1600、2000、2500、3000、AS5100 和 AS5200 的软件安装和升级过程

目录

简介

"本文解释如何使用普通文件传输协议(TFTP) 服务器或远程复制协议(RCP)服务器应用程序将Cisco IOS®软件安装到安装""从闪存运行的"" Cisco路由器上。"本示例基于Cisco 1600系列路由器，但适用于“已使用组件”部分中提及的所有平台。

注意：本文档中的信息基于Cisco IOS软件版本12.1及更高版本。

先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco 1600 系列路由器
- Cisco 2000 系列路由器
- Cisco 2500 系列路由器
- Cisco 3000 系列路由器
- 思科AS5100系列接入服务器
- 思科AS5200系列接入服务器

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

备份路由器或接入服务器配置

Cisco建议在升级Cisco IOS软件映像之前保留路由器/接入服务器配置的备份。

步骤 1：安装 TFTP 服务器

TFTP服务器或RCP服务器应用必须安装在TCP/IP就绪工作站或PC上。安装应用后，必须完成以下步骤来执行最低级别的配置：

1. 配置 TFTP 应用程序使其作为 TFTP 服务器运行，而不是作为 TFTP 客户端。
2. 指定出站文件目录。这是存储Cisco IOS软件映像的目录(请参见第2步)。 大多数TFTP应用程序提供安装例程序辅助这些配置任务。**注意：** 一定数量的TFTP或RCP应用程序可以从独立软件供应商获得，或者作为共享软件从万维网的公共源获得。

步骤 2：下载 Cisco IOS 软件镜像

从软件下载区将 Cisco IOS 软件镜像下载到您的工作站或 PC 上。

确保您下载的Cisco IOS软件映像同时支持您的硬件和所需的功能。您可以使用Cisco Software Advisor工具(仅限注册客户)验证硬件和功能支持。 您还必须检查动态RAM(DRAM)和闪存的内存要求，以确保路由器具有足够的DRAM和闪存来加载所选的Cisco IOS软件版本。有关为路由器选择正确的Cisco IOS软件版本的更多建议，请参阅如何选择Cisco IOS软件版本。

从闪存安装中运行

要从闪存安装运行，请完成以下步骤：

注意：对于RCP应用，请用RCP代替每次出现的TFTP。例如，用 copy rcp flash 命令代替 copy tftp flash 命令。

1. 建立一个控制台会话到路由器。即使可以通过Telnet会话连接路由器，我们仍强烈建议通过控制台端口直接连接路由器。理由是：如果在升级期间发生了某些故障，则可能需要在离路由器近一点，以便对它进行重启。此外，在升级过程中路由器重新启动时，您将失去telnet连接。使用反转电缆(通常浅黑电缆)将路由器的控制台端口连接到PC的COM端口上。
2. PC连接到路由器的控制台端口后，您需要在PC上打开超级终端，并使用以下设置：

```
Speed 9600 bits per second

8 databits

0 parity bits

1 stop bit
```

```
No Flow Control
```

注意：如果您在超级终端会话中收到任何垃圾字符，这意味着您尚未正确设置超级终端属性，或者路由器的配置寄存器设置为控制台连接速度高于9600 bps的非标准值。使用**show version**命令（显示在最后一行）检查配置寄存器的值，并确保其设置为0x2102或0x102。必须重新加载路由器以考虑此更改。一旦您确定路由器端的控制台速率为9600 bps ，您则应检查超级终端的属性是否按上述显示设置的。有关设置超级终端属性的详细信息，请参阅为控制台连接应用正确的终端仿真器设置。**Booting Problems** — 连接到路由器的控制台端口后，您可能会注意到路由器处于ROMmon或Boot模式。这两种模式用于恢复与诊断程序。如果您没有看到常见的路由器提示符，请使用这些建议以继续安装升级程序。路由器在rommon模式下启动，当您发出dir flash:指令：

```
rommon 1 > dir flash:
device does not contain a valid magic number
dir: cannot open device "flash:"
rommon 2 >
```

当您看到此错误消息时，这表示闪存为空或文件系统已损坏。有关如何对此问题进行故障排除的信息，请参阅使用ROMmon的Xmodem控制台下载过程。路由器在引导模式下启动，控制台上显示以下消息：

```
router(boot)>
device does not contain a valid magic number
boot: cannot open "flash:"
boot: cannot determine first file name on device "flash:"
```

