



Cisco IOS Software Configuration for the 1-Port Channelized OC-12/STM-4 (OC-3) Line Card

This document describes the software configuration procedure for the 1-port channelized OC-12/STM-4 (OC-3) line card on the Cisco 12000 Series Router. This line card is sometimes referred to as the CHOC-12/STS3-IR-SC line card or the CHOC-12/STS3 line card.

Feature History for the 1-Port Channelized OC-12/STM-4 (OC-3) Line Card

Release	Modification
11.2(14)GS3	This feature was introduced.

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Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Corporate Headquarters:
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

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Prerequisites for the 1-Port Channelized OC-12/STM-4 (OC-3) Line Card

The Cisco 12000 Series Router must have at least one clock and scheduler card (CSC) installed that provides a one-quarter bandwidth to support the requirements of the 1-port channelized OC-12/STM-4 (OC-3) line card.

Information About the 1-Port Channelized OC-12/STM-4 (OC-3) Line Card

The 1-port channelized OC-12/STM-4 (OC-3) line card provides the Cisco 12000 Series Router with four ports of high-density STS-3/STM1 service through a single 622-Mbps OC-12/STM4 interface. The card interfaces with the Cisco 12000 Series Router switch fabric and provides one OC-12/STM4 duplex SC single-mode, intermediate-reach SONET/Synchronous Digital Hierarchy (SDH) connection.

How to Configure the 1-Port Channelized OC-12/STM-4 (OC-3) Line Card

The following sections provide information, with examples, for configuring and verifying the line card configuration.

- [Configuring the OC-12/STM4 Controller, page 2](#)
- [Configuring the STS-3/STM1 POS Interface, page 5](#)
- [Using show Commands to Check System Status, page 8](#)
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Configuring the OC-12/STM4 Controller

Use the **configure** command to configure the OC-12/STM4 controller. A Cisco 12000 Series Router identifies a controller by *slot/port*. For the 1-port channelized OC-12/STM-4 (OC-3) line card, port is always 0 and slot can be any one of the valid slot numbers (0 to 11, inclusive).

The following steps summarize a basic controller configuration for the 1-port channelized OC-12/STM-4 (OC-3) line card on a Cisco 12000 Series Router. Before using the **configure** command, you must enter the privileged level of the EXEC command interpreter with the **enable** command. The system prompts you for a password if one is set. Press **Return** after each configuration step, unless otherwise noted.

Step 1 Confirm that the system recognizes the card by entering the **show version** command:

```
Router# show version
```

For an example of output from the **show version** command, see the [“Using show Commands to Check System Status”](#) section on page 8.

Step 2 Check the status of each port by entering the **show interface** command:

```
Router# show interface
```

For an example of output from the **show interface** command, see the “[Using show Commands to Check System Status](#)” section on page 8.

Step 3 Enter configuration mode and specify that the console terminal will be the source of the configuration subcommands:

```
Router# configure terminal
Router(config)#
```

Step 4 In global configuration mode, enter the controller configuration mode by entering the **controller** command and specifying an OC-12/STM-4 interface, as follows:

```
Router(config)# controller SONET 1/0
Router(config-controller)#
```

Step 5 Set the clock source to line or internal:

```
Router(config-controller)# [no] clock source {line | internal}
```

Use the **no** form of this command to restore the default value, which is line.

Step 6 Change the OC-12/STM4 controller loopback mode:

```
Router(config-controller)# [no] loopback {line | internal}
```

Use the **no** form of this command to clear the loop setting.

Step 7 Change the S1S0 bit definition:

```
Router(config-controller)# [no] POS flag S1S0 <0-3>
```

Use the **no** form of this command to clear the loop setting.

The **no shutdown** command passes an **enable** command to the 1-port channelized OC-12/STM-4 (OC-3) line card. It also causes the line card to configure itself, based on the current configuration parameter values.

Step 8 Change the shutdown state to up and enable the controller:

```
Router(config-controller)# [no] shutdown
```

The **no shutdown** command passes an **enable** command to the 1-port channelized OC-12/STM-4 (OC-3) line card. It also causes the line card to configure itself based on the current configuration parameter values.

