



Multiple Origination Point Code Support for the Cisco Signaling Link Terminal

This document describes multiple Signaling System 7 (SS7) point code (PC) support for the Cisco Signaling Link Terminal (Cisco SLT) in Cisco IOS Release 12.2(15)T. This feature allows Cisco SLTs to access multiple SS7 PCs on a Media Gateway Controller (MGC). PCs are an addressing scheme used by SS7. Each SS7 message signal unit (MSU) contains an origination point code (OPC) that identifies the source of the MSU.

This feature uses multiple SS7 session sets to support multiple PCs at an MGC, more precisely, to support multiple concurrent active Reliable User Datagram Protocol (RUDP) sessions at a Cisco SLT. The RUDP sessions within an SS7 session set are bound to the same PC at its respective MGCs. SS7 links are associated with SS7 session sets so that messages received from the public switched telephone network (PSTN) on a given link are forwarded to the MGC over the correct SS7 session set or active RUDP session. All RUDP sessions in an SS7 session set represent redundant connections for a single PC.

Benefits of this feature include the following:

- Expanded provisioning—This feature allows you to provision more than a single PC per Cisco SLT, allowing you to provision more than one active RUDP session to an MGC. The Cisco SLT terminates only the first two layers of the SS7 protocol stack.
- Support for active sessions on multiple MGCs—A Cisco SLT is now capable of supporting active sessions to more than one MGC.
- Support for Cisco SLT backhaul—This feature allows Cisco SLTs to backhaul messages to and from multiple PCs at the same MGC.
- Support for SS7 session sets:
 - A Cisco SLT supports up to four SS7 session sets.
 - Each SS7 session set contains zero to four RUDP sessions.
- Independent RUDP session recovery capabilities:
 - A Cisco SLT can support up to 16 RUDP sessions.
 - Each RUDP session belongs to only one SS7 session set.
- SS7 link capabilities:
 - Each SS7 link belongs to one SS7 session set.
 - Messages for any link are relayed to and from the active RUDP session of the link's associated SS7 session set.

Feature Specifications for the Multiple OPC Support for the Cisco Signaling Link Terminal Feature

Feature History

Release	Modification
12.2(15)T	This feature was introduced.

Supported Platforms

Cisco 2611, Cisco 2651, Cisco AS5350, and Cisco AS5400 Cisco SLT platforms.

Finding Support Information for Platforms and Cisco IOS Software Images

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.

Contents

- [Restrictions, page 2](#)
- [Information About Multiple OPC Support for the Cisco Signaling Link Terminal, page 3](#)
- [How to Configure Multiple OPC Support for the Cisco Signaling Link Terminal, page 11](#)
- [Configuration Examples for Multiple OPC Support for the Cisco Signaling Link Terminal, page 16](#)
- [Additional References, page 18](#)
- [Command Reference, page 20](#)
- [Glossary, page 33](#)

Restrictions

- The Multiple OPC Support for the Cisco Signaling Link Terminal feature can run on only Cisco 2611, and Cisco 2651 SLTs, Cisco AS5350, and Cisco AS5400 SLTs.
- The Cisco SLT requires a minimum of 64 MB of DRAM beginning with Cisco IOS Release 12.2(15)T and later releases.
- The 56-K WAN interface card (WIC) with integrated CSU and data service unit (DSU), which is currently available with Cisco SLTs for the Cisco 2600 platforms, are not available with the *Integrated Signaling Link Terminal* feature on the Cisco AS5350 and Cisco AS5400 platforms:

The following RUDP restrictions apply to the Multiple OPC Support for the Cisco Signaling Link Terminal feature:

- RUDP sessions within the same SS7 session set follow the same restrictions that existed prior to this feature: No more than two sessions can connect to the same MGC, and no more than two different MGCs can be accessed.
- Two RUDP sessions from the same SS7 session set can connect to the same MGC only if the following occurs:
 - The two RUDP sessions are configured to use different Ethernet interfaces on the Cisco SLT (thus requiring the Cisco SLT to have two Ethernet network interface cards or NICs).
 - The MGC is running PGW2200 Version 9.2(2) or.

