespace StringPackageElement reference
Store (SAR0 (Index (PKG1, 1, ), 7), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x29)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=Package String Element) PASS", Debug)

// Namespace StringPackageElement reference
Store (SAR0 (Index (PKG1, 2, ), 6), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1

```

```

{
    Return (0x2A)
}

If (LNotEqual (Local0, 0))    // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=Package String NTE Reference Element) PASS", Debug)

// Namespace PackagePackageElement reference
Store (SAR0 (Index (PKG1, 3, ), 4), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1))    // Number type is 1
{
    Return (0x2B)
}

If (LNotEqual (Local0, 0))    // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=Package Package NTE Reference Element) PASS", Debug)

// Package Buffer Element
Store (SAR0 (Index (PKG2, 0), 15), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1))    // Number type is 1
{
    Return (0x2B)
}

If (LNotEqual (Local0, 0))    // Local0 is SAR0 return error code
{
    Return (Local0)
}

```

```

Store ("SizeOf(Arg=Package Buffer Element) PASS", Debug)

// Package String Element
Store (SAR0 (Index (PKG2, 1), 8), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x2B)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=Package String Element) PASS", Debug)

// Package Package Element
Store (SAR0 (Index (PKG2, 2), 2), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x2B)
}

If (LNotEqual (Local0, 0)) // Local0 is SAR0 return error code
{
    Return (Local0)
}

Store ("SizeOf(Arg=Package Package Element) PASS", Debug)

Store ("SizeOf(Arg) PASS", Debug)

Return (0)
} // SARG: SizeOf(Arg) test control method

Method (SBUF)
{ // SBUF: SizeOf(Buffer) test control method
    Name (BUFR, Buffer (12) {})

```



```

// store size of BUFR buffer into Local0
Store (SizeOf (BUFR), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x31)
}

If (LNotEqual (Local0, 12)) // BUFR size is 12
{
    Return (0x32)
}

Store ("SizeOf(BUFR) PASS", Debug)

Return (0)
} // SBUF: SizeOf(Buffer) test control method

/*****
//
// This section is commented because it is illegal to
// perform a SizeOf operation on a Buffer Field
//
Method (SIND)
{ // SIND: SizeOf(Index(,)) test control method
    Name (BUFR, Buffer (12) {})

    // store size of Index(BUFR,2,) buffer into Local0
    Store (SizeOf (Index (BUFR, 2, )), Local0)

    // save Local0 object type value into Local1
    Store (ObjectType (Local0), Local1)

    // validate Local0 is a Number
    If (LNotEqual (Local1, 1)) // Number type is 1
    {
        Return (0x41)
    }

    If (LNotEqual (Local0, 10)) // 12 - 2 = 10
    {
        Return (0x42)
    }
}

```

```

}

Store ("SizeOf(Index(BUFR,,)) PASS", Debug)

// TBD: strings and packages

Return (0)
} // SIND: SizeOf(Index(,,)) test control method
*****/

Method (SLOC)
{ // SLOC: SizeOf(Local) test control method
  Name (BUFR, Buffer (12) {}) // uninitialized Buffer
  Name (STR0, "String")
  Name (PKG0, Package (4) {}) // uninitialized Package

  // store BUFR Buffer into Local2
  Store (BUFR, Local2)

  // store size of BUFR buffer into Local0
  Store (SizeOf (Local2), Local0)

  // save Local0 object type value into Local1
  Store (ObjectType (Local0), Local1)

  // validate Local0 is a Number
  If (LNotEqual (Local1, 1)) // Number type is 1
  {
    Return (0x51)
  }

  If (LNotEqual (Local0, 12)) // BUFR size is 12
  {
    Return (0x52)
  }

  Store ("SizeOf(Local2=Buffer) PASS", Debug)

  // store STR0 string into Local2
  Store (STR0, Local2)

  // store size of STR0 buffer into Local0
  Store (SizeOf (Local2), Local0)

  // save Local0 object type value into Local1
  Store (ObjectType (Local0), Local1)
}

```

```

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x53)
}

If (LNotEqual (Local0, 6)) // STR0 size is 6
{
    Return (0x54)
}

Store ("SizeOf(Local2=String) PASS", Debug)

// store PKG0 Package into Local2
Store (PKG0, Local2)

// store size of PKG0 buffer into Local0
Store (SizeOf (Local2), Local0)

// save Local0 object type value into Local1
Store (ObjectType (Local0), Local1)

// validate Local0 is a Number
If (LNotEqual (Local1, 1)) // Number type is 1
{
    Return (0x55)
}

If (LNotEqual (Local0, 4)) // PKG0 size is 4
{
    Return (0x56)
}

Store ("SizeOf(Local2=Package) PASS", Debug)

Return (0)
} // SLOC: SizeOf(Local) test control method

Method (TEST)
{
    Store ("+++++++ SizeOf Test", Debug)

    // Store current operating system string into Local0
    Store (_OS, Local0)

```

```

Store (SizeOf (_OS), Local3)

// save Local3 object type value into Local4
Store (ObjectType (Local3), Local4)

// validate Local3 is a Number
If (LNotEqual (Local4, 1)) // Number type is 1
{
    // failure
    Return (0x61)
}

// Store current operating system string into Local0
// This verifies above SizeOf(_OS) did not corrupt ACPI namespace
Store (_OS, Local0)

// Store SARG [Validate SizeOf(Arg)] return value into Local1
Store (SARG, Local1)

// save Local1 object type value into Local2
Store (ObjectType (Local1), Local2)

// validate Local1 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
{
    // failure
    Return (0x62)
}

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local1, 0))
{
    // return SARG error code
    Return (Local1)
}

// Store SBUF [Validate SizeOf(Buffer)] return value into Local1
Store (SBUF, Local1)

// save Local1 object type value into Local2
Store (ObjectType (Local1), Local2)

// validate Local1 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
{
    // failure
    Return (0x63)
}

```

```

}

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local1, 0))
{
    // return SBUF error code
    Return (Local1)
}

/*****
//
// This section is commented because it is illegal to
// perform a SizeOf operation on a Buffer Field
//
// Store SIND [verify SizeOf(Index(,))] return value into Local1
Store (SIND, Local1)

// save Local1 object type value into Local2
Store (ObjectType (Local1), Local2)

// validate Local1 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
{
    // failure
    Return (0x64)
}

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local1, 0))
{
    // return SARG error code
    Return (Local1)
}
*****/

// Store SLOC [verify SizeOf(Local)] return value into Local1
Store (SLOC, Local1)

// save Local1 object type value into Local2
Store (ObjectType (Local1), Local2)

// validate Local1 is a Number
If (LNotEqual (Local2, 1)) // Number type is 1
{
    // failure
    Return (0x65)
}

```

```

// zero indicates pass, non-zero is an error code
If (LNotEqual (Local1, 0))
{
    // return SLOC error code
    Return (Local1)
}

// TBD:  SizeOf (METH) -- where METH control method returns
//        buffer, BufferField, string, package, package element

    Return (0)
} // TEST
} // SIZO

//
// test SmiShare.asl
//
Scope (\_SB) // System Bus
{ // _SB system bus
    // Declare an OpRegion in Memory starting at offset 0x400000 that is 10 bytes long
    OperationRegion(RAM1, SystemMemory, 0x400000, 0xA)

    Field (RAM1, AnyAcc, NoLock, Preserve)
    {
        BI1T, 1, // Create some bits in memory to access
        BI2T, 2,
        BI3T, 3,
        LST2, 2
    } // End Field RAM1

    Field (RAM1, WordAcc, NoLock, WriteAsZeros)
    {
        WRD, 16
    } // End 2nd Field RAM1

    Field (RAM1, ByteAcc, NoLock, WriteAsOnes)
    {
        BYTE, 8
    } // End 3rd Field RAM1

    Field (RAM1, ByteAcc, NoLock, Preserve)
    {
        SMIC, 8,
        SMID, 8
    }
}

```

```

Device (MBIT)
{
    Method (_INI)
    {
        Store (0, BI1T)
        Store (3, BI2T)
        Store (7, BI3T)
        Store (0, LST2)
    } // End _INI Method
} // End Device MBIT

```

```

Device (MWRD)
{
    Method (_INI)
    {
        Store (0, WRD)
    } // End _INI Method
} // End Device MWRD

```

```

Device (MBYT)
{
    Method (_INI)
    {
        Store (0, BYTE)
        Store (0xC, SMIC)
        Store (0xD, SMID)
    } // End _INI Method
} // End Device MBYT

```

```

/*
// Declare an OpRegion in Memory starting at offset 0x400000 that is 10 bytes long
OperationRegion(\RAM1, SystemMemory, 0x400000, 0xA)

```

```

Field (\RAM1, AnyAcc, NoLock, Preserve)
{
    BI1T, 1, // Create some bits in memory to access
    BI2T, 2,
    BI3T, 3,
    LST2, 2
} // End Field RAM1

```

```

Field (\RAM1, WordAcc, NoLock, WriteAsZeros)
{
    WRD, 16
} // End 2nd Field RAM1

```

```

Field (\RAM1, ByteAcc, NoLock, WriteAsOnes)
{

```

```

    BYTE, 8
} // End 3rd Field RAM1

Field (\RAM1, ByteAcc, NoLock, Preserve)
{
    SMIC, 8,
    SMID, 8
}
*/

Method (SMIX)
{
    Return (BYTE)
} // End SMIX

Method (EVNT)
{
    Store (SMIX, Local0)

    If (And (Local0, 0x01))
    { Notify (\_SB_.SMIS, 0x21) }

    If (And (Local0, 0x02))
    { Notify (\_SB_.SMIS, 0x22) }

    If (And (Local0, 0x04))
    { Notify (\_SB_.SMIS, 0x24) }

    If (And (Local0, 0x08))
    { Notify (\_SB_.SMIS, 0x28) }

} // End Method EVNT

Device (SMIS)
{
    Method (BINK)
    {
        Store (0, Local0) // Zero out Local0

        If (LNotEqual (SMID, 0xD))
        { Or (0x80, Local0, Local0) }

        If (LNotEqual (SMIC, 0xC))
        { Or (0x40, Local0, Local0) }

        If (LNotEqual (BYTE, 0))
        { Or (0x20, Local0, Local0) }

        If (LNotEqual (WRD, 0))

```



```

    { Or (0x10, Local0, Local0)}

    If (LNotEqual (LST2, 0))
    { Or (0x8, Local0, Local0)}

    If (LNotEqual (BI3T, 0x7))
    { Or (0x4, Local0, Local0)}

    If (LNotEqual (BI2T, 0x3))
    { Or (0x2, Local0, Local0)}

    If (LNotEqual (BI1T, 0))
    { Or (0x1, Local0, Local0)}

    Return (Local0)
} // End Method BINK

Method (TEST)
{
    Store ("+++++++ SmiShare Test", Debug)

    // Expect EVNT to generate Notify value we just previously
    // stored in BYTE
    Store (0x20, BYTE)
    EVNT ()
    Store (0x21, BYTE)
    EVNT ()
    Store (0x22, BYTE)
    EVNT ()
    Store (0x23, BYTE)
    EVNT ()

    Return (0) // pass
} // End Method TEST
} // Device SMIS

Device(CNDT)
{
    Method(TEST)
    {
        If (ECOK)
        {
            return("Broken")
        }
        Else
        {
            return("Works")
        }
    }
}

```

```

    }

    Method(ECOK)
    {
        Return(0x0)
    }
}

} // _SB system bus

```

/* Test a very big buffer */

```

Name(WQAB, Buffer(6756)
{
    0x46,0x4F,0x4D,0x42,0x01,0x00,0x00,0x00,
    0x54,0x1A,0x00,0x00,0xBA,0xAD,0x00,0x00,
    0x44,0x53,0x00,0x01,0x1A,0x7D,0xDA,0x54,
    0x98,0xBD,0x92,0x00,0x01,0x06,0x18,0x42,
    0x10,0x47,0x10,0x92,0x46,0x62,0x02,0x89,
    0x80,0x90,0x18,0x18,0x14,0x81,0x85,0x00,
    0x49,0x02,0x88,0xC4,0x41,0xE1,0x20,0xD4,
    0x9F,0x40,0x7E,0x05,0x20,0x74,0x28,0x40,
    0xA6,0x00,0x83,0x02,0x9C,0x22,0x88,0xA0,
    0x57,0x01,0x36,0x05,0x98,0x14,0x60,0x51,
    0x80,0x76,0x01,0x96,0x05,0xE8,0x16,0x20,
    0x1D,0x96,0x88,0x04,0x47,0x89,0x01,0x47,
    0xE9,0xC4,0x16,0x6E,0xD8,0xE0,0x85,0xA2,
    0x68,0x06,0x51,0x12,0x94,0x8B,0x20,0x5D,
    0x10,0x52,0x2E,0xC0,0x37,0x82,0x06,0x10,
    0xA5,0x77,0x01,0xB6,0x05,0x98,0x86,0x27,
    0xD2,0x20,0xE4,0x60,0x08,0x54,0xCE,0x80,
    0x20,0x69,0x44,0x21,0x1E,0xA7,0x44,0x08,
    0x0A,0x84,0x90,0xD4,0xF1,0xA0,0xA0,0x71,
    0x88,0xAD,0xCE,0x46,0x93,0xA9,0x74,0x7E,
    0x48,0x82,0x70,0xC6,0x2A,0x7E,0x3A,0x9A,
    0xD0,0xD9,0x9C,0x60,0xE7,0x18,0x72,0x3C,
    0x48,0xF4,0x20,0xB8,0x00,0x0F,0x1C,0x2C,
    0x34,0x84,0x22,0x6B,0x80,0xC1,0x8C,0xDD,
    0x63,0xB1,0x0B,0x4E,0x0A,0xEC,0x61,0xB3,
    0x01,0x19,0xA2,0x24,0x38,0xD4,0x11,0xC0,
    0x12,0x05,0x98,0x1F,0x87,0x0C,0x0F,0x95,
    0x8C,0x25,0x24,0x1B,0xAB,0x87,0xC2,0xA5,
    0x40,0x68,0x6C,0x27,0xED,0x19,0x45,0x2C,
    0x79,0x4A,0x82,0x49,0xE0,0x51,0x44,0x36,
    0x1A,0x27,0x28,0x1B,0x1A,0x25,0x03,0x42,
    0x9E,0x05,0x58,0x07,0x26,0x04,0x76,0x2F,
    0xC0,0x9A,0x00,0x73,0xB3,0x90,0xB1,0xB9,

```

0xE8,0xFF,0x0F,0x71,0xB0,0x31,0xDA,0x9A,
0xAE,0x90,0xC2,0xC4,0x88,0x12,0x2C,0x5E,
0xC5,0xC3,0x10,0xCA,0x93,0x42,0xA8,0x48,
0x95,0xA1,0x68,0xB4,0x51,0x2A,0x14,0xE0,
0x4C,0x80,0x30,0x5C,0x1D,0x03,0x82,0x46,
0x88,0x15,0x29,0x56,0xFB,0x83,0x20,0xF1,
0x2D,0x40,0x54,0x01,0xA2,0x48,0xA3,0x41,
0x9D,0x03,0x3C,0x5C,0x0F,0xF5,0xF0,0x3D,
0xF6,0x93,0x0C,0x72,0x90,0x67,0xF1,0xA8,
0x70,0x9C,0x06,0x49,0xE0,0x0B,0x80,0x4F,
0x08,0x1E,0x38,0xDE,0x35,0xA0,0x66,0x7C,
0xBC,0x4C,0x10,0x1C,0x6A,0x88,0x1E,0x68,
0xB8,0x13,0x38,0x44,0x06,0xE8,0x49,0x3D,
0x52,0x60,0x07,0x77,0x32,0xEF,0x01,0xAF,
0x0A,0xCD,0x5E,0x12,0x08,0xC1,0xF1,0xF8,
0x7E,0xC0,0x26,0x9C,0xC0,0xF2,0x07,0x81,
0x1A,0x99,0xA1,0x3D,0xCA,0xD3,0x8A,0x19,
0xF2,0x31,0xC1,0x04,0x16,0x0B,0x21,0x05,
0x10,0x1A,0x0F,0xF8,0x6F,0x00,0x8F,0x17,
0xBE,0x12,0xC4,0xF6,0x80,0x12,0x0C,0x0B,
0x21,0x23,0xAB,0xF0,0x78,0xE8,0x28,0x7C,
0x95,0x38,0x9C,0xD3,0x8A,0x67,0x82,0xE1,
0x20,0xF4,0x05,0x90,0x00,0x51,0xE7,0x0C,
0xD4,0x61,0xC1,0xE7,0x04,0x76,0x33,0x38,
0x83,0x47,0x00,0x8F,0xE4,0x84,0xFC,0x2B,
0xF1,0xC0,0xE0,0x03,0xE2,0xEF,0x1F,0xA7,
0xEC,0x11,0x9C,0xA9,0x01,0x7D,0x1C,0xF0,
0xFF,0x7F,0x28,0x7C,0x88,0x1E,0xDF,0x29,
0x1F,0xAF,0x4F,0x17,0x96,0x35,0x4E,0xE8,
0x77,0x08,0x9F,0x38,0x7C,0x64,0x71,0x44,
0x08,0x39,0x39,0x05,0xA0,0x81,0x4F,0xF7,
0xEC,0x22,0x9C,0xAE,0x27,0xE5,0x40,0xC3,
0xA0,0xE3,0x04,0xC7,0x79,0x00,0x1C,0xE3,
0x84,0x7F,0x2E,0x80,0x3F,0x40,0x7E,0xCA,
0x78,0xC5,0x48,0xE0,0x98,0x23,0x44,0x9F,
0x6B,0x3C,0x42,0x2C,0xFC,0x53,0x45,0xE1,
0x03,0x21,0x63,0x04,0x17,0xA0,0xC7,0x08,
0x7C,0x03,0x8E,0x11,0x7D,0x94,0xE0,0xEA,
0x0F,0x1A,0x74,0x80,0xB8,0xFF,0xFF,0x00,
0xE1,0x83,0x7A,0x80,0xC0,0x37,0xFA,0xD1,
0x03,0x3D,0x2E,0x8B,0x3E,0x0F,0xC8,0xF8,
0x89,0x46,0xF3,0xE2,0xA7,0x03,0x7E,0xF8,
0x00,0x0F,0xA8,0x87,0x84,0x03,0xC5,0x4C,
0x9B,0x83,0x3E,0xBB,0x1C,0x3A,0x76,0xB8,
0xE0,0x3F,0x81,0x80,0x4B,0xDE,0x21,0x0C,
0x14,0x23,0xC6,0x9F,0x83,0x7C,0x0A,0x03,
0xFF,0xFF,0xFF,0x14,0x06,0xFE,0xE1,0xF0,
0x20,0x4F,0x07,0x9F,0xB6,0xA8,0x74,0x18,

0xD4,0x81,0x0B,0xB0,0x32,0x89,0x08,0xCF,
0x12,0xB5,0x41,0xE8,0xD4,0xF0,0x36,0xF1,
0xB6,0xE5,0x5B,0x40,0x9C,0xD3,0xEC,0xED,
0xC0,0x45,0x30,0x22,0xD4,0x0C,0x45,0x4E,
0x5A,0x11,0x63,0x44,0x79,0xDC,0x32,0xCA,
0xDB,0xD6,0x0B,0x40,0xBC,0x13,0x7B,0xDE,
0x32,0x46,0xF0,0xC8,0x0F,0x5C,0x2C,0xC6,
0xEA,0xF5,0x5F,0xF3,0x81,0x0B,0x70,0xF6,
0xFF,0x3F,0x70,0x01,0x1C,0x0A,0x7A,0x18,
0x42,0x0F,0xC3,0x53,0x39,0x97,0x87,0xC8,
0x53,0x89,0x18,0x35,0x4C,0xD4,0x67,0x28,
0xDF,0x2D,0x7C,0x20,0x02,0xDF,0x99,0x0B,
0xF8,0xFD,0xFF,0x0F,0x44,0x70,0x8E,0x29,
0xB8,0x33,0x0D,0x78,0x7C,0xCE,0x40,0x20,
0xA7,0xE2,0x43,0x0D,0x60,0x41,0xF4,0x13,
0xC2,0x27,0x1A,0x2A,0x13,0x06,0x75,0xA8,
0x01,0xAC,0x5C,0x61,0x9E,0x46,0xCF,0xF9,
0x59,0xC6,0xA7,0x1A,0x1F,0x4A,0x8D,0x63,
0x88,0x97,0x99,0x87,0x1A,0x1F,0x0B,0x5E,
0x49,0x7D,0xA8,0x31,0x54,0x9C,0x87,0x1A,
0x0F,0x37,0x50,0xD4,0x37,0x9B,0x67,0x1B,
0xA3,0xC7,0xF7,0x0D,0xD5,0x10,0x0F,0x35,
0x4C,0xF2,0x4A,0x35,0x16,0x1F,0x6A,0xC0,
0xF1,0xFF,0x3F,0xD4,0x00,0xFC,0xFF,0xFF,
0x1F,0x6A,0x00,0x47,0x47,0x03,0x38,0x47,
0x46,0xDC,0xD1,0x00,0x5C,0x87,0x52,0xE0,
0x70,0x34,0x00,0x1E,0x47,0x21,0x30,0x5F,
0x68,0x7C,0x14,0x02,0x16,0xFF,0xFF,0xA3,
0x10,0xF8,0x65,0x9F,0x83,0x50,0x42,0x8F,
0x42,0x80,0xA0,0xDB,0xCF,0x53,0xC4,0xB3,
0x8F,0x2F,0x3F,0x0F,0x04,0x11,0x5E,0xF3,
0x7D,0x0A,0xF2,0x21,0xDF,0x47,0x21,0x06,
0x63,0x28,0x5F,0x83,0x7C,0x14,0x62,0x50,
0xAF,0x41,0xBE,0xEF,0x1B,0xE4,0xF1,0x22,
0x48,0xEC,0x67,0x02,0x1F,0x85,0x98,0xE8,
0xA3,0x10,0xA0,0xF0,0xFF,0x7F,0x14,0x02,
0xF8,0xFF,0xFF,0x3F,0x0A,0x01,0xCE,0x02,
0x1C,0x0D,0x40,0x37,0xAD,0x47,0x21,0xF0,
0xDE,0x59,0x4E,0xFB,0x04,0x7C,0x16,0x02,
0xCC,0xFE,0xFF,0xCF,0x42,0xC0,0xEC,0x28,
0x74,0x14,0x67,0xF9,0x2A,0xF4,0x04,0xF0,
0x02,0x10,0x23,0xCC,0x3B,0xD0,0x4B,0x26,
0xBB,0x8B,0x1B,0xE7,0xC9,0xE5,0x2C,0x9E,
0xC4,0x7D,0x09,0xF2,0x81,0xE2,0x59,0xC8,
0x50,0xA7,0x1B,0xF4,0x8D,0xDC,0x03,0x8B,
0x19,0x3F,0xC4,0xF3,0x90,0x21,0x9E,0x85,
0x00,0x76,0xFD,0xFF,0xCF,0x42,0x00,0xFF,
0xFF,0xFF,0x47,0x03,0xF8,0x2F,0x00,0x9F,

0x85,0x80,0xE7,0x09,0xE0,0x41,0xDB,0x67,
0x21,0x80,0x33,0x87,0xCB,0xF3,0x7F,0x05,
0x3A,0x96,0xF7,0x08,0xCF,0xFA,0x24,0x5F,
0x2F,0x3D,0xD3,0x87,0x82,0x67,0x21,0x86,
0x75,0x18,0x3E,0x0B,0x31,0x88,0x17,0x4D,
0x43,0xBC,0x70,0xFA,0x30,0xE0,0xFF,0x3F,
0x5E,0xE0,0x57,0x4E,0x03,0x05,0x09,0xF4,
0x2C,0x04,0x30,0xFE,0xFF,0x7F,0x16,0x02,
0xC8,0xB8,0x46,0x9D,0x85,0x80,0xE5,0x6D,
0xE5,0x19,0xDB,0xA7,0x95,0x04,0xFF,0xFF,
0x67,0x21,0xC0,0x41,0x2E,0x23,0x07,0x21,
0x4C,0xC4,0x87,0x83,0x8F,0x99,0x80,0x9E,
0x29,0xBE,0xB8,0x1B,0xE3,0x09,0xE0,0x45,
0xE2,0x31,0x93,0x1D,0x35,0x0D,0xF3,0x2C,
0x64,0xBC,0xB3,0x78,0x0D,0x78,0x82,0xF7,
0xE4,0x9F,0x85,0x18,0xD8,0x61,0x05,0x7B,
0x14,0x32,0xA8,0xC1,0x63,0x87,0x08,0x13,
0xE8,0x59,0x88,0xC5,0x7D,0xAE,0xE8,0x3C,
0xE1,0xB3,0x10,0xF0,0xFE,0xFF,0x9F,0x25,
0xE0,0x5E,0x0D,0x9E,0x85,0x00,0x13,0x87,
0x0D,0x9F,0x35,0xC0,0x33,0x7C,0x8F,0xEA,
0x1C,0x1E,0x8F,0x81,0x7F,0x56,0x1D,0xE7,
0x04,0x96,0x7B,0xD1,0xB2,0x71,0xA0,0xA1,
0x23,0xB2,0x3A,0x20,0x8D,0x0D,0x73,0x29,
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0x39,0x6E,0x50,0x10,0xAA,0x1D,0x84,0x06,
0x05,0xA1,0x39,0xA2,0x80,0xB2,0xEC,0x20,
0x02,0xB2,0x9E,0x2A,0x87,0x0A,0x0A,0x22,
0x30,0xA7,0x02,0xA2,0x49,0x41,0xA8,0x8E,
0x2C,0x47,0x0A,0x9A,0x06,0x84,0x25,0x06,
0xA1,0xC9,0xDA,0x80,0xB0,0x0C,0x75,0x0E,
0x24,0x14,0x84,0xE6,0x04,0xA1,0x4A,0xF2,
0x0C,0x8F,0x82,0xE8,0x38,0x42,0x80,0x68,
0x7A,0x10,0xAA,0xA6,0xCF,0x00,0x28,0x88,
0x06,0x40,0x40,0x68,0x4E,0x30,0xAA,0xA8,
0xD1,0xD1,0x84,0x82,0x50,0xDD,0x2F,0x4E,
0x81,0xF8,0xFF,0x0F,
}) // END MBUF

} //end DefinitionBlock

```

Found in path(s):

* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/tests/misc/grammar.asl

No license file was found, but licenses were detected in source scan.