[Table 1](#) shows default values for an OC-12/STM4 controller configuration of a 1-port channelized OC-12/STM-4 (OC-3) line card in a Cisco 12000 Series Router.



Note

Scrambling on the OC-12/STM-4 controller is always enabled; it is not user-configurable.

Table 1 1-Port Channelized OC-12/STM-4 (OC-3) Line Card OC-12/STM4 Controller Configuration Default Values

Parameter	Configuration Command	Default Value
Alarm reporting	[no] POS report [b3-tca pais plop prdi]	b3-tca, plop
C2 byte	[no] POS flag C2 <0-255>	0x00
clock source	[no] clock source [internal line]	line
Cyclic redundancy check	[no] crc [16 32]	crc 16
keepalive	[no] keepalive <n>	10 sec
loopback	[no] loopback [internal line]	no loopback
Maximum transmission unit (MTU)	[no] mtu bytes	4470 bytes
Payload scrambling	[no] POS scramble-atm	no scrambling
POS framing	[no] POS framing [SDH SONET]	SONET
S1S0 bits	[no] POS flag S1S0 <0-3>	0
J0 byte	[no] POS flag J0 <0-255>	0xCC
Alarm reporting	[no] POS report [b1-tca b2-tca lais lrdi sd-ber sf-ber slof slos]	sf-ber, slos, slof , b1-tca, b2-tca
shutdown	[no] shutdown	no shutdown
thresholds	[no] POS threshold b1-tca <3-9> [no] POS threshold b2-tca <3-9> [no] POS threshold sd-ber <3-9> [no] POS threshold sf-ber <3-9>	b1-tca=6 b2-tca=6 sd-ber=6 sf-ber=3

OC-12/STM4 Controller Configuration Example

The following example shows a typical OC-12/STM4 controller configuration for the 1-port channelized OC-12/STM-4 (OC-3) line card:

```

Router>
Router> enable
Password:
Router#
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# controller sonet 1/0
Router(config-controller)# clock source line
Router(config-controller)# no loopback
Router(config-controller)# no shutdown
***** The next two lines are log messages on the console *****
%CONTROLLER-3-UPDOWN: controller sonet 1/0, changed state to up
Router(config-controller)#exit
Router(config)#exit
Router# %SYS-5-CONFIG_I: Configured from console by console
    
```

Verifying the Controller Configuration

To verify the above controller configuration, use the **show controllers EXEC** command, as in the following example:

```
Router# show controllers
.
<snip>
.
sonet      Show sonet controller state
.

Router# show controllers sonet 4/0
SONET4/0
SECTION
  LOF = 0          LOS = 0          BIP(B1) = 0
LINE
  AIS = 0          RDI = 0          FEBE = 0          BIP(B2) = 0

Active Defects:None
Active Alarms: None
Alarm reporting enabled for:SF SLOS SLOF B1-TCA B2-TCA

APS
  COAPS = 0        PSBF = 0
  State:PSBF_state = False
  ais_shut = FALSE
  Rx(K1/K2):00/00
  S1S0 = 00, C2 = 00

BER thresholds: SF = 10e-3  SD = 10e-6
TCA thresholds: B1 = 10e-6  B2 = 10e-6
```

Configuring the STS-3/STM1 POS Interface

After you verify the OC-12/STM4 controller configuration, you can configure the associated STS-3/STM1 POS interfaces. Be prepared with the information you will need, such as the interface IP addresses.

The following procedure is for creating a basic configuration—enabling an interface and specifying IP routing. You might also need to enter other configuration subcommands, depending on the requirements for your system configuration. For descriptions of configuration subcommands and the configuration options available, refer to the appropriate software publications listed in the [“Related Documents” section on page 14](#).

The router identifies an interface on the 1-port channelized OC-12/STM-4 (OC-3) line card by its chassis slot number, line card port number, and STS-3/STM1 channel number. The format is *slot/port:channel*. For example, the slot/port:channel# address of the first STS-3/STM1 serial interface on a 1-port channelized OC-12/STM-4 (OC-3) line card installed in line card slot 1 is *1/0:1*. The port number is always 0.

