



Configuring T3 or E3 Interfaces

This section provides the information about how to configure a T3 or E3 interface. The T3 or E3 interface can be configured as clear channel mode or channelized mode.

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Configuring the Mode

To enable the mode on the T3/E3 interface module, follow these steps:

```
enable
configure terminal
controller mediatype 0/4/0
mode t3
exit
```

To disable the mode use the **no mode** command.

Configuring the Controller

Configuring the Controller - Clear Channel T3 or E3 Interfaces

Before You Begin

When the clear channel T3 or E3 interface is used for the first time, the running configuration does not show the T3 or E3 controller. You can use the **show platform** command to check whether the chassis recognizes the T3 or E3 port and initializes the card correctly. After the port is configured for the slot, the respective controller appears in the running configuration and you can configure the clear channel T3 or E3 interface.

Perform this task to configure clear channel controller as T3.

```
enable
```

```

configure terminal
controller t3 0/4/40
no channelized
clock source line
no shut
exit

```



Note By default, the T3 controller is in C-Bit framing mode. To configure CEM, the framing mode must be set to unframed.

Perform this task to configure clear channel controller as E3.

```

enable
configure terminal
controller e3 0/4/40
clock source line
no shut
exit

```

Configuring the Controller - Channelized T3 or E3 Interfaces

Before You Begin

When the channelized T3 or E3 interface is used for the first time, the running configuration does not show the T3 or E3 controller. You can use the **show platform** command to check if the chassis recognizes the T3 or E3 port and initializes the card properly. After the port is configured for the slot, the respective controller appears in the running configuration and you can configure the channelized T3 or E3 interface.

Perform this task to configure channelized controller as T3.

```

enable
configure terminal
controller t3 0/4/46
channelized
clock source line
no shut
exit

```



Note The channelized mode is the default mode for T3 interface.

Perform this task to configure channelized controller as E3.

```

enable
configure terminal
controller e3 0/4/46
channelized mode e1
framing g751
exit

```



Note The clear channel mode is the default mode for E3 interface.

Table 1: Feature History

Feature Name	Release Information	Description
Channelize the T3 interface into E1 lines	Cisco IOS XE Bengaluru 17.6.2	Support for the T3 interface to be channelized into 21 E1 lines.

Starting with Cisco IOS XE Bengaluru 17.6.2, T3 interface can be channelized to 21 E1 lines.

To channelize the T3 interface into E1 lines, use the following commands:

```
enable
configure terminal
controller MediaType0/1/1
mode t3
controller t30/1/1
channelized mode e1
framing c-bit
exit
```

SATOP

Configuring SAToP - Clear Channel T3 or E3 Interfaces

Before You Begin

Before Structure-Agnostic TDM over Packet (SAToP) is configured, the controller of clear channel T3 interface must be configured.

```
enable
configure terminal
controller t3 0/4/40
no channelized
cem-group 0 unframed
interface CEM 0/4/40
cem 0
xconnect 10.10.2.2 204 encapsulation mpls
exit
```

Before You Begin

Before SAToP is configured, the controller of clear channel E3 interface must be configured.

```
enable
configure terminal
controller e3 0/4/40
no channelized
cem-group 0 unframed
```

```
interface CEM 0/4/40
cem 0
xconnect 10.10.2.2 204 encapsulation mpls
exit
```

Verifying the configuration



Note The **no channelize** is displayed in show running-configuration when cem-group 0 unframed is configured.

```
Router(config-controller)# show run
controller MediaType 0/4/40
mode e3
controller 0/4/40
threshold sd-ber 6
threshold sf-ber 3
no channelized
framing g751
cablelength short
cem-group 0 framed
controller MediaType 0/4/40
interface CEM8/1/10/4/40
no ip address
cem 0
!
```

Configuring SAToP - Channelized T3 Interfaces

Before You Begin

Before SAToP is configured, the controller of channelized T3 interface must be configured.

```
enable
configure terminal
controller t3 0/4/12
channelized
t1 1 cem-group 0 unframed
interface CEM 0/4/12
cem 0
xconnect 10.10.2.2 204 encapsulation mpls
exit
```

Configuring SAToP - Channelized E3 Interfaces

Before You Begin

Before SAToP is configured, the controller of channelized E3 interfaces must be configured.

```
enable
configure terminal
controller e3 0/4/46
channelized
e1 1 cem-group 0 unframed
interface CEM 0/4/46
```

```

cem 0
xconnect 10.10.2.2 204 encapsulation mpls
exit

```

Configuring Framed SAToP - Channelized T3 Interfaces



Note Framing type should be maintained same in all routers end to end.

To configure the controller of channelized T3 interface for framed SAToP:

```

enable
configure terminal
controller t3 0/4/46
channelized mode
framing c-bit
t1 1 cem-group 0 framed
interface CEM 0/4/46
cem 0
xconnect 10.10.2.2 204 encapsulation mpls
exit

```

Configuring Framed SAToP - Channelized E3 Interfaces

To configure the controller of channelized E3 interfaces for Framed SAToP:

```

enable
configure terminal
controller e3 0/4/46
channelized mode e1
framing g751
e1 1 cem-group 0 framed
interface CEM 0/4/46
cem 0
xconnect 10.10.2.2 204 encapsulation mpls
exit

```

CESoPN

Configuring CESoPSN - Channelized T3 or E3 Interfaces

Before You Begin

Create CEM group for channelized T3 interface, use the following commands:

```

enable
configure terminal
controller MediaType 0/5/1
mode t3
channelized
controller T3 0/5/1
framing c-bit

```

```

cablelength short
t1 1 cem-group 1 timeslots 10
exit

```

Create CEM group for channelized E3 interface, use the following commands:

```

enable
configure terminal
controller MediaType 0/5/1
mode e3
channelized mode e1
controller e3 0/14/0
channelized
cablelength short
e1 1 cem-group 0 timeslots 10
exit

```

Configure xconnect:

```

int cem 0/14/0
cem 0
xconnect 10.1.1.1 9999 encapsulation mpls

```

Verify the xconnect status:

```

sh xconnect all | i 9999
UP pri ac CE0/14/0:0(CESoPSN Basic) UP mpls 10.1.1.1:9999 UP