Information About Multiple OPC Support for the Cisco Signaling Link Terminal

To configure the Multiple OPC Support for the Cisco Signaling Link Terminal feature, you must first understand the following concepts:

- [Cisco Signaling Link Terminal, page 3](#)
- [RUDP Session Concepts, page 4](#)
- [SS7 Session Set Concepts, page 4](#)
- [MGC Session Manager Capabilities, page 8](#)
- [Point Code Functionality, page 8](#)
- [Multiple Point Code Support, page 9](#)

Cisco Signaling Link Terminal

The Cisco SLT functions as an SS7 front-end processor for the Cisco PGW2200 node. The Cisco SLT is responsible for terminating the Message Transfer Part Level 1 (MTP1) and MTP2 layers of the SS7 protocol stack. The Cisco SLT transports the upper layers of the SS7 signaling (MTP3 and above) to and from the MGC over an IP network using the RUDP protocol. For redundancy, this feature allows the Cisco SLT to connect to multiple MGCs (up to two), one as active and the other as standby.

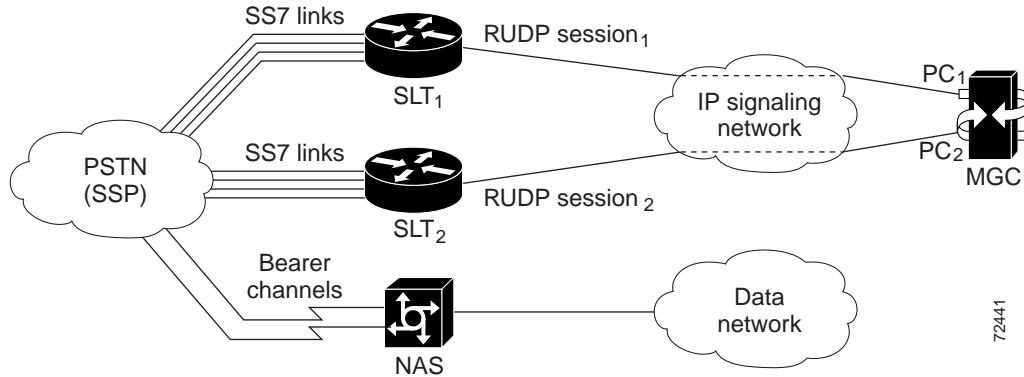
The Cisco 2611 or Cisco 2651 routers, and the Cisco AS5350 or Cisco AS5400 universal gateways can function as a Cisco SLT. The Cisco 2600-based Cisco SLTs can be configured with up to two WICs to terminate the SS7 MTP2 protocol arriving on up to four SS7 digital or serial links (the Cisco 2611-based Cisco SLT allows only two links). The Cisco AS5350 or Cisco AS5400 can be configured using the 2-, 4-, or 8-PRI dial feature card (DFC) or the CT3 (28-PRI) DFC card to terminate the SS7 MTP2 protocol arriving on up to four SS7 digital links.

SS7 links are identified by a unique integer called the channel ID. The channel ID is included in each backhaul message between the Cisco SLT and the MGC. In this way, when the Cisco SLT receives a message from the MGC, it knows one of its SS7 links to forward the message. Channel IDs are implicitly assigned on Cisco 2600-based Cisco SLTs depending on the slot and port of the WIC that supports the link's physical interface. For improved scalability, the Cisco AS5350- and Cisco AS5400-based Cisco SLTs introduced a new **channel id** command to let provisioners directly associate a channel ID value with an SS7 link. For more information about the **channel id** command, refer to the [Integrated Signaling Link Terminal](#) feature on Cisco.com.

Prior to this feature, the Cisco SLT could support only a single RUDP session to each MGC in its signaling network. A Cisco SLT supported only a maximum of four SS7 links to a service switching point (SSP). Independently, a Cisco SLT supported up to four RUDP sessions, also called SS7 sessions. Each SS7 session represented a backhaul connection to a different MGC. Only one session was active at any moment, and the others were in standby mode.

[Figure 1](#) illustrates the old network topology. The figure is simplified to emphasize PC restriction and shows that a network access server (NAS) can be combined with one of the Cisco SLTs into a single Cisco AS5350 or Cisco AS5400 platform using the integrated Cisco SLT feature. Up to three additional RUDP sessions can be supported by each Cisco SLT to other (standby) MGCs for redundancy.

Figure 1 Single Point Code Architecture



Having multiple Cisco SLTs was the only way for a PSTN to address multiple point codes at an MGC. This concept was independent of the restriction of only a single active RUDP session for a given MGC.

With the Multiple OPC Support for the Cisco Signaling Link Terminal feature, the multiple SS7 link support is added to increase signaling bandwidth (each link is nominally restricted to 56 or 64 kbps based on the SS7 standard, yet the RUDP session can handle up to 100 Mbps depending on IP network equipment).