%{

/*

*/

*

* Module Name: aslcompiler.l - Flex/lex input file

*

*/

/*

*/

*

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*

*****/

```
#include "aslcompiler.h"  
#include "aslcompiler.y.h"
```

```
#include <stdlib.h>  
#include <string.h>  
YYSTYPE AslCompilerIval;
```

```
/*
```

```
* Generation: Use the following command line:  
*  
* flex.exe -PAslCompiler -i -o$(InputPath).c $(InputPath)  
*  
* -i: Scanner must be case-insensitive  
*/
```

```
#define _COMPONENT      ACPI_COMPILER  
      ACPI_MODULE_NAME  ("aslscan")
```

```
/* Local prototypes */
```

```
char  
comment (void);  
char
```

```

comment2 (void);
void
count (int type);
char
literal (void);
void
copy (void);

/*! [Begin] no source code translation */

% }
/* Definitions */

LeadNameChar      [A-Za-z_]
DigitChar          [0-9]
HexDigitChar       [A-Fa-f0-9]
RootChar           [\\]
Nothing            []

NameChar           [A-Za-z_0-9]
NameSeg1           {LeadNameChar}{NameChar}
NameSeg2           {LeadNameChar}{NameChar}{NameChar}
NameSeg3           {LeadNameChar}{NameChar}{NameChar}{NameChar}
NameSeg            {LeadNameChar}{{NameSeg1}}{{NameSeg2}}{{NameSeg3}}

NameString         {RootChar}{{RootChar}{NamePath}}[[^]+{NamePath}]{NonEmptyNamePath}
NamePath           {NonEmptyNamePath}?
NonEmptyNamePath  {NameSeg}{NamePathTail}*
NamePathTail      [.]{{NameSeg}}

%%
/* Rules */

[]                { count (0); }
[\n]              { count (0); } /* Handle files with both LF and CR/LF */
[\r]              { count (0); } /* termination on both Unix and Windows */
[ \t]             { count (0); }

"/*"              { if (!comment ()) yyterminate (); }
"//"              { if (!comment2 ()) yyterminate (); }

"\"              { if (literal ()) return (PARSEOP_STRING_LITERAL); else yyterminate (); }
";"              { count (0); return(';'); }

0[xX]{{HexDigitChar}}+ |
{{DigitChar}}+    { AslCompilerIval.i = UtDoConstant ((char *) AslCompilerItext); }

```

```

count (1); return (PARSEOP_INTEGER); }

"Include"      { count (1); return (PARSEOP_INCLUDE); }
"#include"    { count (1); return (PARSEOP_INCLUDE_CSTYLE); }
"#line"       { count (1); return (PARSEOP_LINE_CSTYLE); }
"External"    { count (1); return (PARSEOP_EXTERNAL); }

/*****
*
* Main ASL operators
*
*****/

"AccessAs"    { count (1); return (PARSEOP_ACCESSAS); }
"Acquire"     { count (3); return (PARSEOP_ACQUIRE); }
"Add"         { count (3); return (PARSEOP_ADD); }
"Alias"       { count (2); return (PARSEOP_ALIAS); }
"And"         { count (3); return (PARSEOP_AND); }
"BankField"   { count (2); return (PARSEOP_BANKFIELD); }
"Break"       { count (3); return (PARSEOP_BREAK); }
"BreakPoint"  { count (3); return (PARSEOP_BREAKPOINT); }
"Buffer"      { count (1); return (PARSEOP_BUFFER); }
"Case"        { count (3); return (PARSEOP_CASE); }
"Concatenate" { count (3); return (PARSEOP_CONCATENATE); }
"ConcatenateResTemplate" { count (3); return (PARSEOP_CONCATENATERESTEMPLATE); }
"CondRefOf"   { count (3); return (PARSEOP_CONDREFOF); }
"Connection"  { count (2); return (PARSEOP_CONNECTION); }
"Continue"    { count (3); return (PARSEOP_CONTINUE); }
"CopyObject"  { count (3); return (PARSEOP_COPYOBJECT); }
"CreateBitField" { count (2); return (PARSEOP_CREATEBITFIELD); }
"CreateByteField" { count (2); return (PARSEOP_CREATEBYTEFIELD); }
"CreateDWordField" { count (2); return (PARSEOP_CREATEDWORDFIELD); }
"CreateField" { count (2); return (PARSEOP_CREATEFIELD); }
"CreateQWordField" { count (2); return (PARSEOP_CREATEQWORDFIELD); }
"CreateWordField" { count (2); return (PARSEOP_CREATEWORDFIELD); }
"DataTableRegion" { count (2); return (PARSEOP_DATATABLEREGION); }
"Debug"       { count (1); return (PARSEOP_DEBUG); }
"Decrement"   { count (3); return (PARSEOP_DECREMENT); }
"Default"     { count (3); return (PARSEOP_DEFAULT); }
"DefinitionBlock" { count (1); return (PARSEOP_DEFINITIONBLOCK); }
"DeRefOf"     { count (3); return (PARSEOP_DEREFEOF); }
"Device"      { count (2); return (PARSEOP_DEVICE); }
"Divide"      { count (3); return (PARSEOP_DIVIDE); }
"Eisaid"      { count (1); return (PARSEOP_EISAID); }
"Else"        { count (3); return (PARSEOP_ELSE); }
"ElseIf"      { count (3); return (PARSEOP_ELSEIF); }
"Event"       { count (2); return (PARSEOP_EVENT); }
"Fatal"       { count (3); return (PARSEOP_FATAL); }

```



```

"Field"          { count (2); return (PARSEOP_FIELD); }
"FindSetLeftBit"  { count (3); return (PARSEOP_FINDSETLEFTBIT); }
"FindSetRightBit" { count (3); return (PARSEOP_FINDSETRIGHTBIT); }
"FromBcd"        { count (3); return (PARSEOP_FROMBCD); }
"Function"       { count (2); return (PARSEOP_FUNCTION); }
"If"             { count (3); return (PARSEOP_IF); }
"Increment"      { count (3); return (PARSEOP_INCREMENT); }
"Index"          { count (3); return (PARSEOP_INDEX); }
"IndexField"     { count (2); return (PARSEOP_INDEXFIELD); }
"LAnd"           { count (3); return (PARSEOP_LAND); }
"LEqual"         { count (3); return (PARSEOP_LEQUAL); }
"LGreater"       { count (3); return (PARSEOP_LGREATER); }
"LGreaterEqual" { count (3); return (PARSEOP_LGREATEREQUAL); }
"LLess"          { count (3); return (PARSEOP_LLESS); }
"LLessEqual"     { count (3); return (PARSEOP_LLESSEQUAL); }
"LNot"           { count (3); return (PARSEOP_LNOT); }
"LNotEqual"      { count (3); return (PARSEOP_LNOTEQUAL); }
"Load"           { count (3); return (PARSEOP_LOAD); }
"LoadTable"      { count (3); return (PARSEOP_LOADTABLE); }
"LOr"            { count (3); return (PARSEOP_LOR); }
"Match"          { count (3); return (PARSEOP_MATCH); }
"Method"         { count (2); return (PARSEOP_METHOD); }
"Mid"            { count (3); return (PARSEOP_MID); }
"Mod"            { count (3); return (PARSEOP_MOD); }
"Multiply"       { count (3); return (PARSEOP_MULTIPLY); }
"Mutex"          { count (2); return (PARSEOP_MUTEX); }
"Name"           { count (2); return (PARSEOP_NAME); }
"NAnd"           { count (3); return (PARSEOP_NAND); }
"Noop"           { count (3); return (PARSEOP_NOOP); }
"NOR"            { count (3); return (PARSEOP_NOR); }
"Not"            { count (3); return (PARSEOP_NOT); }
"Notify"         { count (3); return (PARSEOP_NOTIFY); }
"ObjectType"     { count (3); return (PARSEOP_OBJECTTYPE); }
"Offset"         { count (1); return (PARSEOP_OFFSET); }
"One"            { count (1); return (PARSEOP_ONE); }
"Ones"           { count (1); return (PARSEOP_ONES); }
"OperationRegion" { count (2); return (PARSEOP_OPERATIONREGION); }
"Or"             { count (3); return (PARSEOP_OR); }
"Package"        { count (1); return (PARSEOP_PACKAGE); }
"PowerResource"  { count (2); return (PARSEOP_POWERRESOURCE); }
"Processor"      { count (2); return (PARSEOP_PROCESSOR); }
"RefOf"          { count (3); return (PARSEOP_REFOF); }
"Release"        { count (3); return (PARSEOP_RELEASE); }
"Reset"          { count (3); return (PARSEOP_RESET); }
"Return"         { count (3); return (PARSEOP_RETURN); }
"Revision"       { count (1); return (PARSEOP_REVISION); }
"Scope"          { count (2); return (PARSEOP_SCOPE); }
"ShiftLeft"     { count (3); return (PARSEOP_SHIFTLEFT); }

```

```

"ShiftRight"    { count (3); return (PARSEOP_SHIFTRIGHT); }
"Signal"        { count (3); return (PARSEOP_SIGNAL); }
"SizeOf"        { count (3); return (PARSEOP_SIZEOF); }
"Sleep"         { count (3); return (PARSEOP_SLEEP); }
"Stall"         { count (3); return (PARSEOP_STALL); }
"Store"         { count (3); return (PARSEOP_STORE); }
"Subtract"      { count (3); return (PARSEOP_SUBTRACT); }
"Switch"        { count (3); return (PARSEOP_SWITCH); }
"ThermalZone"   { count (2); return (PARSEOP_THERMALZONE); }
"Timer"         { count (3); return (PARSEOP_TIMER); }
"ToBcd"         { count (3); return (PARSEOP_TOBCD); }
"ToBuffer"      { count (3); return (PARSEOP_TOBUFFER); }
"ToDecimalString" { count (3); return (PARSEOP_TODECIMALSTRING); }
"ToHexString"   { count (3); return (PARSEOP_TOHEXSTRING); }
"ToInteger"     { count (3); return (PARSEOP_TOINTEGER); }
"ToString"      { count (3); return (PARSEOP_TOSTRING); }
"ToUuid"        { count (1); return (PARSEOP_TOUUID); }
"Unicode"       { count (1); return (PARSEOP_UNICODE); }
"Unload"        { count (3); return (PARSEOP_UNLOAD); }
"Wait"          { count (3); return (PARSEOP_WAIT); }
"While"         { count (3); return (PARSEOP_WHILE); }
"XOr"           { count (3); return (PARSEOP_XOR); }
"Zero"          { count (1); return (PARSEOP_ZERO); }

```

/* Control method arguments and locals */

```

"Arg0"          { count (1); return (PARSEOP_ARG0); }
"Arg1"          { count (1); return (PARSEOP_ARG1); }
"Arg2"          { count (1); return (PARSEOP_ARG2); }
"Arg3"          { count (1); return (PARSEOP_ARG3); }
"Arg4"          { count (1); return (PARSEOP_ARG4); }
"Arg5"          { count (1); return (PARSEOP_ARG5); }
"Arg6"          { count (1); return (PARSEOP_ARG6); }
"Local0"        { count (1); return (PARSEOP_LOCAL0); }
"Local1"        { count (1); return (PARSEOP_LOCAL1); }
"Local2"        { count (1); return (PARSEOP_LOCAL2); }
"Local3"        { count (1); return (PARSEOP_LOCAL3); }
"Local4"        { count (1); return (PARSEOP_LOCAL4); }
"Local5"        { count (1); return (PARSEOP_LOCAL5); }
"Local6"        { count (1); return (PARSEOP_LOCAL6); }
"Local7"        { count (1); return (PARSEOP_LOCAL7); }

```

/**/

*

* Resource Descriptor macros

*

*****/

```

"ResourceTemplate"    { count (1); return (PARSEOP_RESOURCETEMPLATE); }
"RawDataBuffer"      { count (1); return (PARSEOP_DATABUFFER); }

"DMA"                { count (1); return (PARSEOP_DMA); }
"DWordIO"            { count (1); return (PARSEOP_DWORDIO); }
"DWordMemory"        { count (1); return (PARSEOP_DWORDMEMORY); }
"DWordSpace"         { count (1); return (PARSEOP_DWORDSPACE); }
"EndDependentFn"     { count (1); return (PARSEOP_ENDDEPENDENTFN); }
"ExtendedIO"         { count (1); return (PARSEOP_EXTENDEDIO); }
"ExtendedMemory"     { count (1); return (PARSEOP_EXTENDEDMEMORY); }
"ExtendedSpace"      { count (1); return (PARSEOP_EXTENDEDSPACE); }
"FixedDma"           { count (1); return (PARSEOP_FIXEDDMA); }
"FixedIO"            { count (1); return (PARSEOP_FIXEDIO); }
"GpioInt"            { count (1); return (PARSEOP_GPIO_INT); }
"GpioIo"             { count (1); return (PARSEOP_GPIO_IO); }
"I2cSerialBus"       { count (1); return (PARSEOP_I2C_SERIALBUS); }
"Interrupt"          { count (1); return (PARSEOP_INTERRUPT); }
"IO"                 { count (1); return (PARSEOP_IO); }
"IRQ"                { count (1); return (PARSEOP_IRQ); }
"IRQNoFlags"         { count (1); return (PARSEOP_IRQNOFLAGS); }
"Memory24"           { count (1); return (PARSEOP_MEMORY24); }
"Memory32"           { count (1); return (PARSEOP_MEMORY32); }
"Memory32Fixed"      { count (1); return (PARSEOP_MEMORY32FIXED); }
"QWordIO"            { count (1); return (PARSEOP_QWORDIO); }
"QWordMemory"        { count (1); return (PARSEOP_QWORDMEMORY); }
"QWordSpace"         { count (1); return (PARSEOP_QWORDSPACE); }
"Register"           { count (1); return (PARSEOP_REGISTER); }
"SpiSerialBus"       { count (1); return (PARSEOP_SPI_SERIALBUS); }
"StartDependentFn"   { count (1); return (PARSEOP_STARTDEPENDENTFN); }
"StartDependentFnNoPri" { count (1); return (PARSEOP_STARTDEPENDENTFN_NOPRI); }
"UartSerialBus"      { count (1); return (PARSEOP_UART_SERIALBUS); }
"VendorLong"         { count (1); return (PARSEOP_VENDORLONG); }
"VendorShort"        { count (1); return (PARSEOP_VENDORSHORT); }
"WordBusNumber"      { count (1); return (PARSEOP_WORDBUSNUMBER); }
"WordIO"             { count (1); return (PARSEOP_WORDIO); }
"WordSpace"          { count (1); return (PARSEOP_WORDSPACE); }

```

```

/*****

```

```

*
```

```

* Keywords used as arguments to ASL operators and macros

```

```

*
```

```

*****/

```

```

/* AccessAttribKeyword: Serial Bus Attributes (ACPI 5.0) */

```

```

"AttribQuick"        { count (0); return (PARSEOP_ACCESSATTRIB_QUICK); }

```

```

"AttribSendReceive"    { count (0); return (PARSEOP_ACCESSATTRIB_SND_RCV); }
"AttribByte"          { count (0); return (PARSEOP_ACCESSATTRIB_BYTE); }
"AttribWord"          { count (0); return (PARSEOP_ACCESSATTRIB_WORD); }
"AttribBlock"         { count (0); return (PARSEOP_ACCESSATTRIB_BLOCK); }
"AttribProcessCall"   { count (0); return (PARSEOP_ACCESSATTRIB_WORD_CALL); }
"AttribBlockProcessCall" { count (0); return (PARSEOP_ACCESSATTRIB_BLOCK_CALL); }

```

/ AccessAttribKeyword: Legacy synonyms for above (pre-ACPI 5.0) */*

```

"SMBQuick"            { count (0); return (PARSEOP_ACCESSATTRIB_QUICK); }
"SMBSendReceive"     { count (0); return (PARSEOP_ACCESSATTRIB_SND_RCV); }
"SMBByte"            { count (0); return (PARSEOP_ACCESSATTRIB_BYTE); }
"SMBWord"            { count (0); return (PARSEOP_ACCESSATTRIB_WORD); }
"SMBBlock"           { count (0); return (PARSEOP_ACCESSATTRIB_BLOCK); }
"SMBProcessCall"     { count (0); return (PARSEOP_ACCESSATTRIB_WORD_CALL); }
"SMBBlockProcessCall" { count (0); return (PARSEOP_ACCESSATTRIB_BLOCK_CALL); }

```

/ AccessTypeKeyword: Field Access Types */*

```

"AnyAcc"              { count (0); return (PARSEOP_ACCESSTYPE_ANY); }
"ByteAcc"             { count (0); return (PARSEOP_ACCESSTYPE_BYTE); }
"WordAcc"             { count (0); return (PARSEOP_ACCESSTYPE_WORD); }
"DWordAcc"            { count (0); return (PARSEOP_ACCESSTYPE_DWORD); }
"QWordAcc"            { count (0); return (PARSEOP_ACCESSTYPE_QWORD); }
"BufferAcc"           { count (0); return (PARSEOP_ACCESSTYPE_BUF); }

```

/ AddressingModeKeyword: Mode - Resource Descriptors (ACPI 5.0) */*

```

"AddressingMode7Bit"  { count (0); return (PARSEOP_ADDRESSINGMODE_7BIT); }
"AddressingMode10Bit" { count (0); return (PARSEOP_ADDRESSINGMODE_10BIT); }

```

/ AddressKeyword: ACPI memory range types */*

```

"AddressRangeMemory"  { count (0); return (PARSEOP_ADDRESSTYPE_MEMORY); }
"AddressRangeReserved" { count (0); return (PARSEOP_ADDRESSTYPE_RESERVED); }
"AddressRangeNVS"     { count (0); return (PARSEOP_ADDRESSTYPE_NVS); }
"AddressRangeACPI"    { count (0); return (PARSEOP_ADDRESSTYPE_ACPI); }

```

/ BusMasterKeyword: DMA Bus Mastering */*

```

"BusMaster"           { count (0); return (PARSEOP_BUSMASTERTYPE_MASTER); }
"NotBusMaster"        { count (0); return (PARSEOP_BUSMASTERTYPE_NOTMASTER); }

```

/ ByteLengthKeyword: Bits per Byte - Resource Descriptors (ACPI 5.0) */*

```

"DataBitsFive"        { count (0); return (PARSEOP_BITSPERBYTE_FIVE); }
"DataBitsSix"         { count (0); return (PARSEOP_BITSPERBYTE_SIX); }
"DataBitsSeven"       { count (0); return (PARSEOP_BITSPERBYTE_SEVEN); }

```

```

"DataBitsEight"      { count (0); return (PARSEOP_BITSPERBYTE_EIGHT); }
"DataBitsNine"      { count (0); return (PARSEOP_BITSPERBYTE_NINE); }

/* ClockPhaseKeyword: Resource Descriptors (ACPI 5.0) */

"ClockPhaseFirst"   { count (0); return (PARSEOP_CLOCKPHASE_FIRST); }
"ClockPhaseSecond" { count (0); return (PARSEOP_CLOCKPHASE_SECOND); }

/* ClockPolarityKeyword: Resource Descriptors (ACPI 5.0) */

"ClockPolarityLow"  { count (0); return (PARSEOP_CLOCKPOLARITY_LOW); }
"ClockPolarityHigh" { count (0); return (PARSEOP_CLOCKPOLARITY_HIGH); }

/* DecodeKeyword: Type of Memory Decoding - Resource Descriptors */

"PosDecode"         { count (0); return (PARSEOP_DECODETYPE_POS); }
"SubDecode"         { count (0); return (PARSEOP_DECODETYPE_SUB); }

/* DmaTypeKeyword: DMA Types - DMA Resource Descriptor */

"Compatibility"     { count (0); return (PARSEOP_DMATYPE_COMPATIBILITY); }
"TypeA"             { count (0); return (PARSEOP_DMATYPE_A); }
"TypeB"             { count (0); return (PARSEOP_DMATYPE_B); }
"TypeF"             { count (0); return (PARSEOP_DMATYPE_F); }

/* EndianKeyword: Endian type - Resource Descriptor (ACPI 5.0) */

"LittleEndian"      { count (0); return (PARSEOP_ENDIAN_LITTLE); }
"BigEndian"         { count (0); return (PARSEOP_ENDIAN_BIG); }

/* ExtendedAttribKeyword: Bus attributes, AccessAs operator (ACPI 5.0) */

"AttribBytes"       { count (0); return (PARSEOP_ACCESSATTRIB_MULTIBYTE); }
"AttribRawBytes"    { count (0); return (PARSEOP_ACCESSATTRIB_RAW_BYTES); }
"AttribRawProcessBytes" { count (0); return (PARSEOP_ACCESSATTRIB_RAW_PROCESS); }

/* FlowControlKeyword: Resource Descriptors (ACPI 5.0) */

"FlowControlHardware" { count (0); return (PARSEOP_FLOWCONTROL_HW); }
"FlowControlNone"    { count (0); return (PARSEOP_FLOWCONTROL_NONE); }
"FlowControlXon"     { count (0); return (PARSEOP_FLOWCONTROL_SW); }

/* InterruptLevelKeyword: Interrupt Active Types */

"ActiveBoth"        { count (0); return (PARSEOP_INTLEVEL_ACTIVEBOTH); }
"ActiveHigh"        { count (0); return (PARSEOP_INTLEVEL_ACTIVEHIGH); }
"ActiveLow"         { count (0); return (PARSEOP_INTLEVEL_ACTIVELOW); }