当您在控制台输出中收到这些错误消息时，意味着闪存为空或文件系统已损坏。通过完成本文档中提供的步骤，在闪存上复制有效映像。

3. 配置路由器或接入服务器以引导到Rxboot模式。在这些平台上，Cisco IOS软件映像实际上直接从闪存运行。因此，如果您使用的是用户特权EXEC模式(Router #)，您就不能从TFTP服务器将Cisco IOS软件镜像复制到闪存上。 从此输出中，您可以看到闪存在用户特权EXEC模式下为只读。

```
Router#show flash:

PCMCIA flash directory:
File  Length    Name/status
  1   9615124   c1600-sy-l.122-7b.bin
[9615188 bytes used, 7162024 available, 16777212 total]
16384K bytes of processor board PCMCIA flash (Read ONLY)

Router#
```

您必须更改配置寄存器值，才能将路由器或接入服务器配置为引导到Rxboot模式。检查配置寄存器的当前值。您可以在show version命令输出的最后一**行中**看到它。它通常设置为0x2102或0x102。稍后，您需要此值。将配置寄存器更改为**0x2101**值。这将使路由器准备引导到RXboot模式：

```
Router>enable
Password: ! --- Enter the password here. Router# Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#config-register 0x2101
Router(config)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
!--- It is not necessary to save the configuration here, as the !--- configuration register
has already been changed in NVRAM. Router#reload
```

注意：如果通过Telnet连接，则重新加载后会丢失会话。请稍候片刻并重试。强烈建议您不要远程执行Cisco IOS软件升级，因为大多数灾难恢复程序需要您在路由器实际安装的地方。

4. 为下次重新加载恢复以前的配置寄存器值。**注意：**当路由器处于引导模式时，请勿保存配置。请避免使用save命令(**write memory**或**copy running-config startup-config**)，并对建议您保存当

前配置的任何提示**回答no**。如果在路由器处于此模式时保存配置，则可以部分或完全擦除配置。在以下命令中，将****替换为您在上一步中记录的配置寄存器值：

```
Router(boot)>
Router(boot)>enable
Password:
Router(boot)#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(boot)(config)#config-register 0x****
Router(boot)(config)#^Z
Router(boot)#
```

注意：如果您不记得之前设置的配置寄存器的值，则可以在此步骤中使用0x2102。

5. 验证TFTP服务器到路由器的连通性。TFTP 服务器和路由器之间必须有网络连接，且必须能 ping 出 TFTP 软件升级的目标路由器 IP 地址。要实现此目的，路由器接口和TFTP服务器必须具备：同范围的IP地址，或者配置了默认网关。
6. 将新软件Cisco IOS软件映像从TFTP服务器复制到路由器或接入服务器。现在您已经拥有IP连接性，并且能在充当TFTP服务器的计算机和路由器之间ping通，可以将Cisco IOS软件镜像复制到闪存中。**注意：**在复制之前，请确保在PC上启动了TFTP服务器软件，并且TFTP服务器根目录中提到了文件名。思科建议在升级之前保留路由器或接入服务器配置的备份。升级本身不影响配置(存储在非易失性RAM(NVRAM)中)。 但是，如果没有正确执行操作步骤，则可能会产生影响。对于RCP应用程序，将所出现的每一个TFTP替换为RCP。例如，用 **copy rcp flash 命令代替 copy tftp flash 命令。**

```
Router (boot)#copy tftp flash
```

7. 指定 TFTP 服务器的 IP 地址。出现提示时，输入TFTP服务器的IP地址，如以下示例所示：

```
Address or name of remote host [255.255.255.255]? 172.17.247.195
```

8. 指定新思科 IOS 软件映像的文件名。出现提示时，输入要安装的Cisco IOS软件映像的文件名，如以下示例所示：

```
Source file name? c1600-y-l.122-7b.bin
```

注意：文件名区分大小写，因此请确保输入正确。

9. 指定目标镜像文件名。这是新软件镜像加载至路由器时所具有的名称。镜像可以任意命名，但普遍做法是输入同一个镜像文件名。

```
Destination file name [c1600-y-l.112-18.P]? c1600-y-l.122-7b.bin
```