RUDP Session Concepts

This feature extends the current single instance of an SS7 session set on each Cisco SLT to multiple SS7 session sets, each having its own collection of sessions and SS7 links, with one session from each collection being active. New command-line interface (CLI) commands have been added to associate RUDP sessions and SS7 links with an SS7 session set. All the SS7 links that belong to an SS7 session set are multiplexed over the SS7 session set's currently active RUDP session.

Because Cisco SLTs can currently support no more than four SS7 links (except for the Cisco 2611-based Cisco SLT, which allows only two SS7 links), only four SS7 session sets are implicitly allowed. The number of RUDP sessions needed has been increased from four to sixteen.

RUDP sessions within an SS7 session set are used for redundancy. These sessions represent the RUDP-to-IP connections from a Cisco SLT to the MGCs in the MGC signaling network. Each RUDP session within an SS7 session set must connect to a unique MGC. Only one RUDP session per SS7 session set is active at any moment. The others are standby and are capable of taking over backhaul messaging traffic if the active session fails.

Multiple SS7 links are used for improved signaling throughput. These links are established between the PSTN and the Cisco SLT. All configured links can concurrently support signaling traffic.

SS7 Session Set Concepts

To allow multiple RUDP sessions on the same MGC, this feature introduces a new concept called the SS7 session set. An SS7 session set is not explicitly defined; rather four SS7 session sets implicitly exist with the IDs 0 to 3. New CLI options allow you to add any subset of RUDP sessions to an SS7 session set with the restriction that no session can belong to more than one SS7 session set (that is, the SS7 session sets act as a partition of the RUDP sessions).

By default, all sessions are in SS7 session set 0. The collection of sessions in an SS7 session set supports the active and standby concept: One session in each SS7 session set is active and the others are standby, and the session manager logic dynamically decides which session in an SS7 session set is currently active. SS7 session sets with no sessions are also allowed.

To continue to allow up to four RUDP sessions per SS7 session set, this feature increases the number of configurable RUDP sessions on a Cisco SLT from four to sixteen.

Figure 2 illustrates multiple PC architecture using the simplest multiple SS7 session set configuration. In this example, the Cisco SLT is configured as follows:

- Two RUDP sessions (0 and 1)—Session 0 belongs to SS7 session set 0, and session 1 belongs to SS7 session set 1. The use of two SS7 session sets allows the PSTN to access two point codes (PCa and PCb) at the (single) MGC.
- SS7 session sets 2 and 3 (not shown) are unused and have no sessions.
- Four SS7 links:
 - Link 0 and link 2 are associated with SS7 session set 0; their SS7 messages are multiplexed over SS7 session set 0's active RUDP session (in this case, session 0).
 - Link 1 and link 3 are associated with SS7 session set 1.

Figure 2 Multiple Point Code Architecture with Simplest Multiple SS7 Session Sets Configured

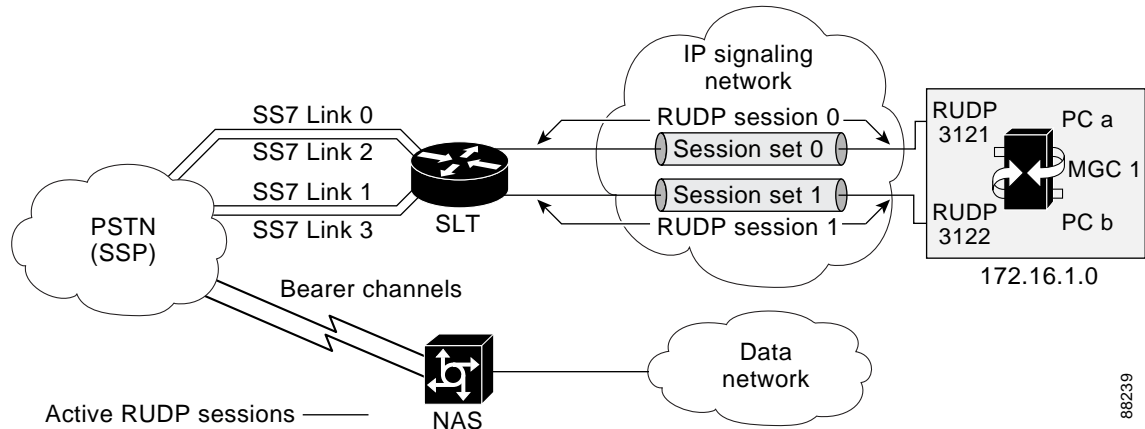


Figure 3 shows a typical SS7 session set configuration. In this example, the Cisco SLT is configured as follows:

- Two MGCs for redundancy
- A single Cisco SLT with four RUDP sessions (0 to 3)
- Four SS7 links (0 to 3)
- Two SS7 session sets (0 or 1)



Note

In this example, the PSTN should use SS7 links 0 or 2 to access PC a. These links are serviced by MGC 1, because the active SS7 session for those links is session 0. The PSTN should use SS7 links 1 or 3 to access PC b. These links are also serviced by MGC1, because the active RUDP session for those links is session 2.