```

```

/* InterruptTypeKeyword: Interrupt Types */

"Edge"          { count (0); return (PARSEOP_INTTYPE_EDGE); }
"Level"         { count (0); return (PARSEOP_INTTYPE_LEVEL); }

/* IoDecodeKeyword: Type of Memory Decoding - Resource Descriptors */

"Decode10"      { count (0); return (PARSEOP_IODECODETYPE_10); }
"Decode16"      { count (0); return (PARSEOP_IODECODETYPE_16); }

/* IoRestrictionKeyword: I/O Restriction - GPIO Resource Descriptors (ACPI 5.0) */

"IoRestrictionNone"    { count (0); return (PARSEOP_IORESTRICT_NONE); }
"IoRestrictionInputOnly" { count (0); return (PARSEOP_IORESTRICT_IN); }
"IoRestrictionOutputOnly" { count (0); return (PARSEOP_IORESTRICT_OUT); }
"IoRestrictionNoneAndPreserve" { count (0); return (PARSEOP_IORESTRICT_PRESERVE); }

/* LockRuleKeyword: Global Lock use for Field Operator */

"Lock"          { count (0); return (PARSEOP_LOCKRULE_LOCK); }
"NoLock"        { count (0); return (PARSEOP_LOCKRULE_NOLOCK); }

/* MatchOpKeyword: Types for Match Operator */

"MTR"          { count (0); return (PARSEOP_MATCHTYPE_MTR); }
"MEQ"          { count (0); return (PARSEOP_MATCHTYPE_MEQ); }
"MLE"          { count (0); return (PARSEOP_MATCHTYPE_MLE); }
"MLT"          { count (0); return (PARSEOP_MATCHTYPE_MLT); }
"MGE"          { count (0); return (PARSEOP_MATCHTYPE_MGE); }
"MGT"          { count (0); return (PARSEOP_MATCHTYPE_MGT); }

/* MaxKeyword: Max Range Type - Resource Descriptors */

"MaxFixed"      { count (0); return (PARSEOP_MAXTYPE_FIXED); }
"MaxNotFixed"   { count (0); return (PARSEOP_MAXTYPE_NOTFIXED); }

/* MemTypeKeyword: Memory Types - Resource Descriptors */

"Cacheable"     { count (0); return (PARSEOP_MEMTYPE_CACHEABLE); }
"WriteCombining" { count (0); return (PARSEOP_MEMTYPE_WRITECOMBINING); }
"Prefetchable"  { count (0); return (PARSEOP_MEMTYPE_PREFETCHABLE); }
"NonCacheable"  { count (0); return (PARSEOP_MEMTYPE_NONCACHEABLE); }

/* MinKeyword: Min Range Type - Resource Descriptors */

"MinFixed"      { count (0); return (PARSEOP_MINTYPE_FIXED); }
"MinNotFixed"   { count (0); return (PARSEOP_MINTYPE_NOTFIXED); }

```

/ ObjectTypeKeyword: ACPI Object Types */*

```
"UnknownObj"      { count (0); return (PARSEOP_OBJECTTYPE_UNK); }
"IntObj"          { count (0); return (PARSEOP_OBJECTTYPE_INT); }
"StrObj"          { count (0); return (PARSEOP_OBJECTTYPE_STR); }
"BuffObj"         { count (0); return (PARSEOP_OBJECTTYPE_BUF); }
"PkgObj"          { count (0); return (PARSEOP_OBJECTTYPE_PKG); }
"FieldUnitObj"   { count (0); return (PARSEOP_OBJECTTYPE_FLD); }
"DeviceObj"       { count (0); return (PARSEOP_OBJECTTYPE_DEV); }
"EventObj"        { count (0); return (PARSEOP_OBJECTTYPE_EVT); }
"MethodObj"       { count (0); return (PARSEOP_OBJECTTYPE_MTH); }
"MutexObj"        { count (0); return (PARSEOP_OBJECTTYPE_MTX); }
"OpRegionObj"    { count (0); return (PARSEOP_OBJECTTYPE_OPR); }
"PowerResObj"     { count (0); return (PARSEOP_OBJECTTYPE_POW); }
"ProcessorObj"   { count (0); return (PARSEOP_OBJECTTYPE_PRO); }
"ThermalZoneObj" { count (0); return (PARSEOP_OBJECTTYPE_THZ); }
"BuffFieldObj"   { count (0); return (PARSEOP_OBJECTTYPE_BFF); }
"DDBHandleObj"   { count (0); return (PARSEOP_OBJECTTYPE_DDB); }
```

/ ParityKeyword: Resource Descriptors (ACPI 5.0) */*

```
"ParityTypeSpace" { count (0); return (PARSEOP_PARITYTYPE_SPACE); }
"ParityTypeMark"  { count (0); return (PARSEOP_PARITYTYPE_MARK); }
"ParityTypeOdd"   { count (0); return (PARSEOP_PARITYTYPE_ODD); }
"ParityTypeEven"  { count (0); return (PARSEOP_PARITYTYPE_EVEN); }
"ParityTypeNone"  { count (0); return (PARSEOP_PARITYTYPE_NONE); }
```

/ PinConfigKeyword: Pin Configuration - GPIO Resource Descriptors (ACPI 5.0) */*

```
"PullDefault"     { count (0); return (PARSEOP_PIN_PULLDEFAULT); }
"PullUp"          { count (0); return (PARSEOP_PIN_PULLUP); }
"PullDown"        { count (0); return (PARSEOP_PIN_PULLDOWN); }
"PullNone"        { count (0); return (PARSEOP_PIN_NOPULL); }
```

/ PolarityKeyword: Resource Descriptors (ACPI 5.0) */*

```
"PolarityLow"     { count (0); return (PARSEOP_DEVICEPOLARITY_LOW); }
"PolarityHigh"    { count (0); return (PARSEOP_DEVICEPOLARITY_HIGH); }
```

/ RangeTypeKeyword: I/O Range Types - Resource Descriptors */*

```
"ISAOnlyRanges"   { count (0); return (PARSEOP_RANGETYPE_ISAONLY); }
"NonISAOnlyRanges" { count (0); return (PARSEOP_RANGETYPE_NONISAONLY); }
"EntireRange"     { count (0); return (PARSEOP_RANGETYPE_ENTIRE); }
```

/ ReadWriteKeyword: Memory Access Types - Resource Descriptors */*

```
"ReadWrite"       { count (0); return (PARSEOP_READWRITETYPE_BOTH); }
```

```

"ReadOnly"          { count (0); return (PARSEOP_READWRITETYPE_READONLY); }

/* RegionSpaceKeyword: Operation Region Address Space Types */

"SystemIO"         { count (0); return (PARSEOP_REGIONSPACE_IO); }
"SystemMemory"     { count (0); return (PARSEOP_REGIONSPACE_MEM); }
"PCI_Config"       { count (0); return (PARSEOP_REGIONSPACE_PCI); }
"EmbeddedControl"  { count (0); return (PARSEOP_REGIONSPACE_EC); }
"SMBus"            { count (0); return (PARSEOP_REGIONSPACE_SMBUS); }
"SystemCMOS"       { count (0); return (PARSEOP_REGIONSPACE_CMOS); }
"PciBarTarget"     { count (0); return (PARSEOP_REGIONSPACE_PCIBAR); }
"IPMI"             { count (0); return (PARSEOP_REGIONSPACE_IPMI); }
"GeneralPurposeIo" { count (0); return (PARSEOP_REGIONSPACE_GPIO); } /* ACPI 5.0 */
"GenericSerialBus" { count (0); return (PARSEOP_REGIONSPACE_GSBUS); } /* ACPI 5.0 */
"FFixedHW"         { count (0); return (PARSEOP_REGIONSPACE_FFIXEDHW); }

/* ResourceTypeKeyword: Resource Usage - Resource Descriptors */

"ResourceConsumer" { count (0); return (PARSEOP_RESOURCECETYPE_CONSUMER); }
"ResourceProducer" { count (0); return (PARSEOP_RESOURCECETYPE_PRODUCER); }

/* SerializeRuleKeyword: Control Method Serialization */

"Serialized"       { count (0); return (PARSEOP_SERIALIZERULE_SERIAL); }
"NotSerialized"    { count (0); return (PARSEOP_SERIALIZERULE_NOTSERIAL); }

/* ShareTypeKeyword: Interrupt Sharing - Resource Descriptors */

"Shared"           { count (0); return (PARSEOP_SHARETYPE_SHARED); }
"Exclusive"        { count (0); return (PARSEOP_SHARETYPE_EXCLUSIVE); }
"SharedAndWake"    { count (0); return (PARSEOP_SHARETYPE_SHAREDWAKE); } /* ACPI 5.0 */
"ExclusiveAndWake" { count (0); return (PARSEOP_SHARETYPE_EXCLUSIVEWAKE); } /* ACPI 5.0
*/

/* SlaveModeKeyword: Resource Descriptors (ACPI 5.0) */

"ControllerInitiated" { count (0); return (PARSEOP_SLAVEMODE_CONTROLLERINIT); }
"DeviceInitiated"    { count (0); return (PARSEOP_SLAVEMODE_DEVICEINIT); }

/* StopBitsKeyword: Resource Descriptors (ACPI 5.0) */

"StopBitsOne"      { count (0); return (PARSEOP_STOPBITS_ONE); }
"StopBitsOnePlusHalf" { count (0); return (PARSEOP_STOPBITS_ONEPLUSHALF); }
"StopBitsTwo"      { count (0); return (PARSEOP_STOPBITS_TWO); }
"StopBitsZero"     { count (0); return (PARSEOP_STOPBITS_ZERO); }

/* TransferWidthKeyword: DMA Widths - Fixed DMA Resource Descriptor (ACPI 5.0) */

```



```

"Width8bit"          { count (0); return (PARSEOP_XFERSIZE_8); }
"Width16bit"         { count (0); return (PARSEOP_XFERSIZE_16); }
"Width32bit"         { count (0); return (PARSEOP_XFERSIZE_32); }
"Width64bit"         { count (0); return (PARSEOP_XFERSIZE_64); }
"Width128bit"        { count (0); return (PARSEOP_XFERSIZE_128); }
"Width256bit"        { count (0); return (PARSEOP_XFERSIZE_256); }

/* TranslationKeyword: Translation Density Types - Resource Descriptors */

"SparseTranslation"  { count (0); return (PARSEOP_TRANSLATIONTYPE_SPARSE); }
"DenseTranslation"   { count (0); return (PARSEOP_TRANSLATIONTYPE_DENSE); }

/* TypeKeyword: Translation Types - Resource Descriptors */

"TypeTranslation"    { count (0); return (PARSEOP_TYPE_TRANSLATION); }
"TypeStatic"         { count (0); return (PARSEOP_TYPE_STATIC); }

/* UpdateRuleKeyword: Field Update Rules */

"Preserve"           { count (0); return (PARSEOP_UPDATERULE_PRESERVE); }
"WriteAsOnes"        { count (0); return (PARSEOP_UPDATERULE_ONES); }
"WriteAsZeros"       { count (0); return (PARSEOP_UPDATERULE_ZEROS); }

/* WireModeKeyword: SPI Wire Mode - Resource Descriptors (ACPI 5.0) */

"FourWireMode"       { count (0); return (PARSEOP_WIREMODE_FOUR); }
"ThreeWireMode"      { count (0); return (PARSEOP_WIREMODE_THREE); }

/* XferTypeKeyword: DMA Transfer Types */

"Transfer8"           { count (0); return (PARSEOP_XFERTYPE_8); }
"Transfer8_16"        { count (0); return (PARSEOP_XFERTYPE_8_16); }
"Transfer16"          { count (0); return (PARSEOP_XFERTYPE_16); }

/* Predefined compiler names */

"__DATE__"           { count (0); return (PARSEOP__DATE__); }
"__FILE__"           { count (0); return (PARSEOP__FILE__); }
"__LINE__"           { count (0); return (PARSEOP__LINE__); }
"__PATH__"           { count (0); return (PARSEOP__PATH__); }

"{"                  { count (0); return('{'); }
"}"                  { count (0); return('}'); }
","                  { count (0); return(','); }
"("                  { count (0); return('('); }
")"                  { count (0); return(')'); }

```

```

{NameSeg}          { char *s;
                   count (0);
                   s=malloc (ACPI_NAME_SIZE + 1);
                   if (strcmp (AslCompilerText, "\\")
                       {
                           strcpy (s, "___");
                           AcpiUtStrupr (AslCompilerText);
                       }
                   memcpy (s, AslCompilerText, strlen (AslCompilerText));
                   AslCompilerLval.s = s;
                   DbgPrint (ASL_PARSE_OUTPUT, "NameSeg: %s\n", s);
                   return (PARSEOP_NAMESEG); }

{NameString}       { char *s;
                   count (0);
                   s=malloc (strlen (AslCompilerText)+1);
                   AcpiUtStrupr (AslCompilerText);
                   strcpy (s, AslCompilerText);
                   s[strlen (AslCompilerText)] = 0;
                   AslCompilerLval.s = s;
                   DbgPrint (ASL_PARSE_OUTPUT, "NameString: %s\n", s);
                   return (PARSEOP_NAMESTRING); }

"*" |
"/"          { count (1);
              AslCompilerError ("Parse error, expecting ASL keyword or name");}

.           { count (1);
              sprintf (MsgBuffer,
                      "Invalid character (0x%2.2X), expecting ASL keyword or name",
                      *AslCompilerText);
              AslCompilerError (MsgBuffer);}

<<EOF>>     { if (AslPopInputFileStack ())
              yyterminate();
              else
              return (PARSEOP_INCLUDE_END);};

%%

/*! [End] no source code translation !*/

typedef struct asl_file_node
{
    FILE          *File;
    UINT32        CurrentLineNumber;
    YY_BUFFER_STATE  State;
    char          *Filename;
}

```

```

    struct asl_file_node  *Next;

} ASL_FILE_NODE;

ASL_FILE_NODE      *InputStack = NULL;

/*****
*
* FUNCTION:  AslPopInputFileStack
*
* PARAMETERS:  None
*
* RETURN:    0 if a node was popped, -1 otherwise
*
* DESCRIPTION: Pop the top of the input file stack and point the parser to
*              the saved parse buffer contained in the fnode.  Also, set the
*              global line counters to the saved values.  This function is
*              called when an include file reaches EOF.
*
*****/

int
AslPopInputFileStack (
    void)
{
    ASL_FILE_NODE      *Fnode;

    Fnode = InputStack;
    DbgPrint (ASL_PARSE_OUTPUT, "\nPop InputFile Stack, Fnode %p\n", Fnode);

    if (!Fnode)
    {
        return -1;
    }

    /* Close the current include file */

    fclose (yyin);

    /* Update the top-of-stack */

    InputStack = Fnode->Next;

    /* Reset global line counter and filename */

```

```

Gbl_Files[ASL_FILE_INPUT].Filename = Fnode->Filename;
Gbl_CurrentLineNumber = Fnode->CurrentLineNumber;

/* Point the parser to the popped file */

yy_delete_buffer (YY_CURRENT_BUFFER);
yy_switch_to_buffer (Fnode->State);

/* All done with this node */

ACPI_FREE (Fnode);
return 0;
}

/*****
*
* FUNCTION:  AslPushInputFileStack
*
* PARAMETERS:  InputFile      - Open file pointer
*              Filename       - Name of the file
*
* RETURN:     None
*
* DESCRIPTION: Push the InputFile onto the file stack, and point the parser
*              to this file.  Called when an include file is successfully
*              opened.
*****/

void
AslPushInputFileStack (
    FILE      *InputFile,
    char      *Filename)
{
    ASL_FILE_NODE    *Fnode;
    YY_BUFFER_STATE  State;

    /* Save the current state in an Fnode */

    Fnode = UtLocalCalloc (sizeof (ASL_FILE_NODE));

    Fnode->File      = yyin;
    Fnode->Next      = InputStack;
    Fnode->State     = YY_CURRENT_BUFFER;
    Fnode->CurrentLineNumber = Gbl_CurrentLineNumber;
    Fnode->Filename  = Gbl_Files[ASL_FILE_INPUT].Filename;

```

```

/* Push it on the stack */

InputStack = Fnode;

/* Point the parser to this file */

State = yy_create_buffer (InputFile, YY_BUF_SIZE);
yy_switch_to_buffer (State);

DbgPrint (ASL_PARSE_OUTPUT, "\nPush InputFile Stack, returning %p\n\n", InputFile);

/* Reset the global line count and filename */

Gbl_Files[ASL_FILE_INPUT].Filename = Filename;
Gbl_CurrentLineNumber = 1;
yyin = InputFile;
}

/*****
*
* FUNCTION:  ResetCurrentLineBuffer
*
* PARAMETERS:  None
*
* RETURN:    None
*
* DESCRIPTION:  Reset the Line Buffer to zero, increment global line numbers.
*
*****/

void
ResetCurrentLineBuffer (
    void)
{

    if (Gbl_Files[ASL_FILE_SOURCE_OUTPUT].Handle)
    {
        FIWriteFile (ASL_FILE_SOURCE_OUTPUT, Gbl_CurrentLineBuffer,
            Gbl_LineBufPtr - Gbl_CurrentLineBuffer);
    }

    Gbl_CurrentLineOffset += Gbl_CurrentColumn;
    Gbl_CurrentColumn = 0;

    Gbl_CurrentLineNumber++;
    Gbl_LogicalLineNumber++;

```

```

    Gbl_LineBufPtr = Gbl_CurrentLineBuffer;
}

/*****
*
* FUNCTION:  InsertLineBuffer
*
* PARAMETERS:  SourceChar  - One char from the input ASL source file
*
* RETURN:     None
*
* DESCRIPTION: Put one character of the source file into the temp line buffer
*
*****/

#define ASL_SPACES_PER_TAB 4

void
InsertLineBuffer (
    int          SourceChar)
{
    UINT32      i;
    UINT32      Count = 1;

    if (SourceChar == EOF)
    {
        return;
    }

    Gbl_InputByteCount++;

    /* Handle tabs.  Convert to spaces */

    if (SourceChar == '\t')
    {
        SourceChar = ' ';
        Count = ASL_SPACES_PER_TAB -
            (Gbl_CurrentColumn & (ASL_SPACES_PER_TAB-1));
    }

    for (i = 0; i < Count; i++)
    {
        Gbl_CurrentColumn++;

        /* Insert the character into the line buffer */

```

```

    *Gbl_LineBufPtr = (UINT8) SourceChar;
    Gbl_LineBufPtr++;

    if (Gbl_LineBufPtr > (Gbl_CurrentLineBuffer + (ASL_LINE_BUFFER_SIZE - 1)))
    {
#ifdef 0
        /*
         * Warning if we have split a long source line.
         * <Probably overkill>
         */
        sprintf (MsgBuffer, "Max %u", ASL_LINE_BUFFER_SIZE);
        AslCommonError (ASL_WARNING, ASL_MSG_LONG_LINE,
            Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
            Gbl_CurrentLineOffset, Gbl_CurrentColumn,
            Gbl_Files[ASL_FILE_INPUT].Filename, MsgBuffer);
#endif

        ResetCurrentLineBuffer ();
    }
    else if (SourceChar == '\n')
    {
        /* End of line */

        ResetCurrentLineBuffer ();
    }
}

/*****
*
* FUNCTION:  count
*
* PARAMETERS:  yytext    - Contains the matched keyword.
*              Type      - Keyword/Character type:
*              0 = anything except a keyword
*              1 = pseudo-keywords
*              2 = non-executable ASL keywords
*              3 = executable ASL keywords
*
* RETURN:     None
*
* DESCRIPTION: Count keywords and put them into the line buffer
*
*****/

void

```

```

count (
    int      Type)
{
    int      i;

    switch (Type)
    {
    case 2:
        TotalKeywords++;
        TotalNamedObjects++;
        break;

    case 3:
        TotalKeywords++;
        TotalExecutableOpcodes++;
        break;
    }

    for (i = 0; (yytext[i] != 0) && (yytext[i] != EOF); i++)
    {
        InsertLineBuffer (yytext[i]);
        *Gbl_LineBufPtr = 0;
    }
}

/*****
*
* FUNCTION:  comment
*
* PARAMETERS:  none
*
* RETURN:    none
*
* DESCRIPTION:  Process a standard comment.
*
*****/

char
comment (void)
{
    char      c;
    char      c1 = 0;

    InsertLineBuffer ('/');
    InsertLineBuffer (*');

```


loop:

```
/* Eat chars until end-of-comment */

while ((c = (char) input()) != '*' && c != EOF)
{
    InsertLineBuffer (c);
    c1 = c;
}

if (c == EOF)
{
    goto EarlyEOF;
}

/*
 * Check for nested comment -- can help catch cases where a previous
 * comment was accidentally left unterminated
 */
if ((c1 == '/') && (c == '*'))
{
    AslCommonError (ASL_WARNING, ASL_MSG_NESTED_COMMENT,
                    Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                    Gbl_InputByteCount, Gbl_CurrentColumn,
                    Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
}

/* Comment is closed only if the NEXT character is a slash */

InsertLineBuffer (c);

if ((c1 = (char) input()) != '/' && c1 != EOF)
{
    unput(c1);
    goto loop;
}

if (c1 == EOF)
{
    goto EarlyEOF;
}

InsertLineBuffer (c1);
return TRUE;
```

EarlyEOF:

```

/*
 * Premature End-Of-File
 */
AslCommonError (ASL_ERROR, ASL_MSG_EARLY_EOF,
                Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
return (FALSE);
}

/*****
 *
 * FUNCTION:  comment
 *
 * PARAMETERS:  none
 *
 * RETURN:    none
 *
 * DESCRIPTION: Process a new "/*" comment.
 *
 *****/

char
comment2 (void)
{
    char    c;

    InsertLineBuffer ('/');
    InsertLineBuffer ('/');

    while ((c = (char) input()) != '\n' && c != EOF)
    {
        InsertLineBuffer (c);
    }

    if (c == EOF)
    {
        /* End of file is OK, change to newline. Let parser detect EOF later */

        c = '\n';
    }

    InsertLineBuffer (c);
    return (TRUE);
}

```

```

/*****
*
* FUNCTION:  literal
*
* PARAMETERS:  none
*
* RETURN:    none
*
* DESCRIPTION: Process a string literal (surrounded by quotes)
*
*****/

```

```

#define ASL_NORMAL_CHAR    0
#define ASL_ESCAPE_SEQUENCE  1
#define ASL_OCTAL_CONSTANT  2
#define ASL_HEX_CONSTANT    3