```

Verifying CESoPSN Configurations - Channelized E3 Interface

This section includes show commands for CESoPSN:

```

Router# show controllers e3 0/14/2
E3 0/14/2 is up.
Hardware is ASR903-48T3E3-CE
Applique type is Channelized E3
No alarms detected.
Framing is E3 G751, Line Code is HDB3, Cablelength Short less than 225ft
BER thresholds: SF = 10e-10 SD = 10e-10
Clock Source is internal, National Bit 0
Equipment customer loopback
Data in current interval (240 seconds elapsed):
Near End
  0 Line Code Violations, 0 P-bit Coding Violations
  0 C-bit Coding Violations, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
  0 Severely Errored Line Secs, 0 Path Failures
  0 AIS Defect Secs, 0 LOS Defect Secs
Far End
  0 Errored Secs, 0 Severely Errored Secs
  0 C-bit Unavailable Secs, 0 Path Failures
  0 Code Violations, 0 Service Affecting Secs
Data in Interval 1:
Near End
  0 Line Code Violations, 0 P-bit Coding Violations
  0 C-bit Coding Violations, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  20 Unavailable Secs, 20 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
  20 Severely Errored Line Secs, 1 Path Failures

```

```

    0 AIS Defect Secs, 20 LOS Defect Secs
  Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs
Total Data (last 1 15 minute intervals):
  Near End
    0 Line Code Violations, 0 P-bit Coding Violations,
    0 C-bit Coding Violations, 0 P-bit Err Secs,
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
    20 Unavailable Secs, 20 Line Errored Secs,
    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
    20 Severely Errored Line Secs, 1 path failures
    0 AIS Defect Secs, 20 LOS Defect Secs
  Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs

E1 1 is up
timeslots:
FDL per AT&T 54016 spec.
No alarms detected.
Framing is crc4, Clock Source is Internal, National bits are 0x1F.
Data in current interval (250 seconds elapsed):
  Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    0 Path Failures, 0 SEF/AIS Secs
  Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
    0 Unavailable Secs 0 Path Failures
Data in Interval 1:
  Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    1 Path Failures, 2 SEF/AIS Secs
  Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
    0 Unavailable Secs 0 Path Failures
Total Data (last 1 15 minute intervals):
  Near End
    0 Line Code Violations,0 Path Code Violations,
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    1 Path Failures, 2 SEF/AIS Secs
  Far End
    0 Line Code Violations,0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
    0 Unavailable Secs, 0 Path Failures

```

```

router# sh mpls l2 vc interface cem 0/14/0 0
-----
Local intf      Local circuit    Dest address     VC ID           Status
-----
CE0/14/0       CESoPSN Basic 0 10.1.1.1        9999            UP

```

```

router# sh mpls l2transport vc 9090 detail
Local interface: CE0/14/2 up, line protocol up, CESoPSN Basic 0 up
Destination address: 10.1.1.1, VC ID: 9090, VC status: up
Output interface: Te0/12/0, imposed label stack {130}
Preferred path: not configured
Default path: active
Next hop: 209.165.202.129
Create time: 00:18:44, last status change time: 00:18:30
Last label FSM state change time: 00:18:30
Signaling protocol: LDP, peer 10.1.1.1:0 up
Targeted Hello: 10.2.2.2(LDP Id) -> 10.1.1.1, LDP is UP
Graceful restart: not configured and not enabled
Non stop routing: configured and not enabled
Status TLV support (local/remote) : enabled/supported
LDP route watch : enabled
Label/status state machine : established, LruRru
Last local dataplane status rcvd: No fault
Last BFD dataplane status rcvd: Not sent
Last BFD peer monitor status rcvd: No fault
Last local AC circuit status rcvd: No fault
Last local AC circuit status sent: No fault
Last local PW i/f circ status rcvd: No fault
Last local LDP TLV status sent: No fault
Last remote LDP TLV status rcvd: No fault
Last remote LDP ADJ status rcvd: No fault
MPLS VC labels: local 130, remote 130
Group ID: local 207, remote 220
MTU: local 0, remote 0
Remote interface description:
Sequencing: receive disabled, send disabled
Control Word: On (configured: autosense)
SSO Descriptor: 10.1.1.1/9090, local label: 130
Dataplane:
SSM segment/switch IDs: 1237749/557811 (used), PWID: 114
VC statistics:
transit packet totals: receive 0, send 0
transit byte totals: receive 0, send 0
transit packet drops: receive 0, seq error 0, send 0
ASR907# sh cem circuit interface cem 0/14/2 0
CEM0/14/2, ID: 0, Line: UP, Admin: UP, Ckt: ACTIVE
Mode :Channelized-E1, E1: 1, CEM Mode: E1-CESoP
Controller state: up, T1 state: up
Idle Pattern: 0xFF, Idle CAS: 0x8
Dejitter: 5 (In use: 0)
Payload Size: 160
Framing: Framed (DS0 channels: 1-20)
CEM Defects Set
None
Signalling: No CAS
RTP: No RTP
Ingress Pkts: 24005 Dropped: 0
Egress Pkts: 24005 Dropped: 0
CEM Counter Details
Input Errors: 0 Output Errors: 0
Pkts Missing: 0 Pkts Reordered: 0
Misorder Drops: 0 JitterBuf Underrun: 0
Error Sec: 0 Severly Errored Sec: 0
Unavailable Sec: 0 Failure Counts: 0

```



```

Pkts Malformed: 0          JitterBuf Overrun: 0
Generated Lbits: 0         Received Lbits: 0
Generated Rbits: 0         Received Rbits: 0
Generated Mbits: 0         Received Mbits: 0

```

Configuring CEM Group for CESoPSN - Channelized T3 Interface

The following section describes how to configure a CEM group for CESoPSN on the channelized T3 interface:

```

controller MediaType 0/5/1
  mode t3
  channelized
controller T3 0/5/1
  framing c-bit
  cablelength short
  t1 1 cem-group 1 timeslots 1-10

```

Verifying CEM for CESoPSN - Channelized T3 Interface

Use the following commands to verify the pseudowire configuration for CESoPSN:

- **show cem circuit**—Displays information about the circuit state, administrative state, the CEM ID of the circuit, and the interface on which it is configured. If cross connect is configured under the circuit, the command output also includes information about the attachment circuit status.
- **show mpls 12 vc**—Displays information about the MPLS VC.
- **show mpls 12 vc detail**—Displays detailed information about the MPLS VC.

```

Router# show controllers e3 0/14/2
E3 0/14/2 is up.
  Hardware is ASR903-48T3E3-CE
  Applique type is Channelized E3
  No alarms detected.
  Framing is E3 G751, Line Code is HDB3, Cablelength Short less than 225ft
  BER thresholds: SF = 10e-10 SD = 10e-10
  Clock Source is internal, National Bit 0
  Equipment customer loopback
Data in current interval (240 seconds elapsed):
  Near End
    0 Line Code Violations, 0 P-bit Coding Violations
    0 C-bit Coding Violations, 0 P-bit Err Secs
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
    0 Unavailable Secs, 0 Line Errored Secs
    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
    0 Severely Errored Line Secs, 0 Path Failures
    0 AIS Defect Secs, 0 LOS Defect Secs
  Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs
Data in Interval 1:
  Near End
    0 Line Code Violations, 0 P-bit Coding Violations
    0 C-bit Coding Violations, 0 P-bit Err Secs
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
    20 Unavailable Secs, 20 Line Errored Secs
    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs

```

```

    20 Severely Errored Line Secs, 1 Path Failures
    0 AIS Defect Secs, 20 LOS Defect Secs
Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs
Total Data (last 1 15 minute intervals):
Near End
    0 Line Code Violations, 0 P-bit Coding Violations,
    0 C-bit Coding Violations, 0 P-bit Err Secs,
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
    20 Unavailable Secs, 20 Line Errored Secs,
    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
    20 Severely Errored Line Secs, 1 path failures
    0 AIS Defect Secs, 20 LOS Defect Secs
Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs

E1 1 is up
timeslots: 1-20
No alarms detected.
Framing is crc4, Clock Source is Internal, National bits are 0x1F.
Data in current interval (250 seconds elapsed):
Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    0 Path Failures, 0 SEF/AIS Secs
Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
    0 Unavailable Secs 0 Path Failures
Data in Interval 1:
Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    1 Path Failures, 2 SEF/AIS Secs
Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
    0 Unavailable Secs 0 Path Failures
Total Data (last 1 15 minute intervals):
Near End
    0 Line Code Violations,0 Path Code Violations,
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    1 Path Failures, 2 SEF/AIS Secs
Far End
    0 Line Code Violations,0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
    0 Unavailable Secs, 0 Path Failures

```

```
router# sh mpls 12 vc interface cem 0/14/0 0
```

Local intf	Local circuit	Dest address	VC ID	Status
CE0/14/0	CESoPSN Basic 0	10.1.1.1	9999	UP

```

Router# sh mpls l2transport vc 9090 detail
Local interface: CE0/14/2 up, line protocol up, CESoPSN Basic 0 up
  Destination address: 10.1.1.1, VC ID: 9090, VC status: up
  Output interface: Te0/12/0, imposed label stack {130}
  Preferred path: not configured
  Default path: active
  Next hop: 209.165.202.129
  Create time: 00:18:44, last status change time: 00:18:30
  Last label FSM state change time: 00:18:30
  Signaling protocol: LDP, peer 10.1.1.1:0 up
  Targeted Hello: 10.2.2.2(LDP Id) -> 10.1.1.1, LDP is UP
  Graceful restart: not configured and not enabled
  Non stop routing: configured and not enabled
  Status TLV support (local/remote) : enabled/supported
  LDP route watch : enabled
  Label/status state machine : established, LruRru
  Last local dataplane status rcvd: No fault
  Last BFD dataplane status rcvd: Not sent
  Last BFD peer monitor status rcvd: No fault
  Last local AC circuit status rcvd: No fault
  Last local AC circuit status sent: No fault
  Last local PW i/f circ status rcvd: No fault
  Last local LDP TLV status sent: No fault
  Last remote LDP TLV status rcvd: No fault
  Last remote LDP ADJ status rcvd: No fault
  MPLS VC labels: local 130, remote 130
  Group ID: local 207, remote 220
  MTU: local 0, remote 0
  Remote interface description:
  Sequencing: receive disabled, send disabled
  Control Word: On (configured: autosense)
  SSO Descriptor: 10.1.1.1/9090, local label: 130
  Dataplane:
  SSM segment/switch IDs: 1237749/557811 (used), PWID: 114
  VC statistics:
  transit packet totals: receive 0, send 0
  transit byte totals: receive 0, send 0
  transit packet drops: receive 0, seq error 0, send 0

```

```

Router# sh cem circuit interface cem 0/14/2 0

CEM0/14/2, ID: 0, Line: UP, Admin: UP, Ckt: ACTIVE
Mode :Channelized-E1, E1: 1, CEM Mode: E1-CESoP
Controller state: up, T1 state: up
Idle Pattern: 0xFF, Idle CAS: 0x8
Dejitter: 5 (In use: 0)
Payload Size: 160
Framing: Framed (DS0 channels: 1-20)
CEM Defects Set
None

Signalling: No CAS
RTP: No RTP

Ingress Pkts: 24005 Dropped: 0
Egress Pkts: 24005 Dropped: 0

CEM Counter Details

```

```

Input Errors:      0          Output Errors:      0
Pkts Missing:     0          Pkts Reordered:    0
Misorder Drops:   0          JitterBuf Underrun: 0
Error Sec:        0          Severly Errored Sec: 0
Unavailable Sec:  0          Failure Counts:     0
Pkts Malformed:  0          JitterBuf Overrun:  0
Generated Lbits:  0          Received Lbits:     0
Generated Rbits:  0          Received Rbits:     0
Generated Mbits:  0          Received Mbits:     0

```

Configuring DS1 Local Connect on T3/E3 Interface

The following section describes how to configure the first segment for DS1 local connection:

```

enable
configure terminal
controller MediaType 0/5/7
  mode e3
channelized mode e1
controller E3 0/5/7
  e1 2 cem-group 1 timeslots 1-10

```

The following section describes how to configure the second segment for DS1 local connection:

```

enable
configure terminal
controller MediaType 0/5/2
  mode e3
channelized mode e1
controller E3 0/5/2
  e1 2 cem-group 1 timeslots 1-10

```

The following section describes how to create a DS1 local connection:

```

enable
configure terminal
connect ds1_connect CEM0/5/7 1 CEM CEM0/5/2 1

```

Verifying DS1 Local Connect on T3 Interface

Use the following commands to verify the DS1 local connection:

- **show connection name**—Displays information about the connection state and segment state.

```

ASR907# sh xconnect all | i 0/14/7
UP pri   ac CE0/14/2:2(CESoPSN Basic)   UP   ac CE0/14/7:2(CESoPSN Basic)   UP

ASR907# sh connection all | i 0/14/7
38  local_t3      CE0/14/2 CESP 2      CE0/14/7 CESP 2      UP

```

Configuring T3 or E3 CEP

Pre-requisites:

The default mode is channelized mode. Use **no channelized** command to change to non-channelized mode.

To configure T3 or E3 CEP for mode T3:

```

enable
controller MediaType 0/3/0
mode t3
controller t3 0/3/0
no channelized
cem-group 0 cep

```

To configure T3 or E3 CEP for mode E3:

```

enable
controller MediaType 0/3/0
mode e3
controller e3 0/3/0
no channelized
cem-group 0 cep

```

Configuration of Overhead C2 and J1 Bytes:

You can configure overhead C2 and J1 bytes after you configure T3 or E3 CEP.

```

enable
controller MediaType 0/14/44
mode e3
controller e3 0/14/44
threshold sd-ber 6
threshold sf-ber 3
no channelized
framing g751
cablelength short
cem group 0 cep
overhead j1 tx length 16
overhead j1 expected length 16

```

For loopback configuration, see *Loopback on T3 or E3 Interfaces* section.