If either SS7 session 0 or 2 fail, session manager logic on the Cisco SLT automatically switches to the standby sessions in their respective SS7 session sets, in this case, to sessions 1 and 3, respectively, and then to MGC2. If this happened, the PSTN would not know that such recovery took place, and it would continue to use its four SS7 links without change.

Figure 3 Typical SS7 Session Set Configuration

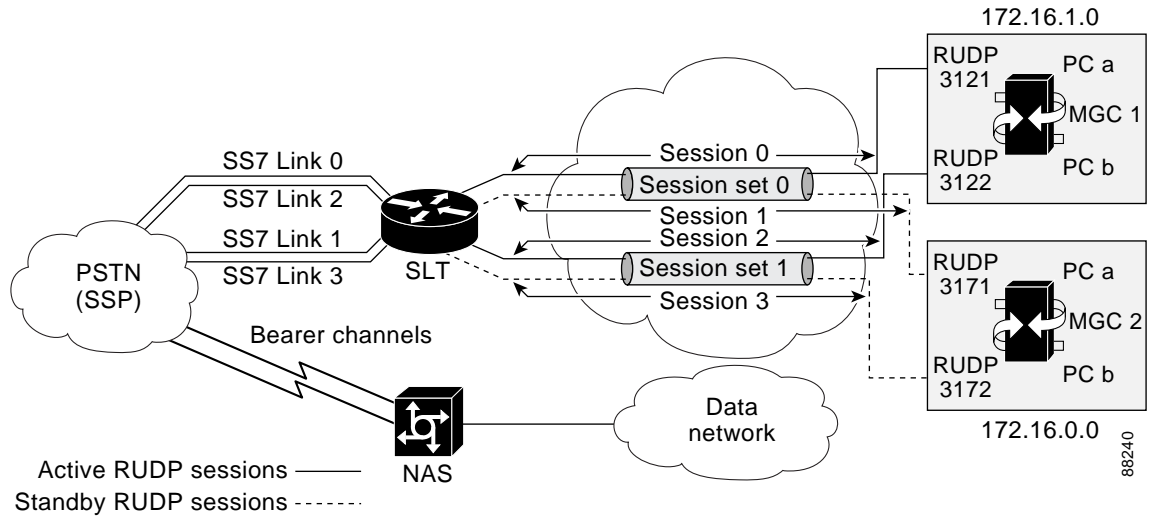


Figure 4 illustrates multiple PC architecture using the maximum SS7 resources allowed on a single Cisco SLT. In this example, the Cisco SLT is configured as follows:

- Single Cisco SLT
- Multiple MGCs for redundancy
- Four SS7 links
- Four SS7 session sets
- 16 RUDP sessions.

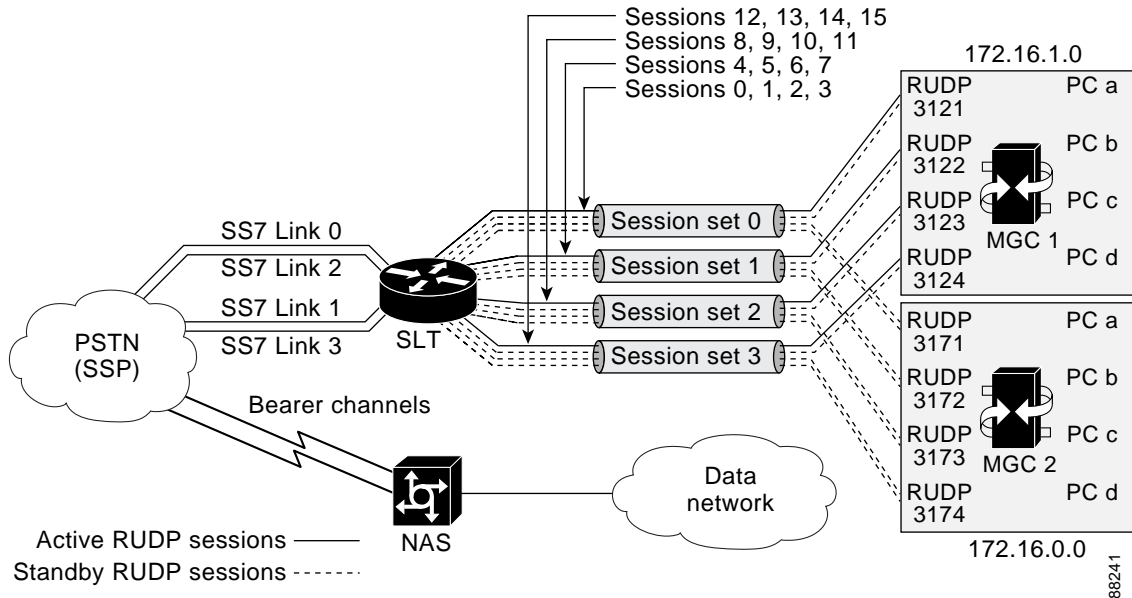
All RUDP sessions in the same SS7 session set represent the same PC even though (as in this case) they connect to two different MGCs. Using four RUDP sessions in a single SS7 session set requires that two of the sessions go to one MGC and the other two to a second MGC (because only two MGCs can be used in a redundant configuration). In this case, the Cisco SLT is required to have two separate Ethernet interfaces.