```

```

char
literal (void)
{
    char    *StringBuffer = MsgBuffer;
    char    *EndBuffer = MsgBuffer + ASL_MSG_BUFFER_SIZE;
    char    *CleanString;
    char    StringChar;
    UINT32   State = ASL_NORMAL_CHAR;
    UINT32   i = 0;
    UINT8    Digit;
    char    ConvertBuffer[4];

```

```

/*
* Eat chars until end-of-literal.
* NOTE: Put back the original surrounding quotes into the
* source line buffer.
*/

```

```

InsertLineBuffer ("\");
while ((StringChar = (char) input()) != EOF)
{
    InsertLineBuffer (StringChar);

```

DoCharacter:

```

switch (State)
{
case ASL_NORMAL_CHAR:

    switch (StringChar)

```

```

{
case '\\':
    /*
     * Special handling for backslash-escape sequence. We will
     * toss the backslash and translate the escape char(s).
     */
    State = ASL_ESCAPE_SEQUENCE;
    continue;

case '\":
    /* String terminator */

    goto CompletedString;
}
break;

case ASL_ESCAPE_SEQUENCE:

    State = ASL_NORMAL_CHAR;
    switch (StringChar)
    {
case 'a':
    StringChar = 0x07;    /* BELL */
    break;

case 'b':
    StringChar = 0x08;    /* BACKSPACE */
    break;

case 'f':
    StringChar = 0x0C;    /* FORMFEED */
    break;

case 'n':
    StringChar = 0x0A;    /* LINEFEED */
    break;

case 'r':
    StringChar = 0x0D;    /* CARRIAGE RETURN*/
    break;

case 't':
    StringChar = 0x09;    /* HORIZONTAL TAB */
    break;

case 'v':

```

```

StringChar = 0x0B;    /* VERTICAL TAB */
break;

case 'x':
    State = ASL_HEX_CONSTANT;
    i = 0;
    continue;

case '\':           /* Single Quote */
case '\"':         /* Double Quote */
case '\\':         /* Backslash */
    break;

default:

    /* Check for an octal digit (0-7) */

    if (ACPI_IS_OCTAL_DIGIT (StringChar))
    {
        State = ASL_OCTAL_CONSTANT;
        ConvertBuffer[0] = StringChar;
        i = 1;
        continue;
    }

    /* Unknown escape sequence issue warning, but use the character */

    AslCommonError (ASL_WARNING, ASL_MSG_INVALID_ESCAPE,
                    Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                    Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                    Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
break;
    }
break;

case ASL_OCTAL_CONSTANT:

    /* Up to three octal digits allowed */

    if (!ACPI_IS_OCTAL_DIGIT (StringChar) ||
        (i > 2))
    {
        /*
         * Reached end of the constant. Convert the assembled ASCII
         * string and resume processing of the next character
         */
        ConvertBuffer[i] = 0;

```

```

Digit = (UINT8) ACPI_STRTOUL (ConvertBuffer, NULL, 8);

/* Check for NULL or non-ascii character (ignore if so) */

if ((Digit == 0) || (Digit > ACPI_ASCII_MAX))
{
    AslCommonError (ASL_WARNING, ASL_MSG_INVALID_STRING,
                    Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                    Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                    Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
}
else
{
    *StringBuffer = (char) Digit;
    StringBuffer++;
    if (StringBuffer >= EndBuffer)
    {
        goto BufferOverflow;
    }
}

State = ASL_NORMAL_CHAR;
goto DoCharacter;
break;
}

/* Append another digit of the constant */

ConvertBuffer[i] = StringChar;
i++;
continue;

case ASL_HEX_CONSTANT:

/* Up to two hex digits allowed */

if (!ACPI_IS_XDIGIT (StringChar) ||
    (i > 1))
{
    /*
     * Reached end of the constant. Convert the assembled ASCII
     * string and resume processing of the next character
     */
    ConvertBuffer[i] = 0;
    Digit = (UINT8) ACPI_STRTOUL (ConvertBuffer, NULL, 16);

    /* Check for NULL or non-ascii character (ignore if so) */

```

```

if ((Digit == 0) || (Digit > ACPI_ASCII_MAX))
{
    AslCommonError (ASL_WARNING, ASL_MSG_INVALID_STRING,
                    Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                    Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                    Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
}
else
{
    *StringBuffer = (char) Digit;
    StringBuffer++;
    if (StringBuffer >= EndBuffer)
    {
        goto BufferOverflow;
    }
}

State = ASL_NORMAL_CHAR;
goto DoCharacter;
break;
}

/* Append another digit of the constant */

ConvertBuffer[i] = StringChar;
i++;
continue;
}

/* Save the finished character */

*StringBuffer = StringChar;
StringBuffer++;
if (StringBuffer >= EndBuffer)
{
    goto BufferOverflow;
}
}

/*
 * Premature End-Of-File
 */
AslCommonError (ASL_ERROR, ASL_MSG_EARLY_EOF,
                Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
return (FALSE);

```

CompletedString:

```
/*
 * Null terminate the input string and copy string to a new buffer
 */
*StringBuffer = 0;

CleanString = UtGetStringBuffer (strlen (MsgBuffer) + 1);
if (!CleanString)
{
    AslCommonError (ASL_ERROR, ASL_MSG_MEMORY_ALLOCATION,
                    Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                    Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                    Gbl_Files[ASL_FILE_INPUT].Filename, NULL);
    return (FALSE);
}

ACPI_STRCPY (CleanString, MsgBuffer);
AslCompilerIval.s = CleanString;
return (TRUE);
```

BufferOverflow:

```
/* Literal was too long */

AslCommonError (ASL_ERROR, ASL_MSG_STRING_LENGTH,
                Gbl_CurrentLineNumber, Gbl_LogicalLineNumber,
                Gbl_CurrentLineOffset, Gbl_CurrentColumn,
                Gbl_Files[ASL_FILE_INPUT].Filename, "Max length 4096");
return (FALSE);
}
```

Found in path(s):

```
* /opt/cola/permits/1589105629_1678440807.0264597/0/acpica-unix-20120111-tar-gz/acpica-unix-20120111/compiler/aslcompiler.l
```

1.8 liburcu 0.8.6

1.8.1 Available under license :

Mathieu Desnoyers
May 13th, 2009

IBM Corporation allowed LGPLv2.1+ licensing of their contribution to the userspace RCU library in a patch submitted on May 8, 2009 from Paul E. McKenney and reviewed by Steven L. Bennett:

<http://lists.casi.polymtl.ca/pipermail/ltt-dev/2009-May/001584.html>

I (Mathieu Desnoyers) re-implemented ACCESS_ONCE(), likely(), unlikely() and barrier() from scratch without reference to the original code.

commit id : 2dc5fa0f7cfbfb0a64a7a67b39626650e863f16a

Bert Wesarg <bert.wesarg@googlemail.com> approved LGPL relicensing of his patch in an email dated May 13, 2009 :

<http://lkml.org/lkml/2009/5/13/16>

xchg() primitives has been rewritten from a MIT-licensed cmpxchg for Intel and powerpc. They are MIT-licensed and therefore usable in LGPL code. This cmpxchg code was obtained from the atomic_ops project:

http://www.hpl.hp.com/research/linux/atomic_ops/

I (Mathieu Desnoyers) wrote the remainder of the code.

The license for the library files in this project was therefore changed to LGPLv2.1 on May 13, 2009, as detailed in LICENSE.

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Version 2.1, February 1999

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- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
- c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.
- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not

compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the

Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

- a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.
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1.11 glibc 2.23

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We call this license the `Lesser` General Public License because it does *Less* to protect the user's freedom than the ordinary General Public License. It also provides other free software developers *Less* of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is *Less* protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run

that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a ``work based on the library" and a ``work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

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``Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

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You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

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If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those

sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable ``work that uses the Library'', as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

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Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

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Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

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Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

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1.13 zlib 1.2.8

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1.14 ncurses 6.1

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-- vile: txtmode file-encoding=utf-8

1.15 libatomic 1.2.0

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1.16 open-ldap 2.4.33

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1.17 nfs-utils 1.1.0

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1.18 sg3-utils 1.35

1.18.1 Available under license :

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10th April 2012

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1.19 rsync 3.1.2

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1.20 vpp-papi 1.6.2

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```
* /opt/cola/permits/1155495057_1623189164.64/0/vpp-papi-1-6-tar-gz/vpp_papi-1.6/vpp_papi/vpp_papi.py  
* /opt/cola/permits/1155495057_1623189164.64/0/vpp-papi-1-6-tar-gz/vpp_papi-1.6/vpp_papi/vpp_serializer.py  
* /opt/cola/permits/1155495057_1623189164.64/0/vpp-papi-1-6-tar-gz/vpp_papi-1.6/setup.py
```

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Metadata-Version: 1.0

Name: vpp_papi

Version: 1.6

Summary: VPP Python binding

Home-page: https://wiki.fd.io/view/VPP/Python_API

Author: Ole Troan

Author-email: ot@cisco.com

License: Apache-2.0

Description: VPP Python language binding.

Platform: UNKNOWN

Found in path(s):

```
* /opt/cola/permits/1155495057_1623189164.64/0/vpp-papi-1-6-tar-gz/vpp_papi-1.6/PKG-INFO
```

No license file was found, but licenses were detected in source scan.

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Author: Ole Troan

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License: Apache-2.0

Description: VPP Python language binding.

Platform: UNKNOWN

Found in path(s):

```
* /opt/cola/permits/1155495057_1623189164.64/0/vpp-papi-1-6-tar-gz/vpp_papi-1.6/vpp_papi.egg-info/PKG-INFO
```

1.21 libvmtools 10.1.5.6677369

1.21.1 Available under license :

LICENSE

open-vm-tools v10.1.15

The Linux kernel modules are released under the GPL v2, a majority of the user level components are released under the LGPL v2.1, and the SVGA and mouse drivers are released under the X11 license.

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```
>>> cvtutf-1.4
>>> freebsd-1.72
>>> freebsd-base64-4.8
>>> unicode-5.0
```

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>>> freelsd-base64-4.8

base64.c -- routines to encode/decode base64 data

\$OpenLDAP: pkg/ldap/libraries/liblutil/base64.c,v 1.15 2006/01/03 22:12:11 kurt Exp \$ /

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>>> unicode-5.0

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1.22 pigz 2.4

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1. Seti UI - A subtle dark colored UI theme for Atom. (<https://github.com/jesseweed/seti-ui>)

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1.26 openssh 7.6-p1

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*
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*
* @author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>
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Julian Seward, Cambridge, UK.

jseward@acm.org

bzip2/libbzip2 version 1.0.2 of 30 December 2001

/*

minibz2

libbz2.dll test program.

by Yoshioka Tsuneo (tsuneo@rr.iij4u.or.jp)

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usage: minibz2 [-d] [-{1,2,..9}] [[srcfilename] destfilename]

*/

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1.28 python-pip 20.1.1

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2.5	2.4	2006	PSF	yes
2.5.1	2.5	2007	PSF	yes
2.5.2	2.5.1	2008	PSF	yes
2.5.3	2.5.2	2008	PSF	yes
2.6	2.5	2008	PSF	yes
2.6.1	2.6	2008	PSF	yes
2.6.2	2.6.1	2009	PSF	yes
2.6.3	2.6.2	2009	PSF	yes
2.6.4	2.6.3	2009	PSF	yes
2.6.5	2.6.4	2010	PSF	yes
3.0	2.6	2008	PSF	yes
3.0.1	3.0	2009	PSF	yes
3.1	3.0.1	2009	PSF	yes
3.1.1	3.1	2009	PSF	yes
3.1.2	3.1.1	2010	PSF	yes
3.1.3	3.1.2	2010	PSF	yes
3.1.4	3.1.3	2011	PSF	yes
3.2	3.1	2011	PSF	yes
3.2.1	3.2	2011	PSF	yes
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1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes
2.2.1	2.2	2002	PSF	yes
2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2003	PSF	yes
2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2002-2003	PSF	yes
2.3.3	2.3.2	2002-2003	PSF	yes
2.3.4	2.3.3	2004	PSF	yes
2.3.5	2.3.4	2005	PSF	yes
2.4	2.3	2004	PSF	yes
2.4.1	2.4	2005	PSF	yes
2.4.2	2.4.1	2005	PSF	yes
2.4.3	2.4.2	2006	PSF	yes
2.4.4	2.4.3	2006	PSF	yes

2.5	2.4	2006	PSF	yes
2.5.1	2.5	2007	PSF	yes
2.5.2	2.5.1	2008	PSF	yes
2.5.3	2.5.2	2008	PSF	yes
2.6	2.5	2008	PSF	yes
2.6.1	2.6	2008	PSF	yes
2.6.2	2.6.1	2009	PSF	yes
2.6.3	2.6.2	2009	PSF	yes
2.6.4	2.6.3	2009	PSF	yes
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A. HISTORY OF THE SOFTWARE

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

Release	Derived from	Year	Owner	GPL-compatible? (1)
0.9.0 thru 1.2		1991-1995	CWI	yes
1.3 thru 1.5.2	1.2	1995-1999	CNRI	yes
1.6	1.5.2	2000	CNRI	no
2.0	1.6	2000	BeOpen.com	no
1.6.1	1.6	2001	CNRI	yes (2)
2.1	2.0+1.6.1	2001	PSF	no
2.0.1	2.0+1.6.1	2001	PSF	yes
2.1.1	2.1+2.0.1	2001	PSF	yes
2.2	2.1.1	2001	PSF	yes
2.1.2	2.1.1	2002	PSF	yes
2.1.3	2.1.2	2002	PSF	yes
2.2.1	2.2	2002	PSF	yes

2.2.2	2.2.1	2002	PSF	yes
2.2.3	2.2.2	2003	PSF	yes
2.3	2.2.2	2002-2003	PSF	yes
2.3.1	2.3	2002-2003	PSF	yes
2.3.2	2.3.1	2002-2003	PSF	yes
2.3.3	2.3.2	2002-2003	PSF	yes
2.3.4	2.3.3	2004	PSF	yes
2.3.5	2.3.4	2005	PSF	yes
2.4	2.3	2004	PSF	yes
2.4.1	2.4	2005	PSF	yes
2.4.2	2.4.1	2005	PSF	yes
2.4.3	2.4.2	2006	PSF	yes
2.4.4	2.4.3	2006	PSF	yes
2.5	2.4	2006	PSF	yes
2.5.1	2.5	2007	PSF	yes
2.5.2	2.5.1	2008	PSF	yes
2.5.3	2.5.2	2008	PSF	yes
2.6	2.5	2008	PSF	yes
2.6.1	2.6	2008	PSF	yes
2.6.2	2.6.1	2009	PSF	yes
2.6.3	2.6.2	2009	PSF	yes
2.6.4	2.6.3	2009	PSF	yes
2.6.5	2.6.4	2010	PSF	yes
3.0	2.6	2008	PSF	yes
3.0.1	3.0	2009	PSF	yes
3.1	3.0.1	2009	PSF	yes
3.1.1	3.1	2009	PSF	yes
3.1.2	3.1	2010	PSF	yes
3.2	3.1	2010	PSF	yes

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(2) According to Richard Stallman, 1.6.1 is not GPL-compatible, because its license has a choice of law clause. According to CNRI, however, Stallman's lawyer has told CNRI's lawyer that 1.6.1 is "not incompatible" with the GPL.

Thanks to the many outside volunteers who have worked under Guido's direction to make these releases possible.

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1.29 cJSON 1.7.7

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1.30 zlib 1.2.3

1.30.1 Available under license :

```
/* zlib.h -- interface of the 'zlib' general purpose compression library
   version 1.2.11, January 15th, 2017
```

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1.31 nghttp2 1.47.0

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set yrange [0:]

set terminal pngcairo font 'Sans, 8' lw 1 size 1400,1024

set xtics rotate by -45

set style histogram errorbars gap 2 lw 1

set style fill solid border -1

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1.32 pcre 7.8

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Written by: Philip Hazel
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1.33 netkit-tftp 0.17

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1.34 procps 3.2.6

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```
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1.35 linux-kernel 2.6

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/* nicstar.c v0.22 Jawaid Bazyar (bazyar@hypermall.com)

* nicstar.c, M. Welsh (matt.welsh@cl.cam.ac.uk)

*

* Hacked October, 1997 by Jawaid Bazyar, Interlink Advertising Services Inc.

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* 10/1/97 - commented out CFG_PHYIE bit - we don't care when the PHY

* interrupts us (except possibly for removal/insertion of the cable?)

* 10/4/97 - began heavy inline documentation of the code. Corrected typos

* and spelling mistakes.

* 10/5/97 - added code to handle PHY interrupts, disable PHY on

* loss of link, and correctly re-enable PHY when link is

* re-established. (put back CFG_PHYIE)

*

* Modified to work with the IDT7721 nicstar -- AAL5 (tested) only.

*

* R. D. Rechenmacher <ron@fnal.gov>, Aug. 6, 1997 \$Revision: 1.1 \$ \$Date: 1999/08/20 11:00:11 \$

*
 * Linux driver for the IDT77201 NICStAR PCI ATM controller.
 * PHY component is expected to be 155 Mbps S/UNI-Lite or IDT 77155;
 * see init_nicstar() for PHY initialization to change this. This driver
 * expects the Linux ATM stack to support scatter-gather lists
 * (skb->atm.iovcnt != 0) for Rx skb's passed to vcc->push.
 *
 * Implementing minimal-copy of received data:
 * IDT always receives data into a small buffer, then large buffers
 * as needed. This means that data must always be copied to create
 * the linear buffer needed by most non-ATM protocol stacks (e.g. IP)
 * Fix is simple: make large buffers large enough to hold entire
 * SDU, and leave <small_buffer_data> bytes empty at the start. Then
 * copy small buffer contents to head of large buffer.
 * Trick is to avoid fragmenting Linux, due to need for a lot of large
 * buffers. This is done by 2 things:
 * 1) skb->destructor / skb->atm.recycle_buffer
 * combined, allow nicstar_free_rx_skb to be called to
 * recycle large data buffers
 * 2) skb_clone of received buffers
 * See nicstar_free_rx_skb and linearize_buffer for implementation
 * details.
 *
 *
 *
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 *
 * M. Welsh, 6 July 1996
 *
 *
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for the initial saa7146 driver and it's recent overhaul

Christian Theiss
for his work on the initial Linux DVB driver

Marcus Metzler <mocm@metzlerbros.de>
Ralph Metzler <rjkm@metzlerbros.de>
for their continuing work on the DVB driver

Michael Holz <kju@debian.org>
for his contributions to the dvb-net driver

Diego Picciani <d.picciani@novacom.it>
for CyberLogin for Linux which allows logging onto EON
(in case you are wondering where CyberLogin is, EON changed its login procedure and CyberLogin is no longer used.)

Martin Schaller <martin@smurf.franken.de>
for patching the cable card decoder driver

Klaus Schmidinger <Klaus.Schmidinger@cadsoft.de>
for various fixes regarding tuning, OSD and CI stuff and his work on VDR

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for his AFC kernel thread

Christoph Martin <martin@uni-mainz.de>
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for the or51211 and or51132 frontend drivers, and
for merging the nxt2002 and nxt2004 modules into a
single nxt200x frontend driver.

(If you think you should be in this list, but you are not, drop a line to the DVB mailing list)

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1.36 zopfli 1.0.1

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1.37 pycparser 2.18

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1.38 popt 1.5

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1.39 python 3.7.12

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In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations, which became Zope Corporation. In 2001, the Python Software Foundation (PSF, see <https://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation was a sponsoring member of the PSF.

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2.1	2.0+1.6.1	2001	PSF	no
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2.1.1	2.1+2.0.1	2001	PSF	yes
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1.40 libdnet 1.11

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1.41 libedit 2.1

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1.42 bash 2.05b

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```

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(at your option) any later version.
```

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```

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```
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```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

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1.43 libmnl 1.0.3

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```
30 atime=1337191922.583566431
```

```
30 ctime=1338052482.808834269
```

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Version 2.1, February 1999

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

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When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

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1.44 zlib 1.2.11

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1.45 libedit 2.1

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1.46 libnl3 3.2.5

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Version 2.1, February 1999

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1.47 zlib 1.2.5

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```
/* zlib.h -- interface of the 'zlib' general purpose compression library
   version 1.2.11, January 15th, 2017
```

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1.48 python-setuptools 47.1.0

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1.49 packaging 16.8

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1.50 erlang-otp 20.3.8.19

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THE C++ WRAPPER FUNCTIONS

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[Misc C library code]

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[zlib]

/* zlib.h -- interface of the 'zlib' general purpose compression library
version 1.2.3, July 18th, 2005

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Jean-loup Gailly Mark Adler
jloup@gzip.org madler@alumni.caltech.edu

The data format used by the zlib library is described by RFCs (Request for
Comments) 1950 to 1952 in the files <http://www.ietf.org/rfc/rfc1950.txt>
(zlib format), [rfc1951.txt](http://www.ietf.org/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](http://www.ietf.org/rfc/rfc1952.txt) (gzip format).

*/

[dialyzer]

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[hipe]

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[edoc, syntax_tools]

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[eunit]

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[leex]

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[eldap]

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THE BASIC LIBRARY FUNCTIONS

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1.51 sysv-init 2.78

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```
--- sysvinit-2.78/src/last.c.orig Sun May 27 18:51:14 2001
+++ sysvinit-2.78/src/last.c Wed Jun 13 22:04:25 2001
@@ -15,6 +15,10 @@
 * modify it under the terms of the GNU General Public License
 * as published by the Free Software Foundation; either version
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+ *
+ * Modified: 29 May 2001 Chris Wolf:
+ * Indicate entries without logout records, as gone, instead
+ * of logged in.
 */

#include <sys/types.h>
@@ -60,6 +64,7 @@
#define R_NORMAL 3 /* Normal */
#define R_NOW 4 /* Still logged in */
#define R_REBOOT 5 /* Reboot record. */
+#define R_PHANTOM 6 /* gone without logout record. */

/* Global variables */
int maxrecs = 0; /* Maximum number of records to list. */
@@ -389,6 +394,11 @@
    printf(logouttime, " still");
    printf(length, "logged in");
    break;
+ case R_PHANTOM:
+ length[0] = 0;
+ printf(logouttime, " gone");
+ printf(length, "- no logout");
```



```

+ break;
case R_REBOOT:
    logouttime[0] = 0; /* Print machine uptime */
    break;
@@ -690,21 +701,28 @@
    R_NORMAL);
    c = 1;
}
+
+ if (p->next) p->next->prev = p->prev;
+ if (p->prev)
+   p->prev->next = p->next;
+ else
+   utmplist = p->next;
+
+ free(p);
+ }
+ }
+ /*
- * Not found? Then crashed, down
- * or still logged in
+ * Not found? Then crashed, down, still logged in,
+ * or just missing logout record.
+ */
+ if (c == 0) {
- if (lastboot == 0)
-   quit = list(&ut, time(NULL), R_NOW);
+ if (lastboot == 0) {
+   /* check for process existence to see if really still logged in */
+   if (kill(ut.ut_pid, 0) && errno == ESRCH)
+     quit = list(&ut, time(NULL), R_PHANTOM);
+   else
+     quit = list(&ut, time(NULL), R_NOW);
+ }
+ else
+   quit = list(&ut, lastboot, whydown);
+ }

```

Found in path(s):

```
* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-
a6w8tbMx/sysvinit-2.78-lastgone.patch
```

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```
/*
```

```
* mesg.c The "mesg" utility. Gives / restrict access to
* your terminal by others.
```

```
*
```

```
* Usage: mesg [y|n].
```

* Without arguments prints out the current settings.

*

* This file is part of the sysvinit suite,

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*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/mesg.c

No license file was found, but licenses were detected in source scan.

/*

* utmpdump Simple program to dump UTMP and WTMP files in

* raw format, so they can be examined.

*

* Version: @(#)utmpdump.c 13-Aug-1996 1.00 miquels@cistron.nl

*

* This file is part of the sysvinit suite,

* Copyright 1991-1996 Miquel van Smoorenburg.

*

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*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/obsolete/utmpdump.c.OLD

No license file was found, but licenses were detected in source scan.

/*

* shutdown.c Shut the system down.

*

* Usage: shutdown [-krhfn] time [warning message]

* -k: don't really shutdown, only warn.

* -r: reboot after shutdown.

* -h: halt after shutdown.

* -f: do a 'fast' reboot (skip fsck).

* -F: Force fsck on reboot.

* -n: do not go through init but do it ourselves.

* -c: cancel an already running shutdown.

* -t secs: delay between SIGTERM and SIGKILL for init.

*
* Author: Miquel van Smoorenburg, miquels@cistron.nl
*
* Version: @(#)shutdown 2.78 13-Nov-1999 miquels@cistron.nl
*
* This file is part of the sysvinit suite,
* Copyright 1991-1999 Miquel van Smoorenburg.
*
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*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/shutdown.c

No license file was found, but licenses were detected in source scan.

/*
* powerd Monitor the DCD line of a serial port connected to
* an UPS. If the power goes down, notify init.
* If the power comes up again, notify init again.
* As long as the power is OK, the DCD line should be
* "HIGH". When the power fails, DCD should go "LOW".
* Powerd keeps DTR high so that you can connect
* DCD and DTR with a resistor of 10 Kilo Ohm and let the
* UPS or some relais pull the DCD line to ground.
* You also need to connect DTR and DSR together. This
* way, powerd can check now and then if DSR is high
* so it knows the UPS is connected!!
*
* Usage: powerd /dev/cua4 (or any other serial device).
*
* Author: Miquel van Smoorenburg, <miquels@drinkel.cistron.nl>.
*
* Version: 1.31, 29-Feb-1996.
*
* This program was originally written for my employer,
* ** Cistron Electronics **
* who has given kind permission to release this program
* for general puppose.
*
* Copyright 1991-1996 Cistron Electronics.
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*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/obsolete/powerd.c

No license file was found, but licenses were detected in source scan.

This is the Debian GNU/Linux prepackaged version of System V Init. Init was written by Miquel van Smoorenburg <miquels@drinkel.cistron.nl>.

This package was put together by Bruce Perens <Bruce@Pixar.com> from pre-distribution sources. Ian Murdock <imurdock@debian.org> integrated it into the base system maintained it until the end of 1995. Miquel van Smoorenburg <miquels@cistron.nl> has integrated debian support into the base package.

Changes:

29-January-1995 Bruce Perens <Bruce@Pixar.com>

Added Debian GNU/Linux package maintenance system files.

25-February-1995 Ian Murdock <imurdock@debian.org>

Finished integration of Sys V Init into the base system.

28-December-1995 Miquel van Smoorenburg <miquels@cistron.nl>

Added debian support to sysvinit.

For further changes see the ChangeLog file.

Init is Copyright (C) Miquel van Smoorenburg

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On Debian GNU/Linux systems, the complete text of the GNU General Public License can be found in ``usr/doc/copyright/GPL'`.

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/debian/README

No license file was found, but licenses were detected in source scan.