Verifying T3 or E3 CEP Configuration

Use **show controller t3 0/1/20 path** to verify T3 or E3 CEP configuration:

```

router#show controller t3 0/1/20 path

T3 0/1/20 PATH 1.

Asynchronous Mapping for DS3 into STS-1

TX : TDM to PSN direction
RX : PSN to TDM direction

Clock Source is internal

      AIS = 0          RDI = 0          REI = 349          BIP(B3) = 22
      LOP = 0          PSE = 0          NSE = 0           NEWPTR = 0
      LOM = 0          PLM = 0          UNEQ = 0

Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: None

TCA threshold:  B3 = 10e-6
Rx: C2 = FF
Tx: C2 = 01

Tx J1 Length : 64
Tx J1 Trace

```

```

72 74 72 32 20 30 2F 31 2F 32 30 2E 31 00 00 00      rtr2 0/1/20.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

Expected J1 Length : 64
Expected J1 Trace

72 74 72 32 20 30 2F 31 2F 32 30 2E 31 00 00 00      rtr2 0/1/20.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

PATH TRACE BUFFER : UNSTABLE

Rx J1 Length : 64
Rx J1 Trace

72 73 70 32 20 30 2F 35 2F 31 32 2E 31 00 00 00      rsp2 0/5/12.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

rtr2#

```



Note The verification output does not provide the alarm details.

STS-1 Electricals

Configuring STS-1e Modes

Configuring STS-1e Modes for Unframed SAToP

STS-1e supports unframed SAToP and you can configure STS-1e under VT-15, CT3, T3, and unframed modes. There is no default mode for STS-1e.

To configure STS-1e modes for unframed SAToP, use the following commands:

```

enable
configure terminal
controller sts-1e 0/0/16
sts-1 1
mode {vt-15 | ct3 | t3 | unframed}
end

```



Note To restore the system to its default condition, use the **no** form of the command.

Configuring STS-1e Modes for Framed SAToP

Starting from Cisco IOS XE Bengaluru 17.4.1, STS-1e supports framed SAToP. You can configure STS-1e under VT-15, CT3, and T3 modes for framed SAToP:

To configure STS-1e modes for framed SAToP, use the following commands:

```
enable
configure terminal
controller sts-1e 0/0/16
sts-1 1
mode {vt-15 | ct3 | t3}
end
```

Configuring VT-15 Mode of STS-1e

Configuring VT-15 Mode of STS-1e for Unframed SAToP

To configure VT-15 mode of STS-1e for unframed SAToP, enter the following commands:

```
enable
configure terminal
controller STS1E 0/3/14
no ais-shut
alarm-report all
clock source internal
!
sts-1 1
clock source internal
mode vt-15
vtg 1 t1 1 framing unframed
vtg 1 t1 1 cem-group 0 unframed
```

Configuring VT-15 Mode of STS-1e for Framed SAToP

To configure VT-15 mode of STS-1e for framed SAToP, enter the following commands:

```
enable
configure terminal
controller STS1E 0/3/14
no ais-shut
alarm-report all
clock source internal
!
sts-1 1
clock source internal
mode vt-15
vtg 1 t1 1 cem-group 0 framed
```

Configuring T1 CT3 mode of STS-1e

Configuring T1 CT3 mode of STS-1e for Unframed SAToP

To configure T1 CT3 mode of STS-1, you can configure the T1 link using the following steps:

```
enable
configure terminal
controller sts-1e 0/0/16
sts-1 1
mode ct3
```

```
t1 1 clock source internal
t1 1 framing unframed
end
```



Note To restore the system to its default condition, use the **no** form of the command.

Configuring T1 CT3 mode of STS-1e for Framed SAToP

To configure T1 CT3 mode of STS-1 for framed SAToP, you can configure the T1 link using the following steps:

```
enable
configure terminal
controller sts-1e 0/0/16
sts-1 1
mode ct3
t1 1 clock source internal
t1 1 cem-group 0 framed
end
```

Configuring T3 mode of STS-1e

Configuring T3 mode of STS-1e for Unframed SAToP

```
controller STS1E 0/3/14
no ais-shut
alarm-report all
clock source internal
!
sts-1 1
clock source internal
mode t3
cem-group 0 unframed
t3 clock source internal
```

Configuring T3 mode of STS-1e for Framed SAToP

```
controller STS1E 0/3/14
no ais-shut
alarm-report all
clock source internal
!
sts-1 1
clock source internal
mode t3
cem-group 0 framed
t3 clock source internal
```

Configuring Unframed Mode of STS-1e

```
controller STS1E 0/3/14
no ais-shut
alarm-report all
clock source internal
!
sts-1 1
clock source internal
```



```
mode unframed
cem-group 0 cep
```

Configuring Line and Section Overhead

To configure line and section overhead, use the following commands:

```
enable
configure terminal
controller MediaType 0/0/16
mode sts-1e
controller sts-1e 0/0/16
overhead s1s0 2
overhead j0 tx length 1-byte
end
```



Note To restore the system to its default condition, use the **no** form of the command.

Configuring Line Loopback

To configure loopback, use the following commands:

```
enable
configure terminal
controller sts-1e 0/0/16
loopback local
end
```



Note To restore the system to its default condition, use the **no** form of the command.

Configuring AIS Shut

Alarm Indication Signal (AIS) shut when enabled on the STS-1e controller results in sending AIS alarm to peer node.

To configure AIS-Shut, use the following commands:

```
enable
configure terminal
controller sts-1e 0/0/16
ais-shut
end
```



Note The **no ais-shut** command will not send AIS.

Configuring Shut

To configure Shut, use the following commands:

```
enable
configure terminal
controller sts-1e 0/0/16
shutdown
end
```



Note Use the **no shutdown** command to disable the interface.

Configuring Clock

To configure clock, use the following commands:

```
enable
configure terminal
controller MediaType 0/0/16
mode sts-1e
controller sts-1e 0/0/16
clock source line
end
```



Note The default mode is internal.



Note ACR and DCR clock recovery are also supported.

Configuring Clock Recovery on STS-1e for Framed SAToP

Starting from Cisco IOS XE Bengaluru 17.4.1, ACR and DCR is supported on STS-1e for framed SAToP.

For more information, see *Configuring Clock Recovery on STS-1e Controller for Framed SAToP*.