Note

In this maximum usage case, each SS7 session set supports one SS7 link. The use of four RUDP sessions per SS7 session set is for maximum redundancy. The four SS7 session sets are configured to access four separate point codes (in this case, PC a through PC d).

Figure 4 Multiple Point Code Architecture with Maximum RUDP Session Redundancy



MGC Session Manager Capabilities

Only one RUDP session in an SS7 session set may be active at any moment. All other RUDP sessions must be in standby mode. MGC session manager logic decides and enforces which RUDP session is active in each SS7 session set.

If the active RUDP session fails in any SS7 session set, the MGC session manager logic attempts to switch to a standby session in the same SS7 session set, if one is present. Such recovery is performed independently for each SS7 session set; the active session in two different SS7 session sets is allowed to connect to two different MGCs.

When deciding which RUDP session in an SS7 session set is to be active, the MGC session manager selects the session with the lowest identification index. In this way you can control the likelihood that all active links connect to the same MGC by having the lowest indexed session in each SS7 session set connect to the same MGC, the second lowest pointing to another MGC, and so on.

Point Code Functionality

Each signaling point (also called an SS7 node or SP) in the SS7 network is identified with a unique address called a point code (PC). ANSI PCs are 24-bit, and ITU-T PCs are 14-bit. PCs are carried in signaling messages exchanged between signaling points to identify the source and destination of each message. PCs are managed by the government agency that supervises, licenses, and controls electronic and electromagnetic transmission standards in your country. Note that there could be two separate agencies managing policy and providing licenses in your country.



Note

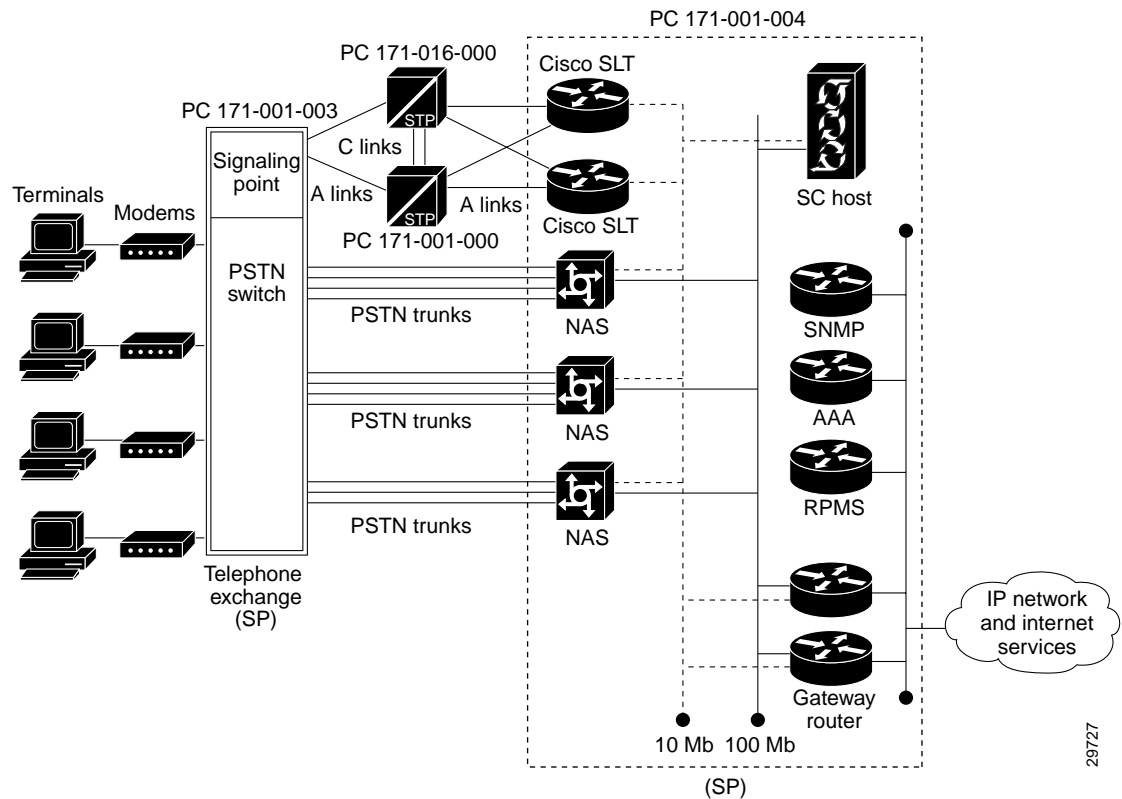
When using signal transfer points (STPs), multiple signaling links between the same nodes (point-to-point) share traffic and are referred to as link sets.