```
/*
* utmpdump Simple program to dump UTMP and WTMP files in
* raw format, so they can be examined.
*
* Author: Miquel van Smoorenburg, <miquels@cistron.nl>
*       Danek Duvall <duvall@alumni.princeton.edu>
* Date: 20-Dec-1998
* Version: 2.0
*
* This file is part of the sysvinit suite,
* Copyright 1991-1995 Miquel van Smoorenburg.
*
* Additional Copyright on this file 1998 Danek Duvall.
*
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* 2 of the License, or (at your option) any later version.
*/
```

Found in path(s):

```
*/opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-
a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/utmpdump.c
```

No license file was found, but licenses were detected in source scan.

Start-stop-daemon is the program that is used by the DEBIAN style init scripts to start and stop services. This program is part of the "dpkg" package by Ian Jackson. However there is also a separate C version (the original is in perl) available written by Marek Michalkiewicz. I'm including it for your convenience.

Note that the latest debian dpkg packages (4.0.18 and later) contain a much improved update-rc.d. This code is almost a year old.

The original announcement follows:

```
From: Marek Michalkiewicz <marekm@i17linuxb.ists.pwr.wroc.pl>
Message-Id: <199606060324.FAA19493@i17linuxb.ists.pwr.wroc.pl>
Subject: Fast start-stop-daemon in C
To: debian-devel@lists.debian.org
Date: Thu, 6 Jun 1996 05:24:18 +0200 (MET DST)
```

Some time ago I wrote a faster C replacement for the start-stop-daemon perl script. I use it for some time now (the most recent changes were just a nicer help screen; the code is quite stable).

This makes the system boot faster (especially on low end machines),

and important system startup scripts no longer depend on another big package (perl). Maybe in the future we can get to the point where a minimal system will work without perl installed at all (packages which need it in {pre,post}{inst,rm} scripts would depend on perl).

The only problem known so far to me is that I have to reinstall this program after every dpkg upgrade which overwrites it with that nice slooow perl script :-).

Just compile this program and drop the binary in /usr/sbin instead of the original /usr/sbin/start-stop-daemon perl script (make a copy of it first, just in case). See below for source code. I placed it in the public domain, but if it has to be GPL-ed to be included in dpkg, just tell me. Including it in dpkg would close Bug#1670.

I am posting it here so that it can be tested by more people than just me. Bugs are unlikely though.

Have fun,

Marek

Found in path(s):

```
* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/contrib/start-stop-daemon.README
No license file was found, but licenses were detected in source scan.
```

```
/*
```

```
* paths.h Paths of files that init and related utilities need.
```

```
*
```

```
* Version: @(#) paths.h 1.71 28-Dec-1995
```

```
*
```

```
* Author: Miquel van Smoorenburg, <miquels@cistron.nl>
```

```
*
```

```
* This file is part of the sysvinit suite,
```

```
* Copyright 1991-1997 Miquel van Smoorenburg.
```

```
*
```

```
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```

```
* modify it under the terms of the GNU General Public License
```

```
* as published by the Free Software Foundation; either version
```

```
* 2 of the License, or (at your option) any later version.
```

```
*/
```

Found in path(s):

```
* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/paths.h
```

```
No license file was found, but licenses were detected in source scan.
```

```
/*
 * last.c Re-implementation of the 'last' command, this time
 * for Linux. Yes I know there is BSD last, but I
 * just felt like writing this. No thanks :-).
 * Also, this version gives lots more info (especially with -x)
 *
 * Author: Miquel van Smoorenburg, miquels@cistron.nl
 *
 * Version: @(#)last 2.78 24-Nov-1999 miquels@cistron.nl
 *
 * This file is part of the sysvinit suite,
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 * 2 of the License, or (at your option) any later version.
 */
```

Found in path(s):

```
* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-
a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/last.c
```

No license file was found, but licenses were detected in source scan.

```
/*
 * bootlogd.c Store output from the console during bootup into a file.
 * The file is usually located on the /var partition, and
 * gets written (and fsynced) as soon as possible.
 *
 * Version: @(#)bootlogd 2.77 24-Aug-1999 miquels@cistron.nl
 *
 * Bugs: Uses openpty(), only available in glibc. Sorry.
 *
 * This file is part of the sysvinit suite,
 * Copyright 1991-1999 Miquel van Smoorenburg.
 *
 * This program is free software; you can redistribute it and/or
 * modify it under the terms of the GNU General Public License
 * as published by the Free Software Foundation; either version
 * 2 of the License, or (at your option) any later version.
 */
```

Found in path(s):

```
* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-
a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/bootlogd.c
```

No license file was found, but licenses were detected in source scan.

--- sysvinit-2.77/src/md5.c.be Fri Aug 20 14:05:19 1999

```

+++ sysvinit-2.77/src/md5.c Sat Jul 24 02:13:39 1999
@@ -0,0 +1,256 @@
+/*
+ * $Id: md5.c,v 1.1.1.2 1999/07/24 00:13:39 gafton Exp $
+ *
+ * This code implements the MD5 message-digest algorithm.
+ * The algorithm is due to Ron Rivest. This code was
+ * written by Colin Plumb in 1993, no copyright is claimed.
+ * This code is in the public domain; do with it what you wish.
+ *
+ * Equivalent code is available from RSA Data Security, Inc.
+ * This code has been tested against that, and is equivalent,
+ * except that you don't need to include two pages of legalese
+ * with every copy.
+ *
+ * To compute the message digest of a chunk of bytes, declare an
+ * MD5Context structure, pass it to MD5Init, call MD5Update as
+ * needed on buffers full of bytes, and then call MD5Final, which
+ * will fill a supplied 16-byte array with the digest.
+ *
+ */
+
+#include <string.h>
#include "md5.h"
+
+#ifndef HIGHFIRST
#define byteReverse(buf, len) /* Nothing */
#else
+static void byteReverse(unsigned char *buf, unsigned longs);
+
+#ifndef ASM_MD5
+/*
+ * Note: this code is harmless on little-endian machines.
+ */
+static void byteReverse(unsigned char *buf, unsigned longs)
+{
+ uint32 t;
+ do {
+ t = (uint32) (((unsigned) buf[3] << 8 | buf[2]) << 16 |
+ ((unsigned) buf[1] << 8 | buf[0]));
+ *(uint32 *) buf = t;
+ buf += 4;
+ } while (--longs);
+ }
+#endif
+#endif
+
+/*

```



```

+ * Start MD5 accumulation. Set bit count to 0 and buffer to mysterious
+ * initialization constants.
+ */
+void MD5Name(MD5Init)(struct MD5Context *ctx)
+{
+ ctx->buf[0] = 0x67452301U;
+ ctx->buf[1] = 0xefcdab89U;
+ ctx->buf[2] = 0x98badcfeU;
+ ctx->buf[3] = 0x10325476U;
+
+ ctx->bits[0] = 0;
+ ctx->bits[1] = 0;
+}
+
+/*
+ * Update context to reflect the concatenation of another buffer full
+ * of bytes.
+ */
+void MD5Name(MD5Update)(struct MD5Context *ctx, unsigned const char *buf, unsigned len)
+{
+ uint32 t;
+
+ /* Update bitcount */
+
+ t = ctx->bits[0];
+ if ((ctx->bits[0] = t + ((uint32) len << 3)) < t)
+ ctx->bits[1]++; /* Carry from low to high */
+ ctx->bits[1] += len >> 29;
+
+ t = (t >> 3) & 0x3f; /* Bytes already in shsInfo->data */
+
+ /* Handle any leading odd-sized chunks */
+
+ if (t) {
+ unsigned char *p = (unsigned char *) ctx->in + t;
+
+ t = 64 - t;
+ if (len < t) {
+ memcpy(p, buf, len);
+ return;
+ }
+ memcpy(p, buf, t);
+ byteReverse(ctx->in, 16);
+ MD5Name(MD5Transform)(ctx->buf, (uint32 *) ctx->in);
+ buf += t;
+ len -= t;
+ }
+ /* Process data in 64-byte chunks */

```

```

+
+ while (len >= 64) {
+ memcpy(ctx->in, buf, 64);
+ byteReverse(ctx->in, 16);
+ MD5Name(MD5Transform)(ctx->buf, (uint32 *) ctx->in);
+ buf += 64;
+ len -= 64;
+ }
+
+ /* Handle any remaining bytes of data. */
+
+ memcpy(ctx->in, buf, len);
+}
+
+/*
+ * Final wrapup - pad to 64-byte boundary with the bit pattern
+ * 1 0* (64-bit count of bits processed, MSB-first)
+ */
+void MD5Name(MD5Final)(unsigned char digest[16], struct MD5Context *ctx)
+{
+ unsigned count;
+ unsigned char *p;
+
+ /* Compute number of bytes mod 64 */
+ count = (ctx->bits[0] >> 3) & 0x3F;
+
+ /* Set the first char of padding to 0x80. This is safe since there is
+  always at least one byte free */
+ p = ctx->in + count;
+ *p++ = 0x80;
+
+ /* Bytes of padding needed to make 64 bytes */
+ count = 64 - 1 - count;
+
+ /* Pad out to 56 mod 64 */
+ if (count < 8) {
+ /* Two lots of padding: Pad the first block to 64 bytes */
+ memset(p, 0, count);
+ byteReverse(ctx->in, 16);
+ MD5Name(MD5Transform)(ctx->buf, (uint32 *) ctx->in);
+
+ /* Now fill the next block with 56 bytes */
+ memset(ctx->in, 0, 56);
+ } else {
+ /* Pad block to 56 bytes */
+ memset(p, 0, count - 8);
+ }
+ byteReverse(ctx->in, 14);

```

```

+
+ /* Append length in bits and transform */
+ ((uint32 *) ctx->in)[14] = ctx->bits[0];
+ ((uint32 *) ctx->in)[15] = ctx->bits[1];
+
+ MD5Name(MD5Transform)(ctx->buf, (uint32 *) ctx->in);
+ byteReverse((unsigned char *) ctx->buf, 4);
+ memcpy(digest, ctx->buf, 16);
+ memset(ctx, 0, sizeof(ctx)); /* In case it's sensitive */
+ }
+
+ #ifndef ASM_MD5
+
+ /* The four core functions - F1 is optimized somewhat */
+
+ /* #define F1(x, y, z) (x & y | ~x & z) */
+ #define F1(x, y, z) (z ^ (x & (y ^ z)))
+ #define F2(x, y, z) F1(z, x, y)
+ #define F3(x, y, z) (x ^ y ^ z)
+ #define F4(x, y, z) (y ^ (x | ~z))
+
+ /* This is the central step in the MD5 algorithm. */
+ #define MD5STEP(f, w, x, y, z, data, s) \
+ ( w += f(x, y, z) + data, w = w<<s | w>>(32-s), w += x )
+
+ /*
+ * The core of the MD5 algorithm, this alters an existing MD5 hash to
+ * reflect the addition of 16 longwords of new data. MD5Update blocks
+ * the data and converts bytes into longwords for this routine.
+ */
+ void MD5Name(MD5Transform)(uint32 buf[4], uint32 const in[16])
+ {
+     register uint32 a, b, c, d;
+
+     + a = buf[0];
+     + b = buf[1];
+     + c = buf[2];
+     + d = buf[3];
+
+     + MD5STEP(F1, a, b, c, d, in[0] + 0xd76aa478U, 7);
+     + MD5STEP(F1, d, a, b, c, in[1] + 0xe8c7b756U, 12);
+     + MD5STEP(F1, c, d, a, b, in[2] + 0x242070dbU, 17);
+     + MD5STEP(F1, b, c, d, a, in[3] + 0xc1bdceeU, 22);
+     + MD5STEP(F1, a, b, c, d, in[4] + 0xf57c0fafU, 7);
+     + MD5STEP(F1, d, a, b, c, in[5] + 0x4787c62aU, 12);
+     + MD5STEP(F1, c, d, a, b, in[6] + 0xa8304613U, 17);
+     + MD5STEP(F1, b, c, d, a, in[7] + 0xfd469501U, 22);
+     + MD5STEP(F1, a, b, c, d, in[8] + 0x698098d8U, 7);

```

+ MD5STEP(F1, d, a, b, c, in[9] + 0x8b44f7afU, 12);
 + MD5STEP(F1, c, d, a, b, in[10] + 0xffff5bb1U, 17);
 + MD5STEP(F1, b, c, d, a, in[11] + 0x895cd7beU, 22);
 + MD5STEP(F1, a, b, c, d, in[12] + 0x6b901122U, 7);
 + MD5STEP(F1, d, a, b, c, in[13] + 0xfd987193U, 12);
 + MD5STEP(F1, c, d, a, b, in[14] + 0xa679438eU, 17);
 + MD5STEP(F1, b, c, d, a, in[15] + 0x49b40821U, 22);
 +
 + MD5STEP(F2, a, b, c, d, in[1] + 0xf61e2562U, 5);
 + MD5STEP(F2, d, a, b, c, in[6] + 0xc040b340U, 9);
 + MD5STEP(F2, c, d, a, b, in[11] + 0x265e5a51U, 14);
 + MD5STEP(F2, b, c, d, a, in[0] + 0xe9b6c7aaU, 20);
 + MD5STEP(F2, a, b, c, d, in[5] + 0xd62f105dU, 5);
 + MD5STEP(F2, d, a, b, c, in[10] + 0x02441453U, 9);
 + MD5STEP(F2, c, d, a, b, in[15] + 0xd8a1e681U, 14);
 + MD5STEP(F2, b, c, d, a, in[4] + 0xe7d3fbc8U, 20);
 + MD5STEP(F2, a, b, c, d, in[9] + 0x21e1cde6U, 5);
 + MD5STEP(F2, d, a, b, c, in[14] + 0xc33707d6U, 9);
 + MD5STEP(F2, c, d, a, b, in[3] + 0xf4d50d87U, 14);
 + MD5STEP(F2, b, c, d, a, in[8] + 0x455a14edU, 20);
 + MD5STEP(F2, a, b, c, d, in[13] + 0xa9e3e905U, 5);
 + MD5STEP(F2, d, a, b, c, in[2] + 0xfcefa3f8U, 9);
 + MD5STEP(F2, c, d, a, b, in[7] + 0x676f02d9U, 14);
 + MD5STEP(F2, b, c, d, a, in[12] + 0x8d2a4c8aU, 20);
 +
 + MD5STEP(F3, a, b, c, d, in[5] + 0xfffa3942U, 4);
 + MD5STEP(F3, d, a, b, c, in[8] + 0x8771f681U, 11);
 + MD5STEP(F3, c, d, a, b, in[11] + 0x6d9d6122U, 16);
 + MD5STEP(F3, b, c, d, a, in[14] + 0xfde5380cU, 23);
 + MD5STEP(F3, a, b, c, d, in[1] + 0xa4beea44U, 4);
 + MD5STEP(F3, d, a, b, c, in[4] + 0x4bdecfa9U, 11);
 + MD5STEP(F3, c, d, a, b, in[7] + 0xf6bb4b60U, 16);
 + MD5STEP(F3, b, c, d, a, in[10] + 0xebefbc70U, 23);
 + MD5STEP(F3, a, b, c, d, in[13] + 0x289b7ec6U, 4);
 + MD5STEP(F3, d, a, b, c, in[0] + 0xeea127faU, 11);
 + MD5STEP(F3, c, d, a, b, in[3] + 0xd4ef3085U, 16);
 + MD5STEP(F3, b, c, d, a, in[6] + 0x04881d05U, 23);
 + MD5STEP(F3, a, b, c, d, in[9] + 0xd9d4d039U, 4);
 + MD5STEP(F3, d, a, b, c, in[12] + 0xe6db99e5U, 11);
 + MD5STEP(F3, c, d, a, b, in[15] + 0x1fa27cf8U, 16);
 + MD5STEP(F3, b, c, d, a, in[2] + 0xc4ac5665U, 23);
 +
 + MD5STEP(F4, a, b, c, d, in[0] + 0xf4292244U, 6);
 + MD5STEP(F4, d, a, b, c, in[7] + 0x432aff97U, 10);
 + MD5STEP(F4, c, d, a, b, in[14] + 0xab9423a7U, 15);
 + MD5STEP(F4, b, c, d, a, in[5] + 0xfc93a039U, 21);
 + MD5STEP(F4, a, b, c, d, in[12] + 0x655b59c3U, 6);
 + MD5STEP(F4, d, a, b, c, in[3] + 0x8f0ccc92U, 10);

```

+ MD5STEP(F4, c, d, a, b, in[10] + 0xffeff47dU, 15);
+ MD5STEP(F4, b, c, d, a, in[1] + 0x85845dd1U, 21);
+ MD5STEP(F4, a, b, c, d, in[8] + 0x6fa87e4fU, 6);
+ MD5STEP(F4, d, a, b, c, in[15] + 0xfe2ce6e0U, 10);
+ MD5STEP(F4, c, d, a, b, in[6] + 0xa3014314U, 15);
+ MD5STEP(F4, b, c, d, a, in[13] + 0x4e0811a1U, 21);
+ MD5STEP(F4, a, b, c, d, in[4] + 0xf7537e82U, 6);
+ MD5STEP(F4, d, a, b, c, in[11] + 0xbd3af235U, 10);
+ MD5STEP(F4, c, d, a, b, in[2] + 0x2ad7d2bbU, 15);
+ MD5STEP(F4, b, c, d, a, in[9] + 0xeb86d391U, 21);
+
+ buf[0] += a;
+ buf[1] += b;
+ buf[2] += c;
+ buf[3] += d;
+}
+
+##endif
--- sysvinit-2.77/src/md5.h.be Fri Aug 20 14:05:22 1999
+++ sysvinit-2.77/src/md5.h Fri Aug 20 13:54:09 1999
@@ -0,0 +1,40 @@
+#ifndef MD5_H
+#define MD5_H
+
+#include <features.h>
+#if defined(__GLIBC__) && __GLIBC__ > 1
+# include <stdint.h>
+typedef uint32_t uint32;
+#else
+# ifdef __alpha
+typedef unsigned int uint32;
+# else
+typedef unsigned long uint32;
+# endif
+#endif
+
+struct MD5Context {
+  uint32 buf[4];
+  uint32 bits[2];
+  unsigned char in[64];
+};
+
+void GoodMD5Init(struct MD5Context *);
+void GoodMD5Update(struct MD5Context *, unsigned const char *, unsigned);
+void GoodMD5Final(unsigned char digest[16], struct MD5Context *);
+void GoodMD5Transform(uint32 buf[4], uint32 const in[16]);
+void BrokenMD5Init(struct MD5Context *);
+void BrokenMD5Update(struct MD5Context *, unsigned const char *, unsigned);

```

```

+void BrokenMD5Final(unsigned char digest[16], struct MD5Context *);
+void BrokenMD5Transform(uint32 buf[4], uint32 const in[16]);
+
+char *Goodcrypt_md5(const char *pw, const char *salt);
+char *Brokencrypt_md5(const char *pw, const char *salt);
+
+/*
+* This is needed to make RSAREF happy on some MS-DOS compilers.
+*/
+
+typedef struct MD5Context MD5_CTX;
+
+#endif /* MD5_H */
--- sysvinit-2.77/src/md5_crypt.c.be Fri Aug 20 14:05:25 1999
+++ sysvinit-2.77/src/md5_crypt.c Sat Jul 24 02:13:39 1999
@@ -0,0 +1,149 @@
+/*
+ * $Id: md5_crypt.c,v 1.1.1.1 1999/07/24 00:13:39 gafton Exp $
+ *
+ * -----
+ * "THE BEER-WARE LICENSE" (Revision 42):
+ * <phk@login.dknet.dk> wrote this file. As long as you retain this notice you
+ * can do whatever you want with this stuff. If we meet some day, and you think
+ * this stuff is worth it, you can buy me a beer in return. Poul-Henning Kamp
+ * -----
+ *
+ * Origin: Id: crypt.c,v 1.3 1995/05/30 05:42:22 rgrimes Exp
+ *
+ */
+
+#include <string.h>
+#include "md5.h"
+
+static unsigned char itoa64[] = /* 0 ... 63 => ascii - 64 */
+ ".0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz";
+
+static void to64(char *s, unsigned long v, int n)
+{
+ while (--n >= 0) {
+ *s++ = itoa64[v & 0x3f];
+ v >>= 6;
+ }
+ }
+
+/*
+ * UNIX password
+ *
+ * Use MD5 for what it is best at...