Configuring Network-Clock STS-1e

To configure network-clock STS-1e, use the following commands:

```
enable
configure terminal
network-clock input-source 1 controller STS-1e 0/0/16
end
```

Configuring Clock Recovery on STS-1e Controller for Framed SAToP

Table 2: Feature History

Feature Name	Release Information	Description
STS1E Framed SAToP Support on IMA3G	Cisco IOS XE Bengaluru 17.4.1	Support on clock recovery on STS-1e controller for framed SAToP on the following modes: <ul style="list-style-type: none"> • T3 • CT3 • VT-15

Starting from Cisco IOS XE Bengaluru 17.4.1, ACR and DCR are supported on STS-1e controller for framed SAToP.

To configure the clock on STS-1e controller for framed SAToP on the T3 mode, enter the following commands:

```
enable
configure terminal
controller STS-1e slot/bay/port
sts-1 1
mode t3
t3 framing c-bit
cem-group 0 framed
t3 clock source recovered 1
```

To configure the clock on STS-1e controller for framed SAToP on the CT3 mode, enter the following commands:

```
enable
configure terminal
controller STS-1e slot/bay/port
sts-1 1
clock source internal
mode ct3
t3 framing c-bit
t1 1 cem-group 0 framed
t1 1 clock source recovered 1
```

To configure the clock on STS-1e controller for framed SAToP on the VT-15 mode, enter the following commands:

```
enable
configure terminal
controller STS-1e slot/bay/port
sts-1 1
mode vt-15
vtg 1 t1 1 cem-group 0 framed
vtg 1 t1 1 clock source recovered 2
```

The following example shows how to configure the clock on STS-1e controller for framed SAToP on the T3 mode:

```
enable
configure terminal
controller STS-1e 0/8/12
sts-1 1
mode t3
t3 framing c-bit
cem-group 0 framed
t3 clock source recovered 1
```

The following example shows how to configure the clock on STS-1e controller for framed SAToP on the CT3 mode:

```
enable
configure terminal
controller STS-1e 0/8/12
sts-1 1
clock source internal
mode ct3
t3 framing c-bit
t1 1 cem-group 0 framed
t1 1 clock source recovered 1
```

The following example shows how to configure the clock on STS-1e controller for framed SAToP on the VT-15 mode:

```
enable
configure terminal
controller STS-1e 0/8/12
sts-1 1
mode vt-15
vtg 1 t1 1 cem-group 0 framed
vtg 1t1 1 clock source recovered 2
```

Verifying STS-1e Configuration

The following sample output shows the verification of STS-1e configuration in unframed mode:

```
router#show controllers sts1e 0/3/14
STS1E 0/3/14 is up.                    =====> this is the controller/port status.

    Hardware is A900-IMA3G-IMSG

    Port configured rate: OC3           =====> this is the rate the port is
    configured on it.

    Applique type is Channelized STS1E
    Clock Source is Internal            ===> the clocking config

Medium info:
  Type: STS1E, Line Coding: NRZ,
  Alarm Throttling: OFF
SECTION:
  LOS = 0          LOF = 0          BIP(B1) = 0          =====> the section level
  alarm counter (from last clear counters)

STS1E Section Tables
  INTERVAL      CV      ES      SES      SEFS
```



```
Tx J1 Length : 64
Tx J1 Trace

 52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00   RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
```

```
Expected J1 Length : 64
Expected J1 Trace

 52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00   RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
```

PATH TRACE BUFFER : UNSTABLE

```
Rx J1 Length : 64
Rx J1 Trace

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   .....
```

```
SONET Path Tables
INTERVAL      CV      ES      SES      UAS      CVFE      ESFE      SESFE      UASFE
05:26-05:28   0       0       0       48       0         0         0         0
```

```
STS1E 0/3/14.1 PATH mode UNFRAMED is up
cep is configured: TRUE cem_id :0
clock source internal
```

The following sample output shows the verification of STS-1e configuration in VT-15 mode:

```
router#show controllers sts1e 0/3/14
STS1E 0/3/14 is up.
  Hardware is A900-IMA3G-IMSG

  Port configured rate: OC1
  Applique type is Channelized STS1E
  Clock Source is Internal
Medium info:
  Type: STS1E, Line Coding: NRZ,
  Alarm Throttling: OFF
SECTION:
  LOS = 0          LOF = 0          BIP(B1) = 0

STS1E Section Tables
INTERVAL      CV      ES      SES      SEFS
05:33-05:33   0       0       0       0

LINE:
  AIS = 0          RDI = 0          REI = 0          BIP(B2) = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: SLOS SLOF LAIS SF SD LRDI B1-TCA B2-TCA
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6
Rx: SISO = 00
   JO = 00
```

RX S1 = 00

Tx: S1S0 = 00
J0 = 04

Tx J0 Length : 64
Tx J0 Trace :

52 53 50 32 20 20 20 20 20 20 20 20 20 20 20 20 20 20 RSP2
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 ..

Expected J0 Length : 64
Expected J0 Trace :

52 53 50 32 20 20 20 20 20 20 20 20 20 20 20 20 20 20 RSP2
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 ..

Rx J0 Length : 16
Rx J0 Trace :

CRC-7: 0xD8 ERROR

BC 4B 69 CC 79 24 1B 01 E8 EB 9C 36 FC 29 A9 00 .Ki.y\$.6.) ..

STS1E Line Tables

INTERVAL	CV	ES	SES	UAS	CVFE	ESFE	SESFE	UASFE
05:33-05:33	0	0	0	0	0	0	0	0

High Order Path:

PATH 1:

Clock Source is internal

AIS = 0 RDI = 0 REI = 0 BIP(B3) = 0
LOP = 0 PSE = 0 NSE = 0 NEWPTR = 0
LOM = 0 PLM = 0 UNEQ = 0

Active Defects: None

Detected Alarms: None

Asserted/Active Alarms: None

Alarm reporting enabled for: PAIS PRDI PUNEQ PLOP PPLM LOM B3-TCA

TCA threshold: B3 = 10e-6

Rx: C2 = 02

Tx: C2 = 02

Tx J1 Length : 64
Tx J1 Trace

52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00 RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Expected J1 Length : 64
Expected J1 Trace

52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00 RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

```
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
```

PATH TRACE BUFFER : UNSTABLE

Rx J1 Length : 64

Rx J1 Trace

```
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
```

SONET Path Tables

INTERVAL	CV	ES	SES	UAS	CVFE	ESFE	SESFE	UASF
05:33-05:33	0	0	0	0	0	0	0	0

STS1E 0/3/14.1 PATH is up.
Hardware is A900-IMA3G-IMSG

Applique type is VT1.5

STS-1 1, VTG 1, VT 1 (STS1E 0/3/14.1/1/1 VT) is up
No VT alarms detected.

cep is configured: FALSE cem_id (0)
fwd_alarm_ais :0 fwd_alarm_rai :0
Framing is unframed, Clock Source is Internal
BIP2-tca:6, BIP2-sf:3, BIP2-sd:6

Tx V5:1

Rx V5:2

Tx J2 Length=64

TX J2 Trace Buffer:

```
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
```

Expected J2 Length=64

Expected J2 Trace Buffer:

```
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
```

Rx J2 Length=16

RX J2 Trace Buffer:

CRC-7: 0x80 OK

4A 44 53 55 00 00 00 00 00 00 00 00 00 00 00 00 JDSU.....