The PC is a hierarchical address that consists of the following:

- Network identification—Identifies a signaling network.
- Network cluster—Identifies a cluster of nodes that belong to a signaling network. For example, you can address a group of nodes by using the same mated pair of STPs as a network cluster.
- Network cluster member—Identifies a single signaling point within a cluster.

Figure 5 shows PCs configured in the SS7 network.

Figure 5 Point Codes in the SS7 Network



For more information about PCs and the SS7 network, refer to the “[SS7 Technology Overview](#)” section in the [Cisco SS7 Interconnect for Access Servers Solution Release 2.2](#) document on Cisco.com.

Multiple Point Code Support

This feature allows a Cisco SLT to access multiple PCs at any of its MGCs. For backward compatibility, the multiple PC Cisco SLT supports the following features:

- SS7 A-link termination on a T1, E1, or V.3512-in-1 serial line interface
- SS7 F-link termination on a T1 or E1 link, including the drop and insert feature
- SS7 MTP1
- SS7 MTP2
- ITU-T MTP2

- Bellcore MTP2
- NTT MTP2
- TTC MTP2
- MTP2 layer Operation, Administration, and Maintenance (OAM)
- Backhaul protocol Version 0 for the interface between MTP2 and MTP3 on the MGC
- Reliable UDP (RUDP) for backhauling protocol data units (PDUs) between the integrated Cisco SLT and the MGC
- Session manager for backhaul configuration and control

Figure 6 shows the analog version of multiple PC architecture on a Cisco SLT configured with the following:

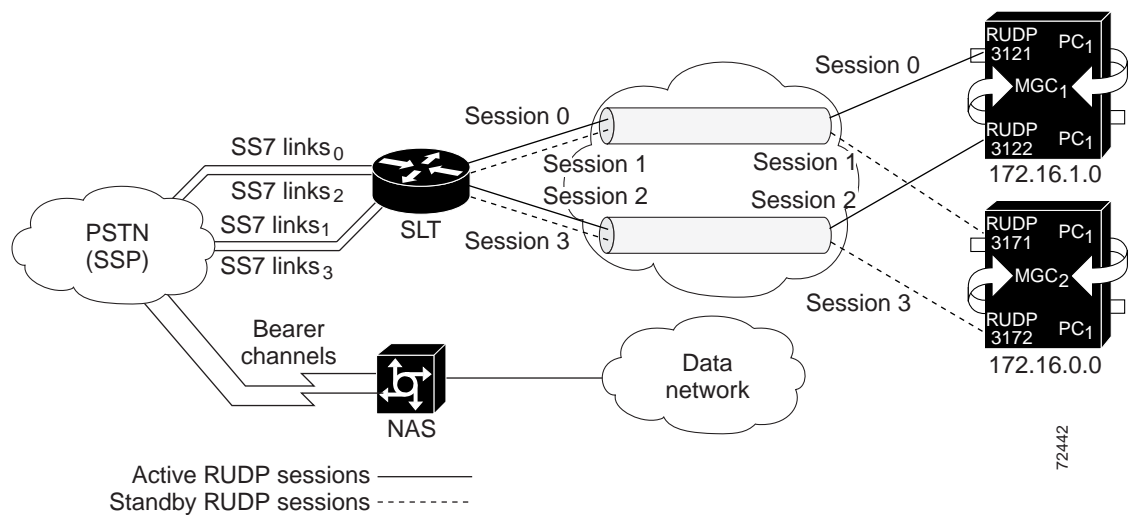
- Four RUDP sessions (0 to 3):
 - Sessions 0 and 1 belong to SS7 session set 0.
 - Sessions 2 and 3 to SS7 session set 1.
 - SS7 session sets 2 and 3 (not shown) are unused and have no sessions.
- Four SS7 links:
 - Link 0 and link 2 are associated with SS7 session set 0, which indicates that their SS7 messages are multiplexed over SS7 session set 0's active RUDP session (in this case, session 0).
 - Link 1 and link 3 are associated with SS7 session set 1.