```

```

+ */
+
+char *MD5Name(crypt_md5)(const char *pw, const char *salt)
+{
+ const char *magic = "$1$";
+ /* This string is magic for this algorithm. Having
+ * it this way, we can get get better later on */
+ static char passwd[120], *p;
+ static const char *sp, *ep;
+ unsigned char final[16];
+ int sl, pl, i, j;
+ MD5_CTX ctx, ctx1;
+ unsigned long l;
+
+ /* Refine the Salt first */
+ sp = salt;
+
+ /* If it starts with the magic string, then skip that */
+ if (!strncmp(sp, magic, strlen(magic)))
+ sp += strlen(magic);
+
+ /* It stops at the first '$', max 8 chars */
+ for (ep = sp; *ep && *ep != '$' && ep < (sp + 8); ep++)
+ continue;
+
+ /* get the length of the true salt */
+ sl = ep - sp;
+
+ MD5Name(MD5Init>(&ctx);
+
+ /* The password first, since that is what is most unknown */
+ MD5Name(MD5Update>(&ctx,(unsigned const char *)pw,strlen(pw));
+
+ /* Then our magic string */
+ MD5Name(MD5Update>(&ctx,(unsigned const char *)magic,strlen(magic));
+
+ /* Then the raw salt */
+ MD5Name(MD5Update>(&ctx,(unsigned const char *)sp,sl);
+
+ /* Then just as many characters of the MD5(pw,salt,pw) */
+ MD5Name(MD5Init>(&ctx1);
+ MD5Name(MD5Update>(&ctx1,(unsigned const char *)pw,strlen(pw));
+ MD5Name(MD5Update>(&ctx1,(unsigned const char *)sp,sl);
+ MD5Name(MD5Update>(&ctx1,(unsigned const char *)pw,strlen(pw));
+ MD5Name(MD5Final)(final,&ctx1);
+ for (pl = strlen(pw); pl > 0; pl -= 16)
+ MD5Name(MD5Update>(&ctx,(unsigned const char *)final,pl>16 ? 16 : pl);
+

```

```

+ /* Don't leave anything around in vm they could use. */
+ memset(final, 0, sizeof final);
+
+ /* Then something really weird... */
+ for (j = 0, i = strlen(pw); i >>= 1)
+   if (i & 1)
+     MD5Name(MD5Update>(&ctx, (unsigned const char *)final+j, 1);
+   else
+     MD5Name(MD5Update>(&ctx, (unsigned const char *)pw+j, 1);
+
+ /* Now make the output string */
+ strcpy(passwd, magic);
+ strncat(passwd, sp, sl);
+ strcat(passwd, "$");
+
+ MD5Name(MD5Final)(final,&ctx);
+
+ /*
+  * and now, just to make sure things don't run too fast
+  * On a 60 Mhz Pentium this takes 34 msec, so you would
+  * need 30 seconds to build a 1000 entry dictionary...
+  */
+ for (i = 0; i < 1000; i++) {
+   MD5Name(MD5Init>(&ctx1);
+   if (i & 1)
+     MD5Name(MD5Update>(&ctx1,(unsigned const char *)pw,strlen(pw));
+   else
+     MD5Name(MD5Update>(&ctx1,(unsigned const char *)final,16);
+
+   if (i % 3)
+     MD5Name(MD5Update>(&ctx1,(unsigned const char *)sp,sl);
+
+   if (i % 7)
+     MD5Name(MD5Update>(&ctx1,(unsigned const char *)pw,strlen(pw));
+
+   if (i & 1)
+     MD5Name(MD5Update>(&ctx1,(unsigned const char *)final,16);
+   else
+     MD5Name(MD5Update>(&ctx1,(unsigned const char *)pw,strlen(pw));
+   MD5Name(MD5Final)(final,&ctx1);
+ }
+
+ p = passwd + strlen(passwd);
+
+ l = (final[0] << 16) | (final[6] << 8) | final[12];
+ to64(p, l, 4);
+ p += 4;
+ l = (final[1] << 16) | (final[7] << 8) | final[13];

```



```

+ to64(p, 1, 4);
+ p += 4;
+ l = (final[2] << 16) | (final[8] << 8) | final[14];
+ to64(p, 1, 4);
+ p += 4;
+ l = (final[3] << 16) | (final[9] << 8) | final[15];
+ to64(p, 1, 4);
+ p += 4;
+ l = (final[4] << 16) | (final[10] << 8) | final[5];
+ to64(p, 1, 4);
+ p += 4;
+ l = final[11];
+ to64(p, 1, 2);
+ p += 2;
+ *p = '\0';
+
+ /* Don't leave anything around in vm they could use. */
+ memset(final, 0, sizeof final);
+
+ return passwd;
+}
--- sysvinit-2.77/src/Makefile.be Fri Aug 20 12:05:26 1999
+++ sysvinit-2.77/src/Makefile Fri Aug 20 14:20:42 1999
@@ -50,8 +50,8 @@ utmpdump: utmpdump.o
runlevel: runlevel.o
$(CC) $(LDFLAGS) -o $@ runlevel.o

-sulogin: sulogin.o
- $(CC) $(LDFLAGS) $(STATIC) -o $@ sulogin.o $(LCRYPT)
+sulogin: sulogin.o md5_broken.o md5_crypt_broken.o
+ $(CC) $(LDFLAGS) $(STATIC) -o $@ $^ $(LCRYPT)

wall: dowall.o wall.o
$(CC) $(LDFLAGS) -o $@ dowall.o wall.o
@@ -67,6 +67,12 @@ utmp.o: utmp.c init.h

init_utm.o: utmp.c init.h
$(CC) -c $(CFLAGS) -DINIT_MAIN utmp.c -o init_utm.o
+
+md5_broken.o: md5.c
+ $(CC) $(CFLAGS) -D'MD5Name(x)=Broken##x' -c $< -o $@
+
+md5_crypt_broken.o: md5_crypt.c
+ $(CC) $(CFLAGS) -D'MD5Name(x)=Broken##x' -c $< -o $@

cleanobjs:
rm -f *.o *.bak
--- sysvinit-2.77/src/sulogin.c.be Fri Aug 20 12:05:26 1999

```

```

+++ sysvinit-2.77/src/sulogin.c Fri Aug 20 14:20:09 1999
@@ -29,6 +29,7 @@
#if defined(__GLIBC__)
# include <crypt.h>
#endif
+#include "md5.h"

#define CHECK_DES 1
#define CHECK_MD5 1
@@ -392,7 +393,12 @@ int main(int argc, char **argv)
while(1) {
    if ((p = getpasswd()) == NULL) break;
    if (pwd->pw_passwd[0] == 0 ||
-    strcmp(crypt(p, pwd->pw_passwd), pwd->pw_passwd) == 0)
+    strcmp(crypt(p, pwd->pw_passwd), pwd->pw_passwd) == 0
+#ifdef CHECK_MD5
+    || (strncmp(pwd->pw_passwd, "$1$", 3) == 0 &&
+    strcmp(Brokenencrypt_md5(p, pwd->pw_passwd), pwd->pw_passwd) == 0)
+#endif
+    )
        sushell(pwd);
        printf("Login incorrect.\n");
    }

```

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.77-md5-be.patch

No license file was found, but licenses were detected in source scan.

```

/*
* Init A System-V Init Clone.
*
* Usage: /sbin/init
*   init [0123456SsQqAaBbCc]
*   telinit [0123456SsQqAaBbCc]
*
* Version: @(#)init.c 2.78 11-Feb-2000 miquels@cistron.nl
*
* This file is part of the sysvinit suite,
* Copyright 1991-2000 Miquel van Smoorenburg.
*
* This program is free software; you can redistribute it and/or
* modify it under the terms of the GNU General Public License
* as published by the Free Software Foundation; either version
* 2 of the License, or (at your option) any later version.
*
* Modified: 21 Feb 1998, Al Viro:
* 'U' flag added to telinit. It forces init to re-exec itself

```

- * (passing its state through exec, certainly).
- * May be useful for smoother (heh) upgrades.
- * 24 Feb 1998, AV:
- * did_boot made global and added to state - thanks, Miquel.
- * Yet another file descriptors leak - close state pipe if
- * re_exec fails.
- */

Found in path(s):

*/opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/init.c

No license file was found, but licenses were detected in source scan.

/*

- * Halt Stop the system running.
- * It re-enables CTRL-ALT-DEL, so that a hard reboot can
- * be done. If called as reboot, it will reboot the system.
- *
- * If the system is not in runlevel 0 or 6, halt will just
- * execute a "shutdown -h" to halt the system, and reboot will
- * execute an "shutdown -r". This is for compatibility with
- * sysvinit 2.4.
- *
- * Usage: halt [-n] [-w] [-d] [-f] [-p]
- * -n: don't sync before halting the system
- * -w: only write a wtmp reboot record and exit.
- * -d: don't write a wtmp record.
- * -f: force halt/reboot, don't call shutdown.
- * -p: power down the system (if possible, otherwise halt)
- *
- * Reboot and halt are both this program. Reboot
- * is just a link to halt. Invoking the program
- * as poweroff implies the -p option.
- *
- * Author: Miquel van Smoorenburg, miquels@cistron.nl
- *
- * Version: 2.74, 24-Feb-1998
- *
- * This file is part of the sysvinit suite,
- * Copyright 1991-1998 Miquel van Smoorenburg.
- *
- * This program is free software; you can redistribute it and/or
- * modify it under the terms of the GNU General Public License
- * as published by the Free Software Foundation; either version
- * 2 of the License, or (at your option) any later version.
- */

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/halt.c

No license file was found, but licenses were detected in source scan.

/*

* wall.c Write to all users logged in.

*

* Usage: wall [text]

*

* Version: @(#)wall 2.75 28-Jul-1998 miquels@cistron.nl

*

* This file is part of the sysvinit suite,

* Copyright 1991-1998 Miquel van Smoorenburg.

*

* This program is free software; you can redistribute it and/or

* modify it under the terms of the GNU General Public License

* as published by the Free Software Foundation; either version

* 2 of the License, or (at your option) any later version.

*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/wall.c

No license file was found, but licenses were detected in source scan.

/*

* A rewrite of the original Debian's start-stop-daemon Perl script

* in C (faster - it is executed many times during system startup).

*

* Written by Marek Michalkiewicz <marekm@i17linuxb.ists.pwr.wroc.pl>,

* public domain.

*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/contrib/start-stop-daemon.c

No license file was found, but licenses were detected in source scan.

/*

* kilall5.c Kill all processes except processes that have the

* same session id, so that the shell that called us

* won't be killed. Typically used in shutdown scripts.

*

* pidof.c Tries to get the pid of the process[es] named.

*

* Version: 2.30 03-Jul-1996 rhm MvS

*

* Usage: killall5 [-][signal]

```
* pidof [-s] [-o omitpid [-o omitpid]] program [program..]
*
* Authors: Miquel van Smoorenburg, miquels@drinkel.cistron.nl
*
* Riku Meskanen, <mesrik@jyu.fi>
* - return all running pids of given program name
* - single shot '-s' option for backwards combatibility
* - omit pid '-o' option and %PPID (parent pid metavariable)
* - syslog() only if not a connected to controlling terminal
* - swapped out programs pids are caught now
*
* This file is part of the sysvinit suite,
* Copyright 1991-1996 Miquel van Smoorenburg.
*
* This program is free software; you can redistribute it and/or
* modify it under the terms of the GNU General Public License
* as published by the Free Software Foundation; either version
* 2 of the License, or (at your option) any later version.
*/
```

Found in path(s):

```
*/opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-
a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/killall5.c
```

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* dowall.c Write to all users on the system.
```

```
*
```

```
* Author: Miquel van Smoorenburg, miquels@cistron.nl
```

```
*
```

```
* Version: @(#)dowall.c 2.76 19-Apr-1999 miquels@cistron.nl
```

```
*
```

```
* This file is part of the sysvinit suite,
```

```
* Copyright 1991-1999 Miquel van Smoorenburg.
```

```
*
```

```
* This program is free software; you can redistribute it and/or
```

```
* modify it under the terms of the GNU General Public License
```

```
* as published by the Free Software Foundation; either version
```

```
* 2 of the License, or (at your option) any later version.
```

```
*/
```

Found in path(s):

```
*/opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-
a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/dowall.c
```

No license file was found, but licenses were detected in source scan.

README for the System V style init, version 2.78

init, shutdown, halt, reboot, wall, last, mesg, runlevel,
killall5, pidof, sulogin.

All programs, files and scripts in this package are covered by
the Gnu Public License, and copyrighted by me.

If you are not using Debian and the debianized package,
you will have to install the new init by hand. You should
be able to drop the binaries into a Slackware 3.x or Redhat 4.x
system, I think.

Here is a list of preferred directories to install the progs & manpages:

wall.1, last.1, mesg.1 /usr/man/man1
inittab.5, initscript.5 /usr/man/man5
init.8, halt.8, reboot.8,
shutdown.8, powerd.8,
killall5.8, pidof.8,
runlevel.8, sulogin.8 /usr/man/man8

init /sbin/init
inittab /etc/inittab
initscript.sample /etc/initscript.sample
telinit a link (with ln(1)) to init, either
in /bin or in /sbin.
halt /sbin/halt
reboot a link to /sbin/halt in the same directory
killall5 /sbin/killall5
pidof a link to /sbin/killall5 in the same directory.
runlevel /sbin/runlevel
shutdown /sbin/shutdown.
wall /usr/bin/wall
mesg /usr/bin/mesg
last /usr/bin/last
sulogin /sbin/sulogin
bootlogd /sbin/bootlogd
utmpdump don't install, it's just a debug thingy.

If you already have a "wall" in /bin (the SLS release has, for example)
do not install this wall. Chances are that the wall you are already
using is linked to /bin/write. Either first remove /bin/wall before
installing the new one, or don't install the new one at all.

You might want to create a file called "/etc/shutdown.allow". Read the
manual page on shutdown to find out more about this.

Running from a read-only file system (CDROM?):

o All communication to init goes through the FIFO /dev/initctl.

There should be no problem using a read-only root file system
IF you use a Linux kernel > 1.3.66. Older kernels don't allow
writing to a FIFO on a read-only file system.

Miquel van Smoorenburg <miquels@cistron.nl>

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/doc/Install

No license file was found, but licenses were detected in source scan.

/*

* runlevel Prints out the previous and the current runlevel.

*

* Version: @(#)runlevel 1.20 16-Apr-1997 MvS

*

* This file is part of the sysvinit suite,

* Copyright 1991-1997 Miquel van Smoorenburg.

*

* This program is free software; you can redistribute it and/or

* modify it under the terms of the GNU General Public License

* as published by the Free Software Foundation; either version

* 2 of the License, or (at your option) any later version.

*/

Found in path(s):

* /opt/cola/permits/1606678434_1680703456.7423089/0/SysVinit-2.78-19.src.rpm-cosi-expand-archive-a6w8tbMx/sysvinit-2.78.tar.gz-cosi-expand-archive-t57fFr56/sysvinit-2.78/src/runlevel.c

1.52 libpcap 0.9.2

1.52.1 Available under license :

License: BSD

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1.53 ftpd-bsd 0.3.2

1.53.1 Available under license :

```
# $OpenBSD: Makefile,v 1.5 1999/02/23 23:54:16 art Exp $

PROG= ls
SRCS= cmp.c stat_flags.c ls.c main.c print.c util.c

.include <bsd.prog.mk>
#%PAM-1.0
auth    required /lib/security/pam_listfile.so item=user sense=deny file=/etc/ftpusers onerr=succeed
auth    required /lib/security/pam_pwdb.so shadow nullok
auth    required /lib/security/pam_shells.so
account required /lib/security/pam_pwdb.so
session required /lib/security/pam_pwdb.so
# $OpenBSD: Makefile,v 1.16 2000/03/01 17:27:28 deraadt Exp $
# $NetBSD: Makefile,v 1.13 1996/02/16 02:07:41 cgd Exp $
# @(#)Makefile 8.2 (Berkeley) 4/4/94

PROG= ftpd
CFLAGS+=-DHASSETPROCTITLE -Dunix
SRCS= ftpd.c ftpcmd.c logutmp.c logwtmp.c popen.c
MAN= ftpd.8
CLEANFILES+=ftpcmd.c y.tab.h

.include <bsd.own.mk>

# our internal version of ls.

LSDIR = ${.CURDIR}/../bin/ls
.PATH: ${LSDIR}
SRCS += ls.c cmp.c print.c stat_flags.c util.c
CFLAGS += -I${LSDIR}

# not really used
CPPFLAGS+=-DINET6

.if (${SKEY} == "yes")
CFLAGS+=-DSKEY
LDADD+= -lskey
DPADD+= ${LIBSKEY}
.endif
```



```
.if (${KERBEROS} == "yes")
SRCS+= klogin.c
.PATH: ${CURDIR}/../usr.bin/login
CFLAGS+= -DKERBEROS
LDADD+= -lkafs -lkrb -ldes
DPADD+= ${LIBKRB} ${LIBKRB} ${LIBKAFS}
.endif
```

```
.if (${TCP_WRAPPERS} == "yes")
CFLAGS+=-DTCPWRAPPERS
LDADD+= -lwrap
DPADD+= ${LIBWRAP}
.endif
```

```
.include <bsd.prog.mk>
  A WARNING ABOUT GMT VS LOCALTIME
to people using ftpd-BSD-0.3.0 to serve anonymous FTP
who consider moving to ftpd-BSD-0.3.1
```

David A. Madore <david.madore@ens.fr>

(This warning should be included in the ftpd-BSD-0.3.1 distribution, but I discovered this after packaging, and I did not want to repackage, resign the tarball, rebuild the RPMs and resign them. So it will stay as a separate file.)

The FTP protocol is a bit old and does not specify in what format the file listings returned by the LIST and STAT commands are to be given. Traditionally, the Unix `ls` program is run, so it has become the *de facto* standard for the commands' output format; many programs expect this and parse accordingly.

One thing is certainly not specified, and that is whether the time of last modification returned for the files listed is given in local time (the time in the server's time zone) or universal time (UT, aka Greenwich Mean Time or GMT).

Under Linux, the time format returned by the `ctime()` function in the (GNU) `libc` is determined by the contents of the `/etc/localtime` file which can be overridden by the `TZ` environment variable if it exists; if nothing is specified (e.g. if the `/etc/localtime` file does not exist), universal time is used (as is the case if `TZ=GMT`).

Version 0.3.0 of ftpd-BSD used an external `ls` program. In the case of anonymous ftp, this `ls` runs in a `chroot()`ed environment, and it frequently does not have an `/etc/localtime` file on which to rely, so

it returns the time in GMT. Version 0.3.1, on the other hand, uses an internal ls function, so its time zone is initialized when the ftpd program is run, before the chroot() call is made, and the time zone used is typically the computer's local time. This means that simply moving from ftpd-BSD-0.3.0 to ftpd-BSD-0.3.1 without further precaution will offset all the last modification times returned by the LIST and STAT commands. If you live east of Greenwich, this could result in mirror sites needlessly downloading all files, thinking they have changed; if you live west of Greenwich, this could result in mirror sites not downloading files which they should have.

This may very well turn out to be a non-issue. I am not sure exactly how mirroring programs work. If you do not have any mirror sites, or if you use only non-anonymous FTP, the issue is moot.

One workaround is to start ftpd with TZ=GMT set. This generally means starting inetd with TZ=GMT. Beware, though, that environments tend to be inherited quite far, and even telnetd will have TZ=GMT and if you telnet into your machine you might have universal time instead of local time as you expect (but you can always unset TZ or position it as you like, e.g. TZ=US/Eastern). Another solution is not to use the internal ls command (in which case you might as well stick to version 0.3.0). Finally, you can decide to stick to local time, but I do not recommend this as the clients have no way of knowing the server's time zone (personally I think local time is good only when talking to humans, and everything else should always use universal time: this is the strategy taken by the HTTP protocol for example).

I would appreciate it if FTP experts could tell me more about this problem. I have read about Bernstein's easily parsed LIST format (see <http://cr.yip.to/ftp/list/eplf.html> for a description), and I wonder whether it is worth implementing (in particular, whether some clients understand it): I might try contacting the OpenBSD people about this.

--

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1.54 pcre 8.41

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1.55 iptutils 20070202

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1.56 libusb 1.0.9

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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- a) The modified work must itself be a software library.
- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
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- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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- b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.
- c) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

d) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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Appendix: How to Apply These Terms to Your New Libraries

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<one line to give the library's name and a brief idea of what it does.>

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1.58 glib 2.46.2

1.58.1 Available under license :

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

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2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

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End

/*****

* Perl-Compatible Regular Expressions *

*****/

/* This is the public header file for the PCRE library, to be #included by applications that call the PCRE functions.

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POSSIBILITY OF SUCH DAMAGE.

*/

```
#ifndef _PCRE_H  
#define _PCRE_H
```

```
/* The current PCRE version information. */
```

```
#define PCRE_MAJOR      8  
#define PCRE_MINOR      31  
#define PCRE_PRERELEASE  
#define PCRE_DATE       2012-07-06
```

```
/* When an application links to a PCRE DLL in Windows, the symbols that are  
imported have to be identified as such. When building PCRE, the appropriate  
export setting is defined in pcre_internal.h, which includes this file. So we  
don't change existing definitions of PCRE_EXP_DECL and PCRECPP_EXP_DECL. */
```

```
#if defined(_WIN32) && !defined(PCRE_STATIC)  
# ifndef PCRE_EXP_DECL
```

```

# define PCRE_EXP_DECL extern __declspec(dllimport)
# endif
# ifdef __cplusplus
#   ifndef PCRECPP_EXP_DECL
#     define PCRECPP_EXP_DECL extern __declspec(dllimport)
#   endif
#   ifndef PCRECPP_EXP_DEFN
#     define PCRECPP_EXP_DEFN __declspec(dllimport)
#   endif
# endif
#endif

/* By default, we use the standard "extern" declarations. */

#ifndef PCRE_EXP_DECL
# ifdef __cplusplus
#   define PCRE_EXP_DECL extern "C"
# else
#   define PCRE_EXP_DECL extern
# endif
#endif

#ifdef __cplusplus
# ifndef PCRECPP_EXP_DECL
#   define PCRECPP_EXP_DECL extern
# endif
# ifndef PCRECPP_EXP_DEFN
#   define PCRECPP_EXP_DEFN
# endif
#endif

/* Have to include stdlib.h in order to ensure that size_t is defined;
it is needed here for malloc. */

#include <stdlib.h>

/* Allow for C++ users */

#ifdef __cplusplus
extern "C" {
#endif

/* Options. Some are compile-time only, some are run-time only, and some are
both, so we keep them all distinct. However, almost all the bits in the options
word are now used. In the long run, we may have to re-use some of the
compile-time only bits for runtime options, or vice versa. In the comments
below, "compile", "exec", and "DFA exec" mean that the option is permitted to
be set for those functions; "used in" means that an option may be set only for

```

compile, but is subsequently referenced in exec and/or DFA exec. Any of the compile-time options may be inspected during studying (and therefore JIT compiling). */