Data in current interval (1 seconds elapsed)

Near End
0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs
Far End
0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs

STS-1 1, VTG 1, T1 1 (STS1E 0/3/14.1/1/1 T1) is up
No alarms detected.

Framing is unframed, Clock Source is Internal

Data in current interval (0 seconds elapsed):

Near End
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins


```

STS1E Line Tables
INTERVAL      CV    ES    SES    UAS    CVFE    ESFE    SESFE    UASFE
05:35-05:35    0    0    0     73     0     0     0     0
    
```

High Order Path:

PATH 1:

Clock Source is internal

```

AIS = 0          RDI = 0          REI = 0          BIP(B3) = 0
LOP = 0          PSE = 0          NSE = 0          NEWPTR = 0
LOM = 0          PLM = 0          UNEQ = 0
    
```

Active Defects: None

Detected Alarms: None

Asserted/Active Alarms: None

Alarm reporting enabled for: PAIS PRDI PUNEQ PLOP PPLM LOM B3-TCA

TCA threshold: B3 = 10e-6

Rx: C2 = 04

Tx: C2 = 04

Tx J1 Length : 64

Tx J1 Trace

```

52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00    RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
    
```

Expected J1 Length : 64

Expected J1 Trace

```

52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00    RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
    
```

PATH TRACE BUFFER : UNSTABLE

Rx J1 Length : 64

Rx J1 Trace

```

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    .....
    
```

SONET Path Tables

```

INTERVAL      CV    ES    SES    UAS    CVFE    ESFE    SESFE    UASFE
05:26-05:36    0    0    0     12     0     0     0     0
    
```

STS1E 0/3/14.1 T3 is up.
Hardware is A900-IMA3G-IMSG

```

Applique type is T3
No alarms detected.
Framing is Unframed, Cablelength is 224
BER thresholds: SF = 10e-3 SD = 10e-6
Clock Source is internal
Equipment customer loopback
Data in current interval (560 seconds elapsed):
    
```

```

Near End
 0 Line Code Violations, 0 P-bit Coding Violation
 0 C-bit Coding Violation, 0 P-bit Err Secs
 0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
275 Unavailable Secs, 0 Line Errored Secs
 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
 0 Severely Errored Line Secs, 3 Path Failures
 0 AIS Defect Secs, 0 LOS Defect Secs
Far End
 0 Errored Secs, 0 Severely Errored Secs
 0 C-bit Unavailable Secs, 0 Path Failures
 0 Code Violations, 0 Service Affecting Secs
    
```

The following sample output shows the verification of STS-1e configuration in CT3 mode:

```

router#show controllers sts1e 0/3/14
STS1E 0/3/14 is up.
Hardware is A900-IMA3G-IMSG

Port configured rate: OC1
Applique type is Channelized STS1E
Clock Source is Internal
Medium info:
  Type: STS1E, Line Coding: NRZ,
Alarm Throttling: OFF
SECTION:
  LOS = 0          LOF = 0          BIP(B1) = 0

STS1E Section Tables
INTERVAL      CV      ES      SES      SEFS
05:41-05:42   0      10      10      10

LINE:
  AIS = 0          RDI = 0          REI = 0          BIP(B2) = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: SLOS SLOF LAIS SF SD LRDI B1-TCA B2-TCA
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6
Rx: S1S0 = 00
   J0 = 00

   RX S1 = 00

Tx: S1S0 = 00
   J0 = 04

Tx J0 Length : 64
Tx J0 Trace :

 52 53 50 32 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 RSP2
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 ..

Expected J0 Length : 64
Expected J0 Trace :

 52 53 50 32 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 RSP2
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 ..

Rx J0 Length : 16
    
```

```

Rx J0 Trace :
CRC-7: 0xD8 ERROR

BC 4B 69 CC 79 24 1B 01 E8 EB 9C 36 FC 29 A9 00      .Ki.y$.....6.)..

STS1E Line Tables
INTERVAL      CV    ES    SES    UAS    CVFE    ESFE    SESFE    UASFE
05:41-05:42    0    0    0    10    0    0    0    0

High Order Path:

PATH 1:
Clock Source is internal

AIS = 0          RDI = 0          REI = 0          BIP(B3) = 0
LOP = 0          PSE = 0          NSE = 0          NEWPTR = 0
LOM = 0          PLM = 0          UNEQ = 0

Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: PAIS PRDI PUNEQ PLOP PPLM LOM B3-TCA

TCA threshold: B3 = 10e-6
Rx: C2 = 04
Tx: C2 = 04

Tx J1 Length : 64
Tx J1 Trace

52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00      RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

Expected J1 Length : 64
Expected J1 Trace

52 53 50 32 20 30 2F 33 2F 31 34 2E 31 00 00 00      RSP2 0/3/14.1...
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

PATH TRACE BUFFER : UNSTABLE

Rx J1 Length : 64
Rx J1 Trace

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

SONET Path Tables
INTERVAL      CV    ES    SES    UAS    CVFE    ESFE    SESFE    UASFE
05:42-05:42    0    0    0    0    0    0    0    0

STS1E 0/3/14.1 T3 is up.
Hardware is A900-IMA3G-IMSG

Applique type is Channelized T3 to T1
No alarms detected.
MDL transmission is disabled
    
```

```

FEAC code received: No code is being received
Framing is C-BIT Parity, Cablelength is 224
BER thresholds: SF = 10e-3 SD = 10e-6
Clock Source is internal
Equipment customer loopback
Data in current interval (60 seconds elapsed):
Near End
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  25 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
  0 Severely Errored Line Secs, 0 Path Failures
  0 AIS Defect Secs, 0 LOS Defect Secs
Far End
  0 Errored Secs, 0 Severely Errored Secs
  0 C-bit Unavailable Secs, 0 Path Failures
  0 Code Violations, 0 Service Affecting Secs

STS-1 1, T1 1 (STS1E 0/3/14.1/1 T1) is up
No alarms detected.
Framing is unframed, Clock Source is Internal
Data in current interval (60 seconds elapsed):
Near End
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  25 Unavail Secs, 0 Stuffed Secs
Far End
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs

STS-1 1, T1 2 (STS1E 0/3/14.1/2 T1) is up
timeslots:
FDL per AT&T 54016 spec.
No alarms detected.
Framing is ESF, Clock Source is Internal
Data in current interval (60 seconds elapsed):
Near End
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  26 Unavail Secs, 0 Stuffed Secs
Far End
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs

```

Starting with Cisco IOS XE 17.11.1, you can view the previous day performance monitoring details using the following **show controller** commands for the STS-1e controllers.