The current STS-3/STM1 channel configurable parameter settings are displayed in response to the **show int pos n/0:x** command.

Before using the **configure** command, you must enter the privileged level of the EXEC command interpreter with the **enable** command. The system prompts you for a password if one is set. Press **Return** after each configuration step unless otherwise noted.

Use the following procedure to configure the 1-port channelized OC-12/STM-4 (OC-3) line card:

- Step 1** Confirm that the system recognizes the card by entering the **show version** command:

```
Router# show version
```

For an example of output from the **show version** command, see the [“Using show Commands to Check System Status”](#) section on page 8.

- Step 2** Check the status of each port or channel by entering the **show interface** command:

```
Router# show interface
```

For an example of output from the **show interface** command, see the [“Using show Commands to Check System Status”](#) section on page 8.

- Step 3** Enter configuration mode and specify that the console terminal will be the source of the configuration subcommands:

```
Router# configure terminal
Router(config)#
```

- Step 4** In configuration mode, select an interface for configuration by entering the **interface pos** command:

```
Router(config)# interface pos slot/port:channel
```

- Step 5** In interface configuration mode, enable STS-3/STM1 payload scrambling by entering the **POS scramble-atm** configuration subcommand:

```
Router(config-if)# POS scramble-atm
Router(config)#
```

- Step 6** Assign an IP address and subnet mask to the interface with the **ip address** configuration subcommand:

```
Router(config-if)# ip address 10.1.2.3 255.0.0.0
```

- Step 7** Enable keepalive messages every <n> seconds:

```
Router(config-if)# keepalive <n>
```

Keepalive messages should be enabled on 1-port channelized OC-12/STM-4 (OC-3) interfaces.

- Step 8** Change the shutdown state to UP and enable the interface:

```
Router(config-if)# no shutdown
```

The **no shutdown** command passes a channel **enable** command to the 1-port channelized OC-12/STM-4 (OC-3) line card. It also causes the channel to configure itself based on the current configuration parameter values.

- Step 9** Add any other configuration subcommands required to enable routing protocols and adjust the interface characteristics.

- Step 10** When you have included all the configuration subcommands to complete the configuration, enter **^Z** (hold down the **Control** key while you press **Z**) to exit configuration mode.

- Step 11** Write the new configuration to memory:

```
Router# copy running-config startup-config
```

The system displays an OK message when the configuration is stored.

After you have completed your configuration, you can check it by using **show** commands. For an explanation of **show** commands, see the [“Using show Commands to Check System Status”](#) section on page 8.

STS-3/STM1 POS Interface on OC-12/STM4 Controller Configuration Example

The following example shows a typical STS-3/STM1 serial interface on the OC-12/STM-4 controller configuration for the 1-port channelized OC-12/STM-4 (OC-3) line card.

```
Router#
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config-if)# interface pos 1/0:1
Use the config-if mode to configure IP address and [no]shutdown.
Router(config-if)# ip addr 1.1.1.11 255.255.255.0
Router(config-if)
Router(config-if)# no scramble
Router(config-if)# keepalive 10
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# exit
Router#
```

Verifying the POS Interface Configuration

To verify the above interface configuration, use the **show interfaces** and **show controllers** commands, as in the following examples:

```
Router# show interfaces POS6/0:1
POS6/0:1 is up, line protocol is up
  Hardware is Packet over SONET
  Internet address is 12.1.1.2/24
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive not set
  Scramble disabled
  Last input 21:39:58, output 21:39:58, output hang never
  Last clearing of "show interface" counters 00:00:04
  Queueing strategy:fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
      0 parity
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 applique, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions

Router# show controller pos 6/0:1 details
POS6/0:1
PATH
  AIS = 0           RDI = 1           FEBE = 14         BIP(B3) = 42
  LOP = 0           NEWPTR = 2        PSE = 0           NSE = 0

Active Defects:None
```

```

Active Alarms: None
Alarm reporting enabled for:PLOP B3-TCA

PATH TRACE BUFFER :UNSTABLE
Remote hostname :
Remote interface:
Remote IP addr  :
Remote Rx(K1/K2): /      Tx(K1/K2): /

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

TCA thresholds: B3 = 10e-6
    
```

Using show Commands to Check System Status

Each Cisco 12000 Series Router line card maintains information about its configuration, traffic, errors, and so on. You can access this information by using the **show** commands. Following are descriptions and examples of the **show** commands.