```
#define PCRE_CASELESS      0x00000001 /* Compile */
#define PCRE_MULTILINE     0x00000002 /* Compile */
#define PCRE_DOTALL       0x00000004 /* Compile */
#define PCRE_EXTENDED     0x00000008 /* Compile */
#define PCRE_ANCHORED     0x00000010 /* Compile, exec, DFA exec */
#define PCRE_DOLLAR_ENDONLY 0x00000020 /* Compile, used in exec, DFA exec */
#define PCRE_EXTRA        0x00000040 /* Compile */
#define PCRE_NOTBOL       0x00000080 /* Exec, DFA exec */
#define PCRE_NOTEOL       0x00000100 /* Exec, DFA exec */
#define PCRE_UNGREEDY     0x00000200 /* Compile */
#define PCRE_NOTEMPTY     0x00000400 /* Exec, DFA exec */
/* The next two are also used in exec and DFA exec */
#define PCRE_UTF8         0x00000800 /* Compile (same as PCRE_UTF16) */
#define PCRE_UTF16       0x00000800 /* Compile (same as PCRE_UTF8) */
#define PCRE_NO_AUTO_CAPTURE 0x00001000 /* Compile */
/* The next two are also used in exec and DFA exec */
#define PCRE_NO_UTF8_CHECK 0x00002000 /* Compile (same as PCRE_NO_UTF16_CHECK) */
#define PCRE_NO_UTF16_CHECK 0x00002000 /* Compile (same as PCRE_NO_UTF8_CHECK) */
#define PCRE_AUTO_CALLOUT 0x00004000 /* Compile */
#define PCRE_PARTIAL_SOFT 0x00008000 /* Exec, DFA exec */
#define PCRE_PARTIAL     0x00008000 /* Backwards compatible synonym */
#define PCRE_DFA_SHORTEST 0x00010000 /* DFA exec */
#define PCRE_DFA_RESTART 0x00020000 /* DFA exec */
#define PCRE_FIRSTLINE   0x00040000 /* Compile, used in exec, DFA exec */
#define PCRE_DUPNAMES    0x00080000 /* Compile */
#define PCRE_NEWLINE_CR  0x00100000 /* Compile, exec, DFA exec */
#define PCRE_NEWLINE_LF  0x00200000 /* Compile, exec, DFA exec */
#define PCRE_NEWLINE_CRLF 0x00300000 /* Compile, exec, DFA exec */
#define PCRE_NEWLINE_ANY 0x00400000 /* Compile, exec, DFA exec */
#define PCRE_NEWLINE_ANYCRLF 0x00500000 /* Compile, exec, DFA exec */
#define PCRE_BSR_ANYCRLF 0x00800000 /* Compile, exec, DFA exec */
#define PCRE_BSR_UNICODE 0x01000000 /* Compile, exec, DFA exec */
#define PCRE_JAVASCRIPT_COMPAT 0x02000000 /* Compile, used in exec */
#define PCRE_NO_START_OPTIMIZE 0x04000000 /* Compile, exec, DFA exec */
#define PCRE_NO_START_OPTIMISE 0x04000000 /* Synonym */
#define PCRE_PARTIAL_HARD 0x08000000 /* Exec, DFA exec */
#define PCRE_NOTEMPTY_ATSTART 0x10000000 /* Exec, DFA exec */
#define PCRE_UCP         0x20000000 /* Compile, used in exec, DFA exec */

/* Exec-time and get/set-time error codes */

#define PCRE_ERROR_NOMATCH (-1)
#define PCRE_ERROR_NULL (-2)
#define PCRE_ERROR_BADOPTION (-3)
```

```

#define PCRE_ERROR_BADMAGIC      (-4)
#define PCRE_ERROR_UNKNOWN_OPCODE (-5)
#define PCRE_ERROR_UNKNOWN_NODE  (-5) /* For backward compatibility */
#define PCRE_ERROR_NOMEMORY      (-6)
#define PCRE_ERROR_NOSUBSTRING   (-7)
#define PCRE_ERROR_MATCHLIMIT    (-8)
#define PCRE_ERROR_CALLOUT       (-9) /* Never used by PCRE itself */
#define PCRE_ERROR_BADUTF8       (-10) /* Same for 8/16 */
#define PCRE_ERROR_BADUTF16      (-10) /* Same for 8/16 */
#define PCRE_ERROR_BADUTF8_OFFSET (-11) /* Same for 8/16 */
#define PCRE_ERROR_BADUTF16_OFFSET (-11) /* Same for 8/16 */
#define PCRE_ERROR_PARTIAL       (-12)
#define PCRE_ERROR_BADPARTIAL    (-13)
#define PCRE_ERROR_INTERNAL      (-14)
#define PCRE_ERROR_BADCOUNT     (-15)
#define PCRE_ERROR_DFA_UITEM     (-16)
#define PCRE_ERROR_DFA_UCOND     (-17)
#define PCRE_ERROR_DFA_UMLIMIT   (-18)
#define PCRE_ERROR_DFA_WSSIZE    (-19)
#define PCRE_ERROR_DFA_RECURSE  (-20)
#define PCRE_ERROR_RECURSIONLIMIT (-21)
#define PCRE_ERROR_NULLWSLIMIT   (-22) /* No longer actually used */
#define PCRE_ERROR_BADNEWLINE    (-23)
#define PCRE_ERROR_BADOFFSET     (-24)
#define PCRE_ERROR_SHORTUTF8     (-25)
#define PCRE_ERROR_SHORTUTF16    (-25) /* Same for 8/16 */
#define PCRE_ERROR_RECURSELOOP  (-26)
#define PCRE_ERROR_JIT_STACKLIMIT (-27)
#define PCRE_ERROR_BADMODE       (-28)
#define PCRE_ERROR_BADENDIANNESS (-29)
#define PCRE_ERROR_DFA_BADRESTART (-30)

```

/* Specific error codes for UTF-8 validity checks */

```

#define PCRE_UTF8_ERR0      0
#define PCRE_UTF8_ERR1     1
#define PCRE_UTF8_ERR2     2
#define PCRE_UTF8_ERR3     3
#define PCRE_UTF8_ERR4     4
#define PCRE_UTF8_ERR5     5
#define PCRE_UTF8_ERR6     6
#define PCRE_UTF8_ERR7     7
#define PCRE_UTF8_ERR8     8
#define PCRE_UTF8_ERR9     9
#define PCRE_UTF8_ERR10    10
#define PCRE_UTF8_ERR11    11
#define PCRE_UTF8_ERR12    12
#define PCRE_UTF8_ERR13    13

```

```

#define PCRE_UTF8_ERR14      14
#define PCRE_UTF8_ERR15      15
#define PCRE_UTF8_ERR16      16
#define PCRE_UTF8_ERR17      17
#define PCRE_UTF8_ERR18      18
#define PCRE_UTF8_ERR19      19
#define PCRE_UTF8_ERR20      20
#define PCRE_UTF8_ERR21      21

/* Specific error codes for UTF-16 validity checks */

#define PCRE_UTF16_ERR0       0
#define PCRE_UTF16_ERR1       1
#define PCRE_UTF16_ERR2       2
#define PCRE_UTF16_ERR3       3
#define PCRE_UTF16_ERR4       4

/* Request types for pcre_fullinfo() */

#define PCRE_INFO_OPTIONS      0
#define PCRE_INFO_SIZE         1
#define PCRE_INFO_CAPTURECOUNT  2
#define PCRE_INFO_BACKREFMAX    3
#define PCRE_INFO_FIRSTBYTE     4
#define PCRE_INFO_FIRSTCHAR     4 /* For backwards compatibility */
#define PCRE_INFO_FIRSTTABLE    5
#define PCRE_INFO_LASTLITERAL   6
#define PCRE_INFO_NAMEENTRYSIZE  7
#define PCRE_INFO_NAMECOUNT    8
#define PCRE_INFO_NAMETABLE     9
#define PCRE_INFO_STUDYSIZE     10
#define PCRE_INFO_DEFAULT_TABLES 11
#define PCRE_INFO_OKPARTIAL     12
#define PCRE_INFO_JCHANGED      13
#define PCRE_INFO_HASCORRLF     14
#define PCRE_INFO_MINLENGTH     15
#define PCRE_INFO_JIT           16
#define PCRE_INFO_JITSIZE       17
#define PCRE_INFO_MAXLOOKBEHIND 18

/* Request types for pcre_config(). Do not re-arrange, in order to remain
compatible. */

#define PCRE_CONFIG_UTF8        0
#define PCRE_CONFIG_NEWLINE     1
#define PCRE_CONFIG_LINK_SIZE   2
#define PCRE_CONFIG_POSIX_MALLOC_THRESHOLD 3
#define PCRE_CONFIG_MATCH_LIMIT 4

```



```

#define PCRE_CONFIG_STACKRECURSE      5
#define PCRE_CONFIG_UNICODE_PROPERTIES 6
#define PCRE_CONFIG_MATCH_LIMIT_RECURSION 7
#define PCRE_CONFIG_BSR                8
#define PCRE_CONFIG_JIT                9
#define PCRE_CONFIG_UTF16              10
#define PCRE_CONFIG_JITTARGET          11

/* Request types for pcre_study(). Do not re-arrange, in order to remain
compatible. */

#define PCRE_STUDY_JIT_COMPILE          0x0001
#define PCRE_STUDY_JIT_PARTIAL_SOFT_COMPILE 0x0002
#define PCRE_STUDY_JIT_PARTIAL_HARD_COMPILE 0x0004

/* Bit flags for the pcre[16]_extra structure. Do not re-arrange or redefine
these bits, just add new ones on the end, in order to remain compatible. */

#define PCRE_EXTRA_STUDY_DATA          0x0001
#define PCRE_EXTRA_MATCH_LIMIT         0x0002
#define PCRE_EXTRA_CALLOUT_DATA       0x0004
#define PCRE_EXTRA_TABLES              0x0008
#define PCRE_EXTRA_MATCH_LIMIT_RECURSION 0x0010
#define PCRE_EXTRA_MARK                0x0020
#define PCRE_EXTRA_EXECUTABLE_JIT     0x0040

/* Types */

struct real_pcre;          /* declaration; the definition is private */
typedef struct real_pcre pcre;

struct real_pcre16;       /* declaration; the definition is private */
typedef struct real_pcre16 pcre16;

struct real_pcre_jit_stack; /* declaration; the definition is private */
typedef struct real_pcre_jit_stack pcre_jit_stack;

struct real_pcre16_jit_stack; /* declaration; the definition is private */
typedef struct real_pcre16_jit_stack pcre16_jit_stack;

/* If PCRE is compiled with 16 bit character support, PCRE_UCHAR16 must contain
a 16 bit wide signed data type. Otherwise it can be a dummy data type since
pcre16 functions are not implemented. There is a check for this in pcre_internal.h. */
#ifndef PCRE_UCHAR16
#define PCRE_UCHAR16 unsigned short
#endif

#ifndef PCRE_SPTR16

```

```

#define PCRE_SPTR16 const PCRE_UCHAR16 *
#endif

/* When PCRE is compiled as a C++ library, the subject pointer type can be
replaced with a custom type. For conventional use, the public interface is a
const char *. */

#ifndef PCRE_SPTR
#define PCRE_SPTR const char *
#endif

/* The structure for passing additional data to pcre_exec(). This is defined in
such a way as to be extensible. Always add new fields at the end, in order to
remain compatible. */

typedef struct pcre_extra {
  unsigned long int flags;      /* Bits for which fields are set */
  void *study_data;           /* Opaque data from pcre_study() */
  unsigned long int match_limit; /* Maximum number of calls to match() */
  void *callout_data;         /* Data passed back in callouts */
  const unsigned char *tables; /* Pointer to character tables */
  unsigned long int match_limit_recursion; /* Max recursive calls to match() */
  unsigned char **mark;        /* For passing back a mark pointer */
  void *executable_jit;        /* Contains a pointer to a compiled jit code */
} pcre_extra;

/* Same structure as above, but with 16 bit char pointers. */

typedef struct pcre16_extra {
  unsigned long int flags;      /* Bits for which fields are set */
  void *study_data;           /* Opaque data from pcre_study() */
  unsigned long int match_limit; /* Maximum number of calls to match() */
  void *callout_data;         /* Data passed back in callouts */
  const unsigned char *tables; /* Pointer to character tables */
  unsigned long int match_limit_recursion; /* Max recursive calls to match() */
  PCRE_UCHAR16 **mark;        /* For passing back a mark pointer */
  void *executable_jit;        /* Contains a pointer to a compiled jit code */
} pcre16_extra;

/* The structure for passing out data via the pcre_callout_function. We use a
structure so that new fields can be added on the end in future versions,
without changing the API of the function, thereby allowing old clients to work
without modification. */

typedef struct pcre_callout_block {
  int version;                /* Identifies version of block */
  /* ----- Version 0 ----- */
  int callout_number;         /* Number compiled into pattern */

```

```

int     *offset_vector; /* The offset vector */
PCRE_SPTR  subject;    /* The subject being matched */
int     subject_length; /* The length of the subject */
int     start_match;   /* Offset to start of this match attempt */
int     current_position; /* Where we currently are in the subject */
int     capture_top;   /* Max current capture */
int     capture_last;  /* Most recently closed capture */
void     *callout_data; /* Data passed in with the call */
/* ----- Added for Version 1 ----- */
int     pattern_position; /* Offset to next item in the pattern */
int     next_item_length; /* Length of next item in the pattern */
/* ----- Added for Version 2 ----- */
const unsigned char *mark; /* Pointer to current mark or NULL */
/* ----- */
} pcre_callout_block;

/* Same structure as above, but with 16 bit char pointers. */

typedef struct pcre16_callout_block {
int     version;      /* Identifies version of block */
/* ----- Version 0 ----- */
int     callout_number; /* Number compiled into pattern */
int     *offset_vector; /* The offset vector */
PCRE_SPTR16  subject; /* The subject being matched */
int     subject_length; /* The length of the subject */
int     start_match;   /* Offset to start of this match attempt */
int     current_position; /* Where we currently are in the subject */
int     capture_top;   /* Max current capture */
int     capture_last;  /* Most recently closed capture */
void     *callout_data; /* Data passed in with the call */
/* ----- Added for Version 1 ----- */
int     pattern_position; /* Offset to next item in the pattern */
int     next_item_length; /* Length of next item in the pattern */
/* ----- Added for Version 2 ----- */
const PCRE_UCHAR16 *mark; /* Pointer to current mark or NULL */
/* ----- */
} pcre16_callout_block;

/* Indirection for store get and free functions. These can be set to
alternative malloc/free functions if required. Special ones are used in the
non-recursive case for "frames". There is also an optional callout function
that is triggered by the (?) regex item. For Virtual Pascal, these definitions
have to take another form. */

#ifdef VPCOMPAT
PCRE_EXP_DECL void (*pcre_malloc)(size_t);
PCRE_EXP_DECL void (*pcre_free)(void *);
PCRE_EXP_DECL void (*pcre_stack_malloc)(size_t);

```

```

PCRE_EXP_DECL void (*pcre_stack_free)(void *);
PCRE_EXP_DECL int (*pcre_callout)(pcre_callout_block *);

PCRE_EXP_DECL void (*pcre16_malloc)(size_t);
PCRE_EXP_DECL void (*pcre16_free)(void *);
PCRE_EXP_DECL void (*pcre16_stack_malloc)(size_t);
PCRE_EXP_DECL void (*pcre16_stack_free)(void *);
PCRE_EXP_DECL int (*pcre16_callout)(pcre16_callout_block *);
#else /* VPCOMPAT */
PCRE_EXP_DECL void *pcre_malloc(size_t);
PCRE_EXP_DECL void pcre_free(void *);
PCRE_EXP_DECL void *pcre_stack_malloc(size_t);
PCRE_EXP_DECL void pcre_stack_free(void *);
PCRE_EXP_DECL int pcre_callout(pcre_callout_block *);

PCRE_EXP_DECL void *pcre16_malloc(size_t);
PCRE_EXP_DECL void pcre16_free(void *);
PCRE_EXP_DECL void *pcre16_stack_malloc(size_t);
PCRE_EXP_DECL void pcre16_stack_free(void *);
PCRE_EXP_DECL int pcre16_callout(pcre16_callout_block *);
#endif /* VPCOMPAT */

/* User defined callback which provides a stack just before the match starts. */

typedef pcre_jit_stack (*pcre_jit_callback)(void *);
typedef pcre16_jit_stack (*pcre16_jit_callback)(void *);

/* Exported PCRE functions */

PCRE_EXP_DECL pcre *pcre_compile(const char *, int, const char **, int *,
    const unsigned char *);
PCRE_EXP_DECL pcre16 *pcre16_compile(PCRE_SPTR16, int, const char **, int *,
    const unsigned char *);
PCRE_EXP_DECL pcre *pcre_compile2(const char *, int, int *, const char **,
    int *, const unsigned char *);
PCRE_EXP_DECL pcre16 *pcre16_compile2(PCRE_SPTR16, int, int *, const char **,
    int *, const unsigned char *);
PCRE_EXP_DECL int pcre_config(int, void *);
PCRE_EXP_DECL int pcre16_config(int, void *);
PCRE_EXP_DECL int pcre_copy_named_substring(const pcre *, const char *,
    int *, int, const char *, char *, int);
PCRE_EXP_DECL int pcre16_copy_named_substring(const pcre16 *, PCRE_SPTR16,
    int *, int, PCRE_SPTR16, PCRE_UCHAR16 *, int);
PCRE_EXP_DECL int pcre_copy_substring(const char *, int *, int, int,
    char *, int);
PCRE_EXP_DECL int pcre16_copy_substring(PCRE_SPTR16, int *, int, int,
    PCRE_UCHAR16 *, int);
PCRE_EXP_DECL int pcre_dfa_exec(const pcre *, const pcre_extra *,

```

```

    const char *, int, int, int, int *, int *, int *, int);
PCRE_EXP_DECL int pcre16_dfa_exec(const pcre16 *, const pcre16_extra *,
    PCRE_SPTR16, int, int, int, int *, int *, int *, int);
PCRE_EXP_DECL int pcre_exec(const pcre *, const pcre_extra *, PCRE_SPTR,
    int, int, int, int *, int);
PCRE_EXP_DECL int pcre16_exec(const pcre16 *, const pcre16_extra *,
    PCRE_SPTR16, int, int, int, int *, int);
PCRE_EXP_DECL void pcre_free_substring(const char *);
PCRE_EXP_DECL void pcre16_free_substring(PCRE_SPTR16);
PCRE_EXP_DECL void pcre_free_substring_list(const char **);
PCRE_EXP_DECL void pcre16_free_substring_list(PCRE_SPTR16 *);
PCRE_EXP_DECL int pcre_fullinfo(const pcre *, const pcre_extra *, int,
    void *);
PCRE_EXP_DECL int pcre16_fullinfo(const pcre16 *, const pcre16_extra *, int,
    void *);
PCRE_EXP_DECL int pcre_get_named_substring(const pcre *, const char *,
    int *, int, const char *, const char **);
PCRE_EXP_DECL int pcre16_get_named_substring(const pcre16 *, PCRE_SPTR16,
    int *, int, PCRE_SPTR16, PCRE_SPTR16 *);
PCRE_EXP_DECL int pcre_get_stringnumber(const pcre *, const char *);
PCRE_EXP_DECL int pcre16_get_stringnumber(const pcre16 *, PCRE_SPTR16);
PCRE_EXP_DECL int pcre_get_stringtable_entries(const pcre *, const char *,
    char **, char **);
PCRE_EXP_DECL int pcre16_get_stringtable_entries(const pcre16 *, PCRE_SPTR16,
    PCRE_UCHAR16 **, PCRE_UCHAR16 **);
PCRE_EXP_DECL int pcre_get_substring(const char *, int *, int, int,
    const char **);
PCRE_EXP_DECL int pcre16_get_substring(PCRE_SPTR16, int *, int, int,
    PCRE_SPTR16 *);
PCRE_EXP_DECL int pcre_get_substring_list(const char *, int *, int,
    const char ***);
PCRE_EXP_DECL int pcre16_get_substring_list(PCRE_SPTR16, int *, int,
    PCRE_SPTR16 **);
PCRE_EXP_DECL const unsigned char *pcre_maketables(void);
PCRE_EXP_DECL const unsigned char *pcre16_maketables(void);
PCRE_EXP_DECL int pcre_refcount(pcre *, int);
PCRE_EXP_DECL int pcre16_refcount(pcre16 *, int);
PCRE_EXP_DECL pcre_extra *pcre_study(const pcre *, int, const char **);
PCRE_EXP_DECL pcre16_extra *pcre16_study(const pcre16 *, int, const char **);
PCRE_EXP_DECL void pcre_free_study(pcre_extra *);
PCRE_EXP_DECL void pcre16_free_study(pcre16_extra *);
PCRE_EXP_DECL const char *pcre_version(void);
PCRE_EXP_DECL const char *pcre16_version(void);

/* Utility functions for byte order swaps. */
PCRE_EXP_DECL int pcre_pattern_to_host_byte_order(pcre *, pcre_extra *,
    const unsigned char *);
PCRE_EXP_DECL int pcre16_pattern_to_host_byte_order(pcre16 *, pcre16_extra *,

```

```

        const unsigned char *);
PCRE_EXP_DECL int pcre16_utf16_to_host_byte_order(PCRE_UCHAR16 *,
        PCRE_SPTR16, int, int *, int);

/* JIT compiler related functions. */

PCRE_EXP_DECL pcre_jit_stack *pcre_jit_stack_alloc(int, int);
PCRE_EXP_DECL pcre16_jit_stack *pcre16_jit_stack_alloc(int, int);
PCRE_EXP_DECL void pcre_jit_stack_free(pcre_jit_stack *);
PCRE_EXP_DECL void pcre16_jit_stack_free(pcre16_jit_stack *);
PCRE_EXP_DECL void pcre_assign_jit_stack(pcre_extra *,
        pcre_jit_callback, void *);
PCRE_EXP_DECL void pcre16_assign_jit_stack(pcre16_extra *,
        pcre16_jit_callback, void *);

#ifdef __cplusplus
} /* extern "C" */
#endif

#endif /* End of pcre.h */

/* GLIB - Library of useful routines for C programming
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/*
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 * files for a list of changes. These files are distributed with
 * GLib at ftp://ftp.gtk.org/pub/gtk/.
 */

#ifdef __G_LIB_H__
#define __G_LIB_H__

#define __GLIB_H_INSIDE__

```

```
#include <glib/galloca.h>
#include <glib/garray.h>
#include <glib/gasyncqueue.h>
#include <glib/gatomic.h>
#include <glib/gbacktrace.h>
#include <glib/gbase64.h>
#include <glib/gbitlock.h>
#include <glib/gbookmarkfile.h>
#include <glib/gbytes.h>
#include <glib/gcharset.h>
#include <glib/gchecksum.h>
#include <glib/gconvert.h>
#include <glib/gdataset.h>
#include <glib/gdate.h>
#include <glib/gdatettime.h>
#include <glib/gdir.h>
#include <glib/genviron.h>
#include <glib/gerror.h>
#include <glib/gfileutils.h>
#include <glib/ggettext.h>
#include <glib/ghash.h>
#include <glib/ghmac.h>
#include <glib/ghook.h>
#include <glib/ghostutils.h>
#include <glib/giochannel.h>
#include <glib/gkeyfile.h>
#include <glib/glist.h>
#include <glib/gmacros.h>
#include <glib/gmain.h>
#include <glib/gmappedfile.h>
#include <glib/gmarkup.h>
#include <glib/gmem.h>
#include <glib/gmessages.h>
#include <glib/gnode.h>
#include <glib/goption.h>
#include <glib/gpattern.h>
#include <glib/gpoll.h>
#include <glib/gprimes.h>
#include <glib/gqsort.h>
#include <glib/gquark.h>
#include <glib/gqueue.h>
#include <glib/grand.h>
#include <glib/gregex.h>
#include <glib/gscanner.h>
#include <glib/gsequence.h>
#include <glib/gshell.h>
#include <glib/gslice.h>
```

```

#include <glib/gslist.h>
#include <glib/gspawn.h>
#include <glib/gstrfuncs.h>
#include <glib/gstring.h>
#include <glib/gstringchunk.h>
#include <glib/gtestutils.h>
#include <glib/gthread.h>
#include <glib/gthreadpool.h>
#include <glib/gtimer.h>
#include <glib/gtimezone.h>
#include <glib/gtrashstack.h>
#include <glib/gtree.h>
#include <glib/gtypes.h>
#include <glib/gunicode.h>
#include <glib/gurifuncs.h>
#include <glib/gutils.h>
#include <glib/gvarianttype.h>
#include <glib/gvariant.h>
#include <glib/gversion.h>
#include <glib/gversionmacros.h>
#ifdef G_PLATFORM_WIN32
#include <glib/gwin32.h>
#endif

#ifndef G_DISABLE_DEPRECATED
#include <glib/deprecated/gallocator.h>
#include <glib/deprecated/gcache.h>
#include <glib/deprecated/gcompletion.h>
#include <glib/deprecated/gmain.h>
#include <glib/deprecated/grel.h>
#include <glib/deprecated/gthread.h>
#endif /* G_DISABLE_DEPRECATED */

#include <glib/glib-autocleanups.h>

#undef __GLIB_H_INSIDE__

#endif /* __G_LIB_H__ */

```

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1.59 tensorflow-lite 2.5.0

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For the org.apache.hadoop.util.bloom.* classes:

```
/**
 *
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 * LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN
 * ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE
 * POSSIBILITY OF SUCH DAMAGE.
 */
```

For portions of the native implementation of slicing-by-8 CRC calculation
in src/main/native/src/org/apache/hadoop/util:

```
/**
 * Copyright 2008,2009,2010 Massachusetts Institute of Technology.
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 * BSD-style license that can be found in the LICENSE file.
 */
```

For src/main/native/src/org/apache/hadoop/io/compress/lz4/lz4.c:

```
/*
LZ4 - Fast LZ compression algorithm
Copyright (C) 2011, Yann Collet.
BSD License
```

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```
*/
path: "tensorflow.errors.PermissionDeniedError"
tf_class {
  is_instance: "<class \'tensorflow.python.framework.errors_impl.PermissionDeniedError\'>"
  is_instance: "<class \'tensorflow.python.framework.errors_impl.OpError\'>"
  is_instance: "<type \'exceptions.Exception\'>"
  member {
    name: "args"
    mtype: "<type \'getset_descriptor\'>"
  }
  member {
    name: "error_code"
```

```

    mtype: "<type \'property\>"
  }
  member {
    name: "experimental_payloads"
    mtype: "<type \'property\>"
  }
  member {
    name: "message"
    mtype: "<type \'property\>"
  }
  member {
    name: "node_def"
    mtype: "<type \'property\>"
  }
  member {
    name: "op"
    mtype: "<type \'property\>"
  }
  member_method {
    name: "__init__"
    argspec: "args=[\'self\', \'node_def\', \'op\', \'message\'], varargs=args, keywords=None, defaults=None"
  }
}

```

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For example, with most compilers, you could add this to your project

```
CXXFLAGS: -DEIGEN_MPL2_ONLY
```

This will cause a compilation error to be generated if you #include any code that is LGPL licensed.