- show controller sts1e
- show controller sts1e tabular
- show controller sts1e remote performance
- show controller sts1e remote performance tabular

```

router#show controllers sts1e 0/3/0

sts1e 0/3/0 is down.
  Hardware is NCS4200-1T8S-10CS

  Port configured rate: OC3
  Applique type is Channelized Sonet
  Clock Source is Internal
Medium info:
  Type: sts1e, Line Coding: NRZ,
  Alarm Throttling: OFF
SECTION:
  LOS = 1          LOF = 0          BIP(B1) = 0

sts1e Section Tables
  INTERVAL      CV      ES      SES      SEFS
  06:14-06:24   0      611    611    611
  05:59-06:14   0      901    901    901
  .....
  06:29-06:44   0      901    901    901
  06:14-06:29   0      901    901    901
Total of Data in Current and Previous Intervals
  06:14-06:24   0      87107  87107  87107
Total (Previous Day)
  05:29-05:29   0      86494  86494  86494

LINE:
  AIS = 0          RDI = 0          REI = 0          BIP(B2) = 0
Active Defects: None
Detected Alarms: SLOS SLOF LAIS
Asserted/Active Alarms: SLOS
.....
sts1e Line Tables
  INTERVAL      CV      ES      SES      UAS      CVFE      ESFE      SESFE      UASFE
  06:14-06:24   0      0      0      611      0      0      0      0
  05:59-06:14   0      0      0      901      0      0      0      0
  05:44-05:59   0      0      0      901      0      0      0      0
  05:29-05:44   0      0      0      901      0      0      0      0
  .....
  06:14-06:29   0      0      0      901      0      0      0      0
Total of Data in Current and Previous Intervals
  06:14-06:24   0      0      0      87107    0      0      0      0
Total (Previous Day)
  05:29-05:29   0      0      0      86494    0      0      0      0

PATH 1:
Clock Source is internal

  AIS = 0          RDI = 0          REI = 0          BIP(B3) = 8
  LOM = 0          PLM = 0          UNEQ = 0         LOP = 0
  .....

SONET Path Tables
  INTERVAL      CV      ES      SES      UAS      CVFE      ESFE      SESFE      UASFE
  06:14-06:24   0      0      0      609      0      0      0      0
  05:59-06:14   0      0      0      901      0      0      0      0
  05:44-05:59   0      0      0      900      0      0      0      0
  05:29-05:44   0      0      0      901      0      0      0      0
  .....
  06:29-06:44   0      0      0      900      0      0      0      0
  06:14-06:29   0      0      0      900      0      0      0      0
Total of Data in Current and Previous Intervals

```

```

06:14-06:24      0      0      0 87045      0      0      0      0
Total (Previous Day)
05:29-05:29      0      0      0 86435      0      0      0      0

PATH 2:
Clock Source is internal
.....

sts1e 0/3/0.1 PATH is down.
  Hardware is A900-IMA1Z8S-CX

Applique type is VT1.5

STS-1 1, VTG 1, VT 1 (sts1e 0/3/0.1/1/1 VT) is down
VT Receiver has LP_AIS.
cep is configured: FALSE cem_id (0)
fwd_alarm_ais :0   fwd_alarm_rai :0, Clock Source is Internal
BIP2-tca:6, BIP2-sf:3, BIP2-sd:6
Tx V5:2
Rx V5:0
Tx J2 Length=64
TX J2 Trace Buffer:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

Expected J2 Length=64
Expected J2 Trace Buffer:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....

Rx J2 Length=16
RX J2 Trace Buffer:
CRC-7: 0x60 ERROR

C9 79 F7 0F 5F D8 5D D2 D2 7C F6 0E 53 B2 0E 00   .y.._]..|..S...

Data in curerent interval (610 seconds elapsed)
Near End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 609 Unavailable Secs
Far End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs
Data in Interval 1:
Near End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 901 Unavailable Secs
Far End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs
.....
Data in Interval 96:
Near End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 900 Unavailable Secs
Far End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs
Total Data (last 96 fifteen minute intervals):
Near End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 86436 Unavailable Secs
Far End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs
Total (Previous Day):
Near End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 86435 Unavailable Secs

```

```

Far End
  0 CodeViolations, 0 ErrorSecs, 0 Severly Err Secs, 0 Unavailable Secs

STS-1 1, VTG 1, T1 1 (sts1e 0/3/0.1/1/1 T1) is down
timeslots: 1-4
FDL per AT&T 54016 spec.
Receiver is getting AIS.
Framing is ESF, Clock Source is Internal
Data in current interval (610 seconds elapsed):
  Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    609 Unavail Secs, 0 Stuffed Secs
  Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    0 Unavail Secs
Data in Interval 1:
  Near End
    0 Line Code Violations, 0 Path Code Violations
.....
  Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    0 Unavail Secs
Data in Interval 96:
  Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    900 Unavail Secs, 0 Stuffed Secs
  Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    0 Unavail Secs
Total Data (last 24 hours)
  Near End
    0 Line Code Violations,0 Path Code Violations,
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    86436 Unavail Secs, 0 Stuffed Secs
  Far End
    0 Line Code Violations,0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    0 Unavailable Secs
Total (Previous Day)
  Near End
    0 Line Code Violations,0 Path Code Violations,
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    86435 Unavail Secs, 0 Stuffed Secs
  Far End
    0 Line Code Violations,0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
    0 Unavailable Secs

```


STS-1 1, VTG 1, VT 2 (SONET 0/3/0.1/1/2 VT) is down
 VT Receiver has LP_AIS.

router#show controllers sts1e 0/3/0 tabular

Section/Line/Path same as previous.

sts1e 0/3/0.1 PATH is down.
 Hardware is NCS4200-1T8S-10CS

Applique type is VT1.5

STS-1 1, VTG 1, VT 1 (SONET 0/3/0.1/1/1 VT) is down
 VT Receiver has LP_AIS.
 cep is configured: FALSE cem_id (0)
 fwd_alarm_ais :0 fwd_alarm_rai :0, Clock Source is Internal
 BIP2-tca:6, BIP2-sf:3, BIP2-sd:6

Tx V5:2
 Rx V5:0
 Tx J2 Length=64
 TX J2 Trace Buffer:
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Expected J2 Length=64
 Expected J2 Trace Buffer:
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Rx J2 Length=16
 RX J2 Trace Buffer:
 CRC-7: 0x60 ERROR

 C9 79 F7 0F 5F D8 5D D2 D2 7C F6 0E 53 B2 0E 00 .y.._]...|..S...