10. 在回答是或否之前，请先清除闪存设备。当您看到以下提示时：

```
Erase flash device before writing? [confirm] yes/no
```

输入**yes** 清除路由器闪存中现有的软件映像，然后再复制新软件映像。输入**no**以保留现有软件映像。确认您有足够的内存来保存两者。复制过程需要几分钟。时间因网络而异。在复制过程中，会显示一些消息，说明哪些文件已经被访问过。感叹号(!)表示正在进行复制过程。每个感叹号(!)表示已成功传输十个数据包。镜像的校验和验证将在镜像写入闪存后执行。软件升级完成时，路由器或接入服务器必须重新加载新映像。

11. 在重新加载之前，请验证映像安装。确认镜像已正确安装在闪存上，同时boot system命令指向适当的文件开始下载。要重新加载，请输入：

```
Router(boot)#reload
*Mar 1 00:30:49.972: %SYS-5-CONFIG_I: Configured from console by console
System configuration has been modified. Save? [yes/no]: NO
Proceed with reload? [confirm] YES
```

12. 验证路由器是否使用正确的映像运行。在重新加载完成之后，路由器应运行所需的 Cisco IOS 软件映像。发出show version命令以验证升级。

输出示例 - Cisco 1600 系列路由器 - 从闪存安装中运行

```
Router >enable
Password:
Router#show version
Cisco Internetwork Operating System Software
IOS (tm) 1600 Software (C1600-NY-L), Version 12.0(9), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Tue 05-Mar-02 01:14 by pwade
Image text-base: 0x08039850, data-base: 0x02005000

ROM: System Bootstrap, Version 11.1(10)AA, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)
ROM: 1600 Software (C1600-BOOT-R), Version 11.1(10)AA, EARLY DEPLOYMENT
RELEASE SOFTWARE (fc1)

Router uptime is 7 minutes
System returned to ROM by reload
System image file is "flash:c1600-ny-l.120-9.bin"

cisco 1602 (68360) processor (revision C) with 7680K/2560K bytes of memory.
Processor board ID 14236252, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
On-board Switched 56K Line Interface.
System/IO memory with parity disabled
2048K bytes of DRAM onboard 8192K bytes of DRAM on SIMM
System running from FLASH
7K bytes of non-volatile configuration memory.
12288K bytes of processor board PCMCIA flash (Read ONLY)

Configuration register is 0x2102
!-- This is the original value of the configuration register. Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#config-register 0x2101
Router(config)#^Z
Router#
*Mar  1 00:03:32.656: %SYS-5-CONFIG_I: Configured from console by console
Router#reload
Proceed with reload? [confirm]

*Mar  1 00:02:00: %SYS-5-RELOAD: Reload requested

System Bootstrap, Version 11.1(10)AA, EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)
Copyright (c) 1997 by cisco Systems, Inc.
C1600 processor with 10240 Kbytes of main memory

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(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

           cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706
```

```
Cisco Internetwork Operating System Software
IOS (tm) 1600 Software (C1600-BOOT-R), Version 11.1(10)AA, EARLY DEPLOYMENT
RELEASE SOFTWARE (fc1)
Copyright (c) 1986-1997 by cisco Systems, Inc.
Compiled Tue 18-Mar-97 14:01 by ccai
Image text-base: 0x04018060, data-base: 0x02005000

cisco 1602 (68360) processor (revision C) with 9728K/512K bytes of memory.
Processor board ID 14236252
X.25 software, Version 2.0, NET2, BFE and GOSIP compliant.
1 Ethernet/IEEE 802.3 interface.
1 Serial network interface.
On-board Switched 56K Line Interface.
System/IO memory with parity disabled
8K bytes of non-volatile configuration memory.
12288K bytes of processor board PCMCIA flash (Read/Write)


Press RETURN to get started!

00:00:14: %LINK-3-UPDOWN: Interface Ethernet0, changed state to up

Router(boot)>enable
Password:
Router(boot)#
Router(boot)#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(boot)(config)#config-register 0x2102
Router(boot)(config)#^Z
Router(boot)#
Router(boot)#ping 172.17.247.195

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 172.17.247.195, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/200/1000 ms

Router(boot)#copy tftp flash

PCMCIA flash directory:
File  Length   Name/status
  1   5235300  /c1600-ny-l.120-9
[5235364 bytes used, 7347548 available, 12582912 total]
Address or name of remote host [255.255.255.255]? 172.17.247.195
Source file name? c1600-y-l.122-7b.bin
Destination file name [c1600-y-l.122-7b.bin]? y
Accessing file 'c1600-y-l.122-7b.bin' on 172.17.247.195...
Loading c1600-y-l.122-7b.bin from 172.17.247.195 (via Ethernet0): ! [OK]


Erase flash device before writing? [confirm] NO
!--- Enter "Yes" if your router does not have enough memory in the !--- Flash for both Cisco IOS
software images. Copy 'c1600-y-l.122-7b.bin' from server as 'c1600-y-l.122-7b.bin' into Flash
WITH erase? [yes/no]N
Loading c1600-y-l.122-7b.bin from 172.17.247.195 (via Ethernet0): !!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!
[OK - 7120752/12582912 bytes]

Verifying checksum...  OK (0xA523)
Flash device copy took 00:06:28 [hh:mm:ss]

Router(boot)#reload
*Mar  1 00:30:49.972: %SYS-5-CONFIG_I: Configured from console by consoled

System configuration has been modified. Save? [yes/no]: NO
Proceed with reload? [confirm] YES

*Mar  1 00:13:15: %SYS-5-RELOAD: Reload requested

System Bootstrap, Version 11.1(10)AA, EARLY DEPLOYMENT RELEASE SOFTWARE (fc1)
Copyright (c) 1997 by cisco Systems, Inc.
C1600 processor with 10240 Kbytes of main memory

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Software clause at DFARS sec. 252.227-7013.

           cisco Systems, Inc.
           170 West Tasman Drive
           San Jose, California 95134-1706


Cisco Internetwork Operating System Software
IOS (tm) 1600 Software (C1600-Y-L), Version 12.2(7b), RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Tue 05-Mar-02 01:14 by pwade
Image text-base: 0x08039850, data-base: 0x02005000

cisco 1602 (68360) processor (revision C) with 7680K/2560K bytes of memory.
Processor board ID 14236252, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
On-board Switched 56K Line Interface.
System/IO memory with parity disabled
2048K bytes of DRAM onboard 8192K bytes of DRAM on SIMM
System running from FLASH
7K bytes of non-volatile configuration memory.
12288K bytes of processor board PCMCIA flash (Read ONLY)

Press RETURN to get started!
```