Following applies to:

```
./test/mapstaticmethods.cpp  
./test/schur_real.cpp  
./test/prec_inverse_4x4.cpp  
./test/smallvectors.cpp  
./test/redux.cpp  
./test/special_numbers.cpp  
./test/adjoint.cpp  
./test/resize.cpp  
./test/mixingtypes.cpp  
./test/product_trmv.cpp  
./test/sparse_solvers.cpp  
./test/cholesky.cpp  
./test/geo_quaternion.cpp  
./test/miscmatrices.cpp  
./test/stddeque.cpp  
./test/integer_types.cpp  
./test/product_large.cpp  
./test/eigensolver_generic.cpp  
./test/householder.cpp  
./test/geo_orthomethods.cpp  
./test/array_for_matrix.cpp  
./test/sparseLM.cpp  
./test/upperbidiagonalization.cpp  
./test/nomalloc.cpp  
./test/packetmath.cpp  
./test/jacobisvd.cpp  
./test/geo_transformations.cpp  
./test/swap.cpp  
./test/eigensolver_selfadjoint.cpp  
./test/inverse.cpp  
./test/product_selfadjoint.cpp  
./test/product_trsolve.cpp  
./test/product_extra.cpp  
./test/sparse_solver.h  
./test/mapstride.cpp  
./test/mapped_matrix.cpp  
./test/geo_eulerangles.cpp  
./test/eigen2support.cpp  
./test/denseLM.cpp  
./test/stdvector.cpp  
./test/nesting_ops.cpp
```

./test/sparse_permutations.cpp
./test/zerosized.cpp
./test/exceptions.cpp
./test/vectorwiseop.cpp
./test/cwiseop.cpp
./test/basicstuff.cpp
./test/product_trmm.cpp
./test/linearstructure.cpp
./test/sparse_product.cpp
./test/stdvector_overload.cpp
./test/stable_norm.cpp
./test/umeyama.cpp
./test/unalignedcount.cpp
./test/triangular.cpp
./test/product_mmtr.cpp
./test/sparse_basic.cpp
./test/sparse_vector.cpp
./test/meta.cpp
./test/real_qz.cpp
./test/ref.cpp
./test/eigensolver_complex.cpp
./test/cholmod_support.cpp
./test/conjugate_gradient.cpp
./test/sparse.h
./test/simplicial_cholesky.cpp
./test/bicgstab.cpp
./test/dynalloc.cpp
./test/product_notemporary.cpp
./test/geo_hyperplane.cpp
./test/lu.cpp
./test/qr.cpp
./test/hessenberg.cpp
./test/sizeof.cpp
./test/main.h
./test/selfadjoint.cpp
./test/permutationmatrices.cpp
./test/superlu_support.cpp
./test/qtvector.cpp
./test/geo_homogeneous.cpp
./test/determinant.cpp
./test/array_reverse.cpp
./test/unalignedassert.cpp
./test/stdlist.cpp
./test/product_symm.cpp
./test/corners.cpp
./test/dontalign.cpp
./test/visitor.cpp
./test/geo_alignedbox.cpp

./test/diagonalmatrices.cpp
./test/product_small.cpp
./test/eigensolver_generalized_real.cpp
./test/umfpack_support.cpp
./test/first_aligned.cpp
./test/qr_fullpivoting.cpp
./test/array_replicate.cpp
./test/geo_parametrizedline.cpp
./test/eigen2/eigen2_unalignedassert.cpp
./test/eigen2/eigen2_prec_inverse_4x4.cpp
./test/eigen2/eigen2_alignedbox.cpp
./test/eigen2/eigen2_sparse_product.cpp
./test/eigen2/eigen2_meta.cpp
./test/eigen2/eigen2_nomalloc.cpp
./test/eigen2/eigen2_visitor.cpp
./test/eigen2/eigen2_packetmath.cpp
./test/eigen2/eigen2_svd.cpp
./test/eigen2/eigen2_mixingtypes.cpp
./test/eigen2/eigen2_qr.cpp
./test/eigen2/eigen2_cwiseop.cpp
./test/eigen2/eigen2_geometry_with_eigen2_prefix.cpp
./test/eigen2/eigen2_smallvectors.cpp
./test/eigen2/eigen2_commainitializer.cpp
./test/eigen2/eigen2_sparse_solvers.cpp
./test/eigen2/eigen2_hyperplane.cpp
./test/eigen2/eigen2_eigensolver.cpp
./test/eigen2/eigen2_linearstructure.cpp
./test/eigen2/eigen2_sizeof.cpp
./test/eigen2/eigen2_parametrizedline.cpp
./test/eigen2/eigen2_lu.cpp
./test/eigen2/eigen2_adjoint.cpp
./test/eigen2/eigen2_geometry.cpp
./test/eigen2/eigen2_stdvector.cpp
./test/eigen2/eigen2_newstdvector.cpp
./test/eigen2/eigen2_submatrices.cpp
./test/eigen2/sparse.h
./test/eigen2/eigen2_swap.cpp
./test/eigen2/eigen2_triangular.cpp
./test/eigen2/eigen2_basicstuff.cpp
./test/eigen2/gsl_helper.h
./test/eigen2/eigen2_dynalloc.cpp
./test/eigen2/eigen2_array.cpp
./test/eigen2/eigen2_map.cpp
./test/eigen2/main.h
./test/eigen2/eigen2_miscmatrices.cpp
./test/eigen2/eigen2_product_large.cpp
./test/eigen2/eigen2_first_aligned.cpp
./test/eigen2/eigen2_cholesky.cpp

./test/eigen2/eigen2_determinant.cpp
./test/eigen2/eigen2_sum.cpp
./test/eigen2/eigen2_inverse.cpp
./test/eigen2/eigen2_regression.cpp
./test/eigen2/eigen2_product_small.cpp
./test/eigen2/eigen2_qtvector.cpp
./test/eigen2/eigen2_sparse_vector.cpp
./test/eigen2/product.h
./test/eigen2/eigen2_sparse_basic.cpp
./test/eigen2/eigen2_bug_132.cpp
./test/array.cpp
./test/product_syrk.cpp
./test/commainitializer.cpp
./test/conservative_resize.cpp
./test/qr_colpivoting.cpp
./test/nullary.cpp
./test/bandmatrix.cpp
./test/pastix_support.cpp
./test/product.h
./test/block.cpp
./test/vectorization_logic.cpp
./test/jacobi.cpp
./test/diagonal.cpp
./test/schur_complex.cpp
./test/sizeoverflow.cpp
./bench/BenchTimer.h
./bench/benchFFT.cpp
./bench/eig33.cpp
./bench/spbench/spbenchsolver.h
./bench/spbench/spbenchstyle.h
./lapack/complex_double.cpp
./lapack/cholesky.cpp
./lapack/lapack_common.h
./lapack/eigenvalues.cpp
./lapack/single.cpp
./lapack/lu.cpp
./lapack/complex_single.cpp
./lapack/double.cpp
./demos/mix_eigen_and_c/binary_library.cpp
./demos/mix_eigen_and_c/binary_library.h
./demos/mix_eigen_and_c/example.c
./demos/mandelbrot/mandelbrot.cpp
./demos/mandelbrot/mandelbrot.h
./demos/opengl/icosphere.cpp
./demos/opengl/icosphere.h
./demos/opengl/camera.cpp
./demos/opengl/quaternion_demo.h
./demos/opengl/camera.h

./demos/opengl/trackball.h
./demos/opengl/gpuhelper.h
./demos/opengl/trackball.cpp
./demos/opengl/gpuhelper.cpp
./demos/opengl/quaternion_demo.cpp
./debug/gdb/printers.py
./unsupported/test/minres.cpp
./unsupported/test/openglsupport.cpp
./unsupported/test/jacobisvd.cpp
./unsupported/test/dgmres.cpp
./unsupported/test/matrix_square_root.cpp
./unsupported/test/bdcsvd.cpp
./unsupported/test/matrix_exponential.cpp
./unsupported/test/forward_adolc.cpp
./unsupported/test/polynomialsolver.cpp
./unsupported/test/matrix_function.cpp
./unsupported/test/sparse_extra.cpp
./unsupported/test/matrix_functions.h
./unsupported/test/svd_common.h
./unsupported/test/FFTW.cpp
./unsupported/test/alignedvector3.cpp
./unsupported/test/autodiff.cpp
./unsupported/test/gmres.cpp
./unsupported/test/BVH.cpp
./unsupported/test/levenberg_marquardt.cpp
./unsupported/test/matrix_power.cpp
./unsupported/test/kronecker_product.cpp
./unsupported/test/splines.cpp
./unsupported/test/polynomialutils.cpp
./unsupported/bench/bench_svd.cpp
./unsupported/Eigen/IterativeSolvers
./unsupported/Eigen/src/IterativeSolvers/DGMRES.h
./unsupported/Eigen/src/IterativeSolvers/IncompleteLU.h
./unsupported/Eigen/src/IterativeSolvers/GMRES.h
./unsupported/Eigen/src/IterativeSolvers/IncompleteCholesky.h
./unsupported/Eigen/src/IterativeSolvers/Scaling.h
./unsupported/Eigen/src/IterativeSolvers/MINRES.h
./unsupported/Eigen/src/SparseExtra/RandomSetter.h
./unsupported/Eigen/src/SparseExtra/MatrixMarketIterator.h
./unsupported/Eigen/src/SparseExtra/DynamicSparseMatrix.h
./unsupported/Eigen/src/SparseExtra/MarketIO.h
./unsupported/Eigen/src/SparseExtra/BlockOfDynamicSparseMatrix.h
./unsupported/Eigen/src/KroneckerProduct/KroneckerTensorProduct.h
./unsupported/Eigen/src/NonLinearOptimization/LevenbergMarquardt.h
./unsupported/Eigen/src/NonLinearOptimization/HybridNonLinearSolver.h
./unsupported/Eigen/src/BVH/BVAlgorithms.h
./unsupported/Eigen/src/BVH/KdBVH.h
./unsupported/Eigen/src/AutoDiff/AutoDiffScalar.h

./unsupported/Eigen/src/AutoDiff/AutoDiffJacobian.h
./unsupported/Eigen/src/AutoDiff/AutoDiffVector.h
./unsupported/Eigen/src/Splines/Spline.h
./unsupported/Eigen/src/Splines/SplineFitting.h
./unsupported/Eigen/src/Splines/SplineFwd.h
./unsupported/Eigen/src/SVD/JacobiSVD.h
./unsupported/Eigen/src/SVD/BDCSVD.h
./unsupported/Eigen/src/SVD/SVDBase.h
./unsupported/Eigen/src/MatrixFunctions/MatrixFunction.h
./unsupported/Eigen/src/MatrixFunctions/MatrixSquareRoot.h
./unsupported/Eigen/src/MatrixFunctions/MatrixLogarithm.h
./unsupported/Eigen/src/MatrixFunctions/StemFunction.h
./unsupported/Eigen/src/MatrixFunctions/MatrixPower.h
./unsupported/Eigen/src/MatrixFunctions/MatrixExponential.h
./unsupported/Eigen/src/MatrixFunctions/MatrixFunctionAtomic.h
./unsupported/Eigen/src/MoreVectorization/MathFunctions.h
./unsupported/Eigen/src/LevenbergMarquardt/LevenbergMarquardt.h
./unsupported/Eigen/src/FFT/ei_fftw_impl.h
./unsupported/Eigen/src/FFT/ei_kissfft_impl.h
./unsupported/Eigen/src/Polynomials/PolynomialSolver.h
./unsupported/Eigen/src/Polynomials/Companion.h
./unsupported/Eigen/src/Polynomials/PolynomialUtils.h
./unsupported/Eigen/src/NumericalDiff/NumericalDiff.h
./unsupported/Eigen/src/Skyline/SkylineProduct.h
./unsupported/Eigen/src/Skyline/SkylineMatrixBase.h
./unsupported/Eigen/src/Skyline/SkylineStorage.h
./unsupported/Eigen/src/Skyline/SkylineUtil.h
./unsupported/Eigen/src/Skyline/SkylineInplaceLU.h
./unsupported/Eigen/src/Skyline/SkylineMatrix.h
./unsupported/Eigen/SparseExtra
./unsupported/Eigen/AdolcForward
./unsupported/Eigen/KroneckerProduct
./unsupported/Eigen/NonLinearOptimization
./unsupported/Eigen/BVH
./unsupported/Eigen/OpenGLSupport
./unsupported/Eigen/ArpackSupport
./unsupported/Eigen/AutoDiff
./unsupported/Eigen/Splines
./unsupported/Eigen/MPRealSupport
./unsupported/Eigen/MatrixFunctions
./unsupported/Eigen/MoreVectorization
./unsupported/Eigen/LevenbergMarquardt
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./Eigen/Eigen2Support
./Eigen/src/Eigen2Support/VectorBlock.h
./Eigen/src/Eigen2Support/Cwise.h
./Eigen/src/Eigen2Support/Minor.h
./Eigen/src/Eigen2Support/Lazy.h
./Eigen/src/Eigen2Support/Memory.h
./Eigen/src/Eigen2Support/MathFunctions.h
./Eigen/src/Eigen2Support/Geometry/AlignedBox.h
./Eigen/src/Eigen2Support/Geometry/Hyperplane.h
./Eigen/src/Eigen2Support/Geometry/Quaternion.h
./Eigen/src/Eigen2Support/Geometry/Rotation2D.h
./Eigen/src/Eigen2Support/Geometry/ParametrizedLine.h
./Eigen/src/Eigen2Support/Geometry/RotationBase.h
./Eigen/src/Eigen2Support/Geometry/Translation.h
./Eigen/src/Eigen2Support/Geometry/Scaling.h
./Eigen/src/Eigen2Support/Geometry/AngleAxis.h
./Eigen/src/Eigen2Support/Geometry/Transform.h
./Eigen/src/Eigen2Support/TriangularSolver.h
./Eigen/src/Eigen2Support/LU.h
./Eigen/src/Eigen2Support/QR.h
./Eigen/src/Eigen2Support/SVD.h
./Eigen/src/Eigen2Support/Meta.h
./Eigen/src/Eigen2Support/Block.h
./Eigen/src/Eigen2Support/Macros.h
./Eigen/src/Eigen2Support/LeastSquares.h
./Eigen/src/Eigen2Support/CwiseOperators.h
./Eigen/src/Jacobi/Jacobi.h
./Eigen/src/misc/Kernel.h
./Eigen/src/misc/SparseSolve.h
./Eigen/src/misc/Solve.h
./Eigen/src/misc/Image.h
./Eigen/src/SparseCore/SparseColEtree.h
./Eigen/src/SparseCore/SparseTranspose.h
./Eigen/src/SparseCore/SparseUtil.h
./Eigen/src/SparseCore/SparseCwiseBinaryOp.h
./Eigen/src/SparseCore/SparseDiagonalProduct.h
./Eigen/src/SparseCore/SparseProduct.h
./Eigen/src/SparseCore/SparseDot.h
./Eigen/src/SparseCore/SparseCwiseUnaryOp.h
./Eigen/src/SparseCore/SparseSparseProductWithPruning.h
./Eigen/src/SparseCore/SparseBlock.h
./Eigen/src/SparseCore/SparseDenseProduct.h
./Eigen/src/SparseCore/CompressedStorage.h
./Eigen/src/SparseCore/SparseMatrixBase.h

`./Eigen/src/SparseCore/MappedSparseMatrix.h`
`./Eigen/src/SparseCore/SparseTriangularView.h`
`./Eigen/src/SparseCore/SparseView.h`
`./Eigen/src/SparseCore/SparseFuzzy.h`
`./Eigen/src/SparseCore/TriangularSolver.h`
`./Eigen/src/SparseCore/SparseSelfAdjointView.h`
`./Eigen/src/SparseCore/SparseMatrix.h`
`./Eigen/src/SparseCore/SparseVector.h`
`./Eigen/src/SparseCore/AmbiVector.h`
`./Eigen/src/SparseCore/ConservativeSparseSparseProduct.h`
`./Eigen/src/SparseCore/SparseRedux.h`
`./Eigen/src/SparseCore/SparsePermutation.h`
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1.61 linux-kernel 5.4.244

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/* nicstar.c v0.22 Jawaid Bazyar (bazyar@hypermall.com)

* nicstar.c, M. Welsh (matt.welsh@cl.cam.ac.uk)

*

* Hacked October, 1997 by Jawaid Bazyar, Interlink Advertising Services Inc.

* <http://www.hypermall.com/>

* 10/1/97 - commented out CFG_PHYIE bit - we don't care when the PHY

* interrupts us (except possibly for removal/insertion of the cable?)

* 10/4/97 - began heavy inline documentation of the code. Corrected typos

* and spelling mistakes.

* 10/5/97 - added code to handle PHY interrupts, disable PHY on

* loss of link, and correctly re-enable PHY when link is

* re-established. (put back CFG_PHYIE)

*

* Modified to work with the IDT7721 nicstar -- AAL5 (tested) only.

*

* R. D. Rechenmacher <ron@fnal.gov>, Aug. 6, 1997

*

* Linux driver for the IDT77201 NICStAR PCI ATM controller.

* PHY component is expected to be 155 Mbps S/UNI-Lite or IDT 77155;

* see init_nicstar() for PHY initialization to change this. This driver

* expects the Linux ATM stack to support scatter-gather lists

* (skb->atm.iovcnt != 0) for Rx skb's passed to vcc->push.

*

* Implementing minimal-copy of received data:

* IDT always receives data into a small buffer, then large buffers

* as needed. This means that data must always be copied to create

* the linear buffer needed by most non-ATM protocol stacks (e.g. IP)

* Fix is simple: make large buffers large enough to hold entire

* SDU, and leave <small_buffer_data> bytes empty at the start. Then

* copy small buffer contents to head of large buffer.

* Trick is to avoid fragmenting Linux, due to need for a lot of large

* buffers. This is done by 2 things:

* 1) skb->destructor / skb->atm.recycle_buffer

* combined, allow nicstar_free_rx_skb to be called to

* recycle large data buffers

* 2) skb_clone of received buffers

* See nicstar_free_rx_skb and linearize_buffer for implementation

* details.

*

*

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*
* M. Welsh, 6 July 1996
*
*
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1.62 nfs-utils 0.19

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1.63 numactl 2.0.11

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1.64 curl 7.86.0

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1.65 xfsprogs 2.8.16-1

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1.70 busybox 1.26.2

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@page

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This package was put together by Bruce Perens <Bruce@Pixar.com> from pre-distribution sources. Ian Murdock <imurdock@debian.org> integrated it into the base system maintained it until the end of 1995. Miquel van Smoorenburg <miquels@cistron.nl> has integrated debian support into the base package.

Changes:

29-January-1995 Bruce Perens <Bruce@Pixar.com>

Added Debian GNU/Linux package maintenance system files.

25-February-1995 Ian Murdock <imurdock@debian.org>

Finished integration of Sys V Init into the base system.

28-December-1995 Miquel van Smoorenburg <miquels@cistron.nl>

Added debian support to sysvinit.

For further changes see the ChangeLog file.

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*
* _____
*
* stdio.c
* by Mark Gates <mgates@nlanr.net>
* and Ajay Tirumalla <tirumala@ncsa.uiuc.edu>
* -----
* input and output numbers, converting with kilo, mega, giga
* ----- */

```

=====

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1.74 ethtool 5.12

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/*

* udevd.c - event listener and serializer

*

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1.80 futures 3.3.0

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1.81 curl 8.0.1

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1.82 setserial 2.17

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* /opt/cola/permits/1606678443_1679421531.3029604/0/matwey-setserial-2-17-0-ge4ab0db-1-tar-gz/matwey-setserial-e4ab0db/setserial.8.in

* /opt/cola/permits/1606678443_1679421531.3029604/0/matwey-setserial-2-17-0-ge4ab0db-1-tar-gz/matwey-setserial-e4ab0db/setserial.8

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/*

```
* version.h --- Defines the version number of setserial
*
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*/
```

Found in path(s):

```
* /opt/cola/permits/1606678443_1679421531.3029604/0/matwey-setserial-2-17-0-ge4ab0db-1-tar-gz/matwey-
setserial-e4ab0db/version.h
```

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```
/*
```

```
* include/linux/serial.h
```

```
*
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setserial-e4ab0db/linux/serial.h
```

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