INTERVAL	CV-V	ES-V	SES-V	UAS-V	CV-VFE	ES-VFE	SES-VFE	UAS-VFE
06:14-06:24	0	0	0	619	0	0	0	0
05:59-06:14	0	0	0	901	0	0	0	0
05:44-05:59	0	0	0	900	0	0	0	0
05:29-05:44	0	0	0	901	0	0	0	0
05:14-05:29	0	0	0	900	0	0	0	0
04:59-05:14	0	0	0	900	0	0	0	0
.....								
06:44-06:59	0	0	0	901	0	0	0	0
06:29-06:44	0	0	0	900	0	0	0	0
06:14-06:29	0	0	0	900	0	0	0	0
Total	0	0	0	86436	0	0	0	0
Total (Previous Day):								
05:29-05:29	0	0	0	86435	0	0	0	0

STS-1 1, VTG 1, T1 1 (SONET 0/3/0.1/1/1 T1) is down
 timeslots: 1-4
 FDL per AT&T 54016 spec.
 Receiver is getting AIS.
 Framing is ESF, Clock Source is Internal

Near End Data

INTERVAL	CV-L	ES-L	CV-P	ES-P	SES-P	CSS-P	SAS-P	UAS-P	FC-P
06:14-06:24	0	0	0	0	0	0	0	619	0
05:59-06:14	0	0	0	0	0	0	0	901	0

```

.....
06:44-06:59      0      0      0      0      0      0      0      901      0
06:29-06:44      0      0      0      0      0      0      900      0
06:14-06:29      0      0      0      0      0      0      900      0
Total            0      0      0      0      0      0      86436     0
Total (Previous Day):
05:29-05:29      0      0      0      0      0      0      86435     0
Far End Data
INTERVAL      ES-LFE  ES-PFE  SES-PFE  SEFS-PFE  CSS-PFE  UAS-PFE  FC-PFE
06:14-06:24      0      0      0      0      0      0      0
05:59-06:14      0      0      0      0      0      0      0
.....
06:29-06:44      0      0      0      0      0      0      0
06:14-06:29      0      0      0      0      0      0      0
Total            0      0      0      0      0      0      0
Total (Previous Day):
05:29-05:29      0      0      0      0      0      0      0

```

```

STS-1 1, VTG 1, VT 2 (SONET 0/3/0.1/1/2 VT) is down
VT Receiver has LP_AIS.
cep is configured: FALSE cem_id (0)
fwd_alarm_ais :0   fwd_alarm_rai :0, Clock Source is Internal

```

```
router#show controllers sts1e 0/3/0 remote performance
```

```
Section/Line/Path same as previous.
```

```
sts1e 0/3/0.1 PATH is down.
Hardware is NCS4200-1T8S-10CS
```

```

STS-1 1, VTG 1, VT 1 (VT1.5 1/1/1) - Remote Performance Data
Far end MIB Data:
Data in current interval (630 seconds elapsed)
0 CodeViolations , 0 ErrorSecs,0 Severly Err Secs, 0 Unavail Secs
FarEnd VT Interval data:
Total Data (last 96 15 minute intervals):
0 CodeViolations, 0 ErrorSec, 0 Severly Err Secs, 0 Unavail Secs

Total (Previous Day):
0 CodeViolations, 0 ErrorSec, 0 Severly Err Secs, 0 Unavail Secs

```

```

STS-1 1, VTG 1, T1 1 (SONET 0/3/0.1/1/1 T1) - Remote Performance Data
Data in current interval (630 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
0 Unavail Secs
Data in Interval 1:
.....
Data in Interval 96:
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
0 Unavail Secs
Total Data (last 24 hours)
0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
0 Unavail Secs
Total (Previous Day)
0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,

```

0 Errored Secs, 0 Bursty Err Secs, 0 Severly Err Secs
 0 Unavail Secs

STS-1 1, VTG 1, VT 2 (VT1.5 1/1/2) - Remote Performance Data
 Far end MIB Data:
 Data in curerent interval (630 seconds elapsed)
 0 CodeViolations , 0 ErrorSecs,0 Severly Err Secs, 0 Unavail Secs
 FarEnd VT Interval data:
 Total Data (last 96 15 minute intervals):
 0 CodeViolations, 0 ErrorSec, 0 Severly Err Secs, 0 Unavail Secs

 Total (Previous Day):
 0 CodeViolations, 0 ErrorSec, 0 Severly Err Secs, 0 Unavail Secs

router#show controllers stsl 0/3/0 remote performance tabular

Section/Line/Path same as previous.

stsl 0/3/0.1 PATH is down.
 Hardware is NCS4200-1T8S-10CS

STS-1 1, VTG 1, VT 1 (VT1.5 1/1/1) - Remote Performance Data
 Far end MIB Data:

INTERVAL	CV	ES	SES	UAS
06:14-06:24	0	0	0	0

 FarEnd VT Interval data:

INTERVAL	CV	ES	SES	UAS
05:59-06:14	0	0	0	0
05:44-05:59	0	0	0	0
05:29-05:44	0	0	0	0
05:14-05:29	0	0	0	0
.....				
06:29-06:44	0	0	0	0
06:14-06:29	0	0	0	0

 Total

CV	ES	SES	UAS	0	0	0	0
0	0	0	0	0	0	0	0

 Total (Previous Day)

CV	ES	SES	UAS	0	0	0	0
0	0	0	0	0	0	0	0

STS-1 1, VTG 1, T1 1 (SONET 0/3/0.1/1/1 T1) - Remote Performance Data

INTERVAL	LCV	PCV	CSS	SELS	LES	DM	ES	BES	SES	UAS
06:14-06:24	0	0	0	0	0	0	0	0	0	0
05:59-06:14	0	0	0	0	0	0	0	0	0	0
05:44-05:59	0	0	0	0	0	0	0	0	0	0
.....										
06:44-06:59	0	0	0	0	0	0	0	0	0	0
06:29-06:44	0	0	0	0	0	0	0	0	0	0
06:14-06:29	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Total (Previous Day)	0	0	0	0	0	0	0	0	0	0
05:29-05:29	0	0	0	0	0	0	0	0	0	0

STS-1 1, VTG 1, VT 2 (VT1.5 1/1/2) - Remote Performance Data
 Far end MIB Data:

INTERVAL	CV	ES	SES	UAS
----------	----	----	-----	-----

```
06:14-06:24      0      0      0      0
FarEnd VT Interval data:
INTERVAL      CV      ES      SES      UAS
05:59-06:14      0      0      0      0
```