- The **show interfaces** command output displays information about the system interfaces. Following is an example of the **show interface pos slot/port:channel#** command for channel 1 of a line card installed in slot 1. (Port is always 0 for the 1-port channelized OC-12/STM-4 (OC-3) line card.):

```

Router# show interface pos 4/0:1
POS4/0:1 is up, line protocol is up
  Hardware is Packet over SONET
  Internet address is 1.4.1.1/24
  MTU 4470 bytes, BW 155000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation HDLC, crc 16, loopback not set
  Keepalive not set
  Scramble enabled
  Last input 1d04h, output 00:00:08, output hang never
  Last clearing of "show interface" counters 1d01h
  Queueing strategy:fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
      0 parity
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  3255 packets output, 768580 bytes, 0 underruns
  0 output errors, 0 applique, 1 interface resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions
    
```

- To display information about an instance of an OC-12/STM4 controller as viewed from the route processor (RP) in the router, use the **show controllers SONET** command. Following is an example of the **show controllers SONET slot/port** command for a 1-port channelized OC-12/STM-4 (OC-3) line card:

```

Router# show controllers SONET
SONET6/0
SECTION
  LOF = 0          LOS = 0          BIP(B1) = 0
LINE
  AIS = 0          RDI = 0          FEBE = 0          BIP(B2) = 0
    
```

```
Active Defects:SD SLOF SLOS
Active Alarms: SLOS
Alarm reporting enabled for:SF SLOS SLOF B1-TCA B2-TCA
```

```
APS
COAPS = 0          PSBF = 0
State:PSBF_state = False
ais_shut = FALSE
Rx(K1/K2):00/00
S1S0 = 00, C2 = 00
```

```
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6
```

- Use the **show diag slot** command to see specific hardware information for a 1-port channelized OC-12/STM-4 (OC-3) line card installed in your system. Following is an example of the **show diag slot** command for an 1-port channelized OC-12/STM-4 (OC-3) line card installed in slot 1:

```
Router# show diags 6
SLOT 6 (RP/LC 6 ): 1 port SONET OC12 channelized to STS3 Single Mode
  MAIN: type 44, 800-4189-01 rev 72 dev 0
        HW config: 0x00 SW key: FF-FF-FF
  PCA: 73-3363-01 rev 80 ver 1
        HW version 1.1 S/N CAB021601SX
  MBUS: MBUS Agent (1) 73-2146-07 rev B0 dev 0
        HW version 1.2 S/N CAB021601SX
        Test hist: 0xFF RMA#: FF-FF-FF RMA hist: 0xFF
  DIAG: Test count: 0xFFFFFFFF Test results: 0xFFFFFFFF
  MBUS Agent Software version 01.35 (RAM) (ROM version is 01.33)
  Using CAN Bus A
  ROM Monitor version 00.0F
  Fabric Downloader version used 00.10 (ROM version is 00.10)
  Board is analyzed
  Board State is Line Card Enabled (IOS RUN )
  Insertion time: 00:00:11 (15:34:03 ago)
  DRAM size: 67108864 bytes
  FrFab SDRAM size: 33554432 bytes
  ToFab SDRAM size: 33554432 bytes
```

- Use the **show version** command to display the configuration of the system hardware (the number of each line card type installed), the Cisco IOS software version, the names and sources of configuration files, and the boot images. Following is an example of the **show version** command for a Cisco 12000 Series Router:

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) GS Software (GSR-P-M), Version 11.2(14)GS3, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-1998 by cisco Systems, Inc.
Compiled Fri 20-Nov-98 15:03
Image text-base:0x60010900, data-base:0x606C6000

ROM:System Bootstrap, Version 11.2(9)GS5, RELEASE SOFTWARE (fc1)
BOOTFLASH:GS Software (GSR-BOOT-M), Version 11.2(9)GS6, RELEASE SOFTWARE (fc1)

Router uptime is 1 day, 4 hours, 56 minutes
System returned to ROM by reload
System restarted at 11:50:58 EST Wed Nov 25 1998
System image file is "gsr-p-mz", booted via tftp from 172.32.8.14

cisco 12012/GRP (R5000) processor (revision 0x00) with 32768K bytes of memory.
R5000 processor, Implementation 35, Revision 2.1 (512KB Level 2 Cache)
Last reset from power-on
```

```

2 Clock Scheduler Card(s)
2 OC12 Channelized STS-3 POS controllers (8 POS).
1 Ethernet/IEEE 802.3 interface(s)
8 Packet over SONET network interface(s)
507K bytes of non-volatile configuration memory.

8192K bytes of Flash internal SIMM (Sector size 256K).
Configuration register is 0x0

```

- Use the **show protocols** command to display the global (system-wide) and interface-specific status of any configured Level 3 protocol.
- Use the **show running-config** command to display the currently running configuration in RAM as shown in the following example:

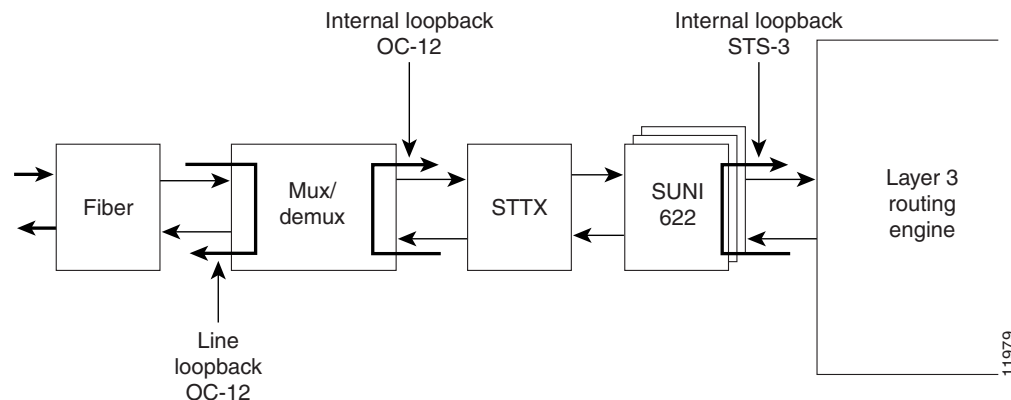
```

Router# show running-config
Building configuration...
Current configuration:
!
! No configuration change since last restart
!
version 11.2
no service pad
service timestamps log uptime
no service password-encryption
no service udp-small-servers
no service tcp-small-servers
!
hostname Router
!
enable secret 0 010100000011111100000/
enable password 1693482
!
ip host-routing
ip domain-name cisco.com
ip name-server 171.69.204.11
ip name-server 171.69.209.10
!
controller sonet 7/0
!
interface Serial7/0:1
 ip address 41.1.1.1 255.255.255.0
!
interface Serial7/0:2
 ip address 42.1.1.2 255.255.255.0
!
interface Serial7/0:3
 ip address 43.1.1.3 255.255.255.0
(Remainder of displayed text omitted from example)

```

Using Loopback Commands

The 1-port channelized OC-12/STM-4 (OC-3) line card supports loopback mode for the OC-12/STM-4 controller and for each of the associated STS-3/STM1 channels. [Figure 1](#) shows data flows for the various loopback modes.

Figure 1 Transmit and Receive Loopback Data Flows

OC-12/STM4 Controller Loopback Mode

The SONET controller supports two loopback modes, as shown in [Figure 1](#):

- **Internal**—In this loopback mode, data loops from the transmit path to the receive path at the mux/demux location on the line card, which allows the card running diagnostics to send data to itself at the OC-12/STM-4 level, without relying on external connections. Set the loopback mode to *internal*, using the `[no] loopback {internal | line}` controller configuration command, as in the following example:

```
Router(config-controller)# loopback internal
```

- **Line**—In this loopback mode, data loops from the receive path to the transmit path at the mux/demux location on the line card, and returns all data received at the OC-12/STM-4 level to the far end. In controller configuration mode, set the loopback mode to *line*, using the `[no] loopback {internal | line}` controller configuration command, as in the following example:

```
Router(config-controller)# loopback line
Router(config-controller)#
```

Use the **no** form of this command to restore the default value, which is no loopback.

STS3/STM1 POS Interface Loopback Mode

The POS interface supports an internal loopback mode for diagnostic purposes. In this loopback mode, data loops from the transmit path to the receive path for the affected POS interface, at the SONET/SDH Path level. This loopback occurs before the four STS-3/STM-1 streams are multiplexed/demultiplexed in the STTX block. (See [Figure 1](#).) This mode allows a single POS interface to be taken out of service for internal loopback testing.

In the POS interface configuration mode, set the internal loopback mode using the `[no] loopback internal` configuration subcommand, as in the following example:

```
Router(config)# interface pos 4/0:1
Router(config-if)# loopback internal
```

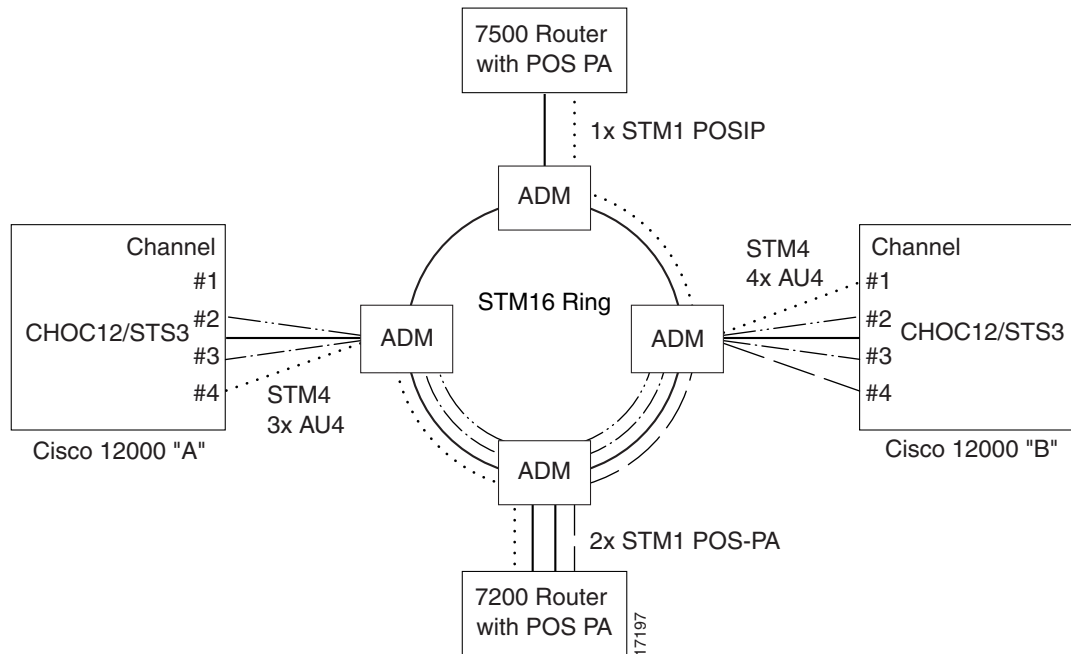
Use the **no** form of this command to restore the default value, which is no loopback.

Configuration Examples for the 1-Port Channelized OC-12/STM-4 (OC-3) Line Card

This section describes configuration examples that use the 1-port channelized OC-12/STM-4 (OC-3) line card. Figure 2 shows a possible deployment of the 1-port channelized OC-12/STM-4 (OC-3) in a network with four Cisco routers connected on an SDH STM-16 ring with Add Drop Multiplexers (ADMs). The ADMs provide the clock source in this configuration. If you do not see the local router set to **clock source internal**, then the remote side is set to the default **clock source line**.

In the following examples, Cisco 12000 Series Router “A” contains a 1-port channelized OC-12/STM-4 (OC-3) line card in slot 1. Channel 1 of this card is unused. Channels 2 and 3 are connected to channels 2 and 3 of a 1-port channelized OC-12/STM-4 (OC-3) line card in router “B”. Channel 4 of the 1-port channelized OC-12/STM-4 (OC-3) line card in router “A” is connected to an STM1 POS-PA in a Cisco 7200 Series Router. Channels 2 and 3 share a common IP address through the use of an IP unnumbered interface specification and load share on a per-packet basis.

Figure 2 1-Port Channelized OC-12/STM-4 (OC-3) Line Card Interoperability Diagram



The following configuration is for channels 2 and 3 on the 1-port channelized OC-12/STM-4 (OC-3) line card on Cisco 12000 “A”, shown in Figure 2:

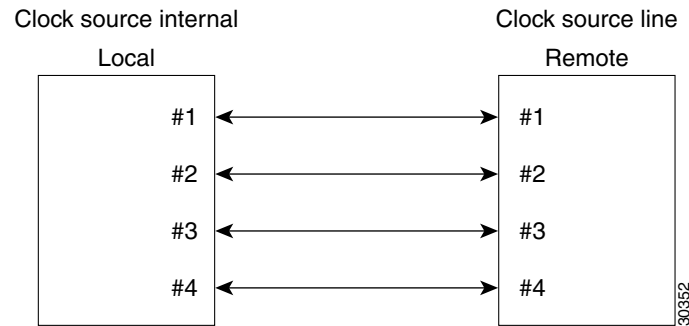
```