Note

Redundancy is achieved by using redundant RUDP sessions connected to different MGCs and by redundant RUDP sessions connected to the same MGC.

Figure 6 Multiple Point Code Architecture on a Cisco SLT



How to Configure Multiple OPC Support for the Cisco Signaling Link Terminal

This section contains the following procedures and tips:

- [Adding Multiple OPCs, page 11](#)
- [Configuring Session-to-SS7-Session-Set Association, page 12](#)
- [Configuring the SS7 Session Set Failover Timer, page 13](#)
- [Configuring the SS7-Link-to-SS7-Session-Set Association on Cisco AS5350 and Cisco AS5400 SLTs, page 14](#)
- [Configuring the SS7-Link-to-SS7-Session-Set Association on Cisco 2600-Based SLTs, page 15](#)
- [Troubleshooting Tips, page 16](#)

Adding Multiple OPCs

Depending on your system configuration, you may have to assign more than one OPC to a single MGC. When adding multiple OPCs, keep the following information in mind:

- ITU point codes contain 14 bits and ANSI point codes contain 24 bits.



Note Use care when supplying ITU point codes since they are not checked in the provisioning session.

- A maximum of 6 true OPCs can be supported per MGC.
- For each OPC added, you must specify a different local port number for each C7 IP link on the same interface.
- For each OPC added, you must create a duplicate DPC with a different name but with the same IP address.
- Each OPC must have a unique network address.
- Enter the OPC before creating the C7 IP link.
- When specifying a local port number, it must be greater than 1024 (for example, 7000).
- Each OPC requires its own linkset (a linkset cannot be shared by 2 OPCs).
- A maximum of 2 Session Manager sessions (1 active and 1 standby) can be supported per SLT (1 session per link).
- A maximum of 32 links can be supported per Control Channel.
- A maximum of 16 linksets can be included per Control Channel.
- A maximum of 4,096 DS0s (CICs) can be supported per OPC-DPC pair for ITU or a maximum of 16,384 DS0s (CICs) for ANSI.



Note

You must provision one session set in the PGW for each OPC that will be used in the Cisco SLT. For information on how to provision the PGW for multiple OPCs, refer to the [Adding Multiple OPCs](#) section of [Chapter 5, Adding Components with MML](#) in the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

Configuring Session-to-SS7-Session-Set Association

Use the steps in this section to assign a session to an SS7 session set.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ss7 session** *session-id* **address** *destination-address destination-port local-address local-port session-set session-set-id*
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	ss7 session <i>session-id</i> address <i>destination-address destination port local-address local-port session-set session-set-id</i> Example: Router(config)# ss7 session 0 address 172.16.1.0 7000 172.16.0.0 7000 session-set 5	Assigns a session to an SS7 session set. <ul style="list-style-type: none"> • If the optional session-set keyword is omitted, the command is applied to SS7 session set 0, which is the default.
Step 4	exit Example: Router(config)# exit	Exits global configuration mode and completes the configuration.

Configuring the SS7 Session Set Failover Timer

Use the steps in this section to independently select values for the failover-timer for each SS7 session set.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ss7 set [session-set *session-set-id*] failover-timer *ft-value***
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	ss7 set [session-set <i>session-set-id</i>] failover-timer <i>ft-value</i> Example: Router(config)# ss7 set session-set 3 failover-timer 5	Specifies the amount of time that the SS7 session manager waits for the active session to recover or for the standby MGC to indicate that the Cisco SLT should switch traffic to the standby session. • If you do not use the session-set and <i>session-set-id</i> keyword and argument, the command is applied to SS7 session set 0, which is the default.
Step 4	exit Example: Router(config)# exit	Exits global configuration mode and completes the configuration.