发出**show version**命令以验证加载的Cisco IOS软件映像是否正确以及配置寄存器是否为0x2102。

```
Router >enable
Router# show version
Cisco Internetwork Operating System Software
```

```
IOS (tm) 1600 Software (C1600-Y-L), Version 12.2(7b), RELEASE SOFTWARE
(fc1)
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Tue 05-Mar-02 01:14 by pwade
Image text-base: 0x08039850, data-base: 0x02005000

ROM: System Bootstrap, Version 11.1(10)AA, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)
ROM: 1600 Software (C1600-BOOT-R), Version 11.1(10)AA, EARLY DEPLOYMENT
RELEASE SOFTWARE (fc1)

Router uptime is 7 minutes
System returned to ROM by reload
System image file is "flash:c1600-y-l.122-7b.bin"

cisco 1602 (68360) processor (revision C) with 7680K/2560K bytes of memory.
Processor board ID 14236252, with hardware revision 00000000
Bridging software.
X.25 software, Version 3.0.0.
1 Ethernet/IEEE 802.3 interface(s)
1 Serial network interface(s)
On-board Switched 56K Line Interface.
System/IO memory with parity disabled
2048K bytes of DRAM onboard 8192K bytes of DRAM on SIMM
System running from FLASH
7K bytes of non-volatile configuration memory.
12288K bytes of processor board PCMCIA flash (Read ONLY)

Configuration register is 0x2102
```

相关信息

- Field Notice：Cisco IOS TFTP 客户端无法传输大于 16MB 的文件
- Cisco IOS软件版本
- 路由器支持页
- 技术支持和文档 - Cisco Systems