Router# configure terminal
Router(config)# interface pos 1/0:2
Router(config-if)# ip address 1.1.1.1 255.255.255.0
Router(config-if)# keepalive 10
Router(config-if)# crc 16
Router(config-if)# ip load-sharing per-packet
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# interface pos 1/0:3
Router(config-if)# ip unnumbered pos 1/0:2
Router(config-if)# keepalive 10
Router(config-if)# crc 16
    
```

```
Router(config-if)# ip load-sharing per-packet
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# end
```

For evaluation purposes, you can configure the 1-port channelized OC-12/STM-4 (OC-3) back-to-back as depicted in Figure 3. In this configuration, 1-port channelized OC-12/STM-4 (OC-3) functionality and features can be validated without ADM in between. Set the local clock source to internal and set the remote clock source to line (or reversed), as shown in Figure 3. If you can pass packets properly in a back-to-back configuration, you can expect them to operate properly with the ADM.

Figure 3 1-Port Channelized OC-12/STM-4 (OC-3) Line Cards in Back-to-Back Configuration



```
Router# configure terminal
Router(config)# interface pos 1/0:2
Router(config-if)# ip address 1.1.1.1 255.255.255.0
Router(config-if)# keepalive 10
Router(config-if)# crc 16
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# interface pos 1/0:3
Router(config-if)# ip unnumbered pos 1/0:2
Router(config-if)# ip load-sharing per-packet
Router(config-if)# keepalive 10
Router(config-if)# crc 16
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# end
```

Additional References

The following sections provide references related to the 1-port channelized OC-12/STM-4 (OC-3) line card.

Related Documents

Related Topic	Document Title
Hardware installation	<i>Channelized and Electrical Interface Line Card Installation and Configuration</i>
Software configuration commands	<ul style="list-style-type: none"> • <i>Software Configuration Guide for the Cisco 12000 Series Internet Router</i> • <i>Cisco IOS Configuration Fundamentals Configuration Guide</i> • <i>Cisco IOS Release 12.0S Release Notes for Cisco 12000 Series Internet Routers</i>

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

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