Configuring the SS7-Link-to-SS7-Session-Set Association on Cisco AS5350 and Cisco AS5400 SLTs

Use the steps in this section to assign an SS7 link to an SS7 session set on a Cisco AS5350 or Cisco AS5400 SLT.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface serial** *slot/port:timeslot*
4. **controller t1** *slot/port*
5. **channel-group** *channel-group-number timeslot number*
6. **exit**
7. **interface serial** *slot/port:timeslot*
8. **channel-id** *channel-id* [**session-set** *session-set-id*]
9. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none">• Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface serial <i>slot/port:timeslot</i> Example: Router# interface serial 0:0/15	Specifies a serial interface created on a channelized E1 or channelized T1 controller (for ISDN PRI, channel-associated signalling, or robbed-bit signalling). <ul style="list-style-type: none">• For more information about the interface serial command, refer to the “interface serial” command reference in the Cisco IOS Dial Technologies Command Reference, Release 12.2 on Cisco.com.
Step 4	controller t1 <i>slot/port</i> Example: Router(config)# controller t1 5/7	Enters config-controller configuration mode on the T1 controller on the selected slot and port.

	Command or Action	Purpose
Step 5	<pre>channel-group channel-group-number timeslots timeslot-range</pre> <p>Example: Router(config-controller)# channel-group 0 timeslots 1</p>	<p>Assigns and configures an EtherChannel interface to an EtherChannel group.</p> <ul style="list-style-type: none"> The timeslots keyword defines the time slots of each T1 or E1 circuit. Valid time slot ranges can be one of the following: <ul style="list-style-type: none"> T1—1-24 E1—1-31 For more information about the channel-group command, refer to the “channel-group” command reference in the <i>Cisco IOS Dial Technologies Command Reference</i>, Release 12.2 on Cisco.com.
Step 6	<pre>exit</pre> <p>Example: Router(config-controller)# exit</p>	<p>Exits config-controller mode and returns to global configuration mode.</p>
Step 7	<pre>interface serial slot/port:timeslot</pre> <p>Example: Router(config)# interface serial 5/7:0</p>	<p>Specifies a serial interface created on a channelized E1 or channelized T1 controller (for ISDN PRI, channel-associated signalling, or robbed-bit signalling).</p> <ul style="list-style-type: none"> For more information about the interface serial command, refer to the “interface serial” command reference in the <i>Cisco IOS Dial Technologies Command Reference</i>, Release 12.2 on Cisco.com.
Step 8	<pre>channel-id channel-id [session-set session-set-id]</pre> <p>Example: Router(config)# channel-id 0 session-set 1</p>	<p>Assigns a session channel ID to an SS7 serial link.</p>
Step 9	<pre>exit</pre> <p>Example: Router(config)# exit</p>	<p>Exits global configuration mode and completes the configuration.</p>

Configuring the SS7-Link-to-SS7-Session-Set Association on Cisco 2600-Based SLTs

The Cisco 2600-based SLTs do not support the **channel-id** command to assign an SS7 link to an SS7 session set, so you must implicitly assign an SS7 link on the basis of the slot location of the WIC and the channel-group ID used to create the SS7 link.

Use the steps in this section to assign a link to an SS7 session set on the Cisco 2600-based SLT.

SUMMARY STEPS

1. **enable**
2. **configure terminal**

3. **session-set** *session-set-id*
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>enable</code> Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	<code>configure terminal</code> Example: Router# configure terminal	Enters global configuration mode.
Step 3	<code>session-set session-set-id</code> Example: Router(config)# session-set 1	Associates an SS7-link-to-SS7-session-set on the Cisco 2600-based SLT.
Step 4	<code>exit</code> Example: Router(config)# exit	Exits global configuration and completes the configuration.

Troubleshooting Tips

- Enter the **show ss7 sm set** command in privileged EXEC mode to display the SS7 session set state, failover timer, member sessions, and SS7 links that belong to an SS7 session set or range of SS7 session sets.
- Enter the **show ss7 mtp1 links** command in privileged EXEC mode to display the interface, type (serial or digital), SCC port, state (started or stopped), channel ID, and SS7 session set information for all configured SS7 links.

Configuration Examples for Multiple OPC Support for the Cisco Signaling Link Terminal

This section provides the following configuration examples:

- [Session-to-SS7-Session-Set Association Example, page 17](#)
- [SS7 Session Set Failover Timer Example, page 17](#)
- [SS7-Link-to-SS7-Session-Set Association on Cisco AS5350 and Cisco AS5400 SLTs Example, page 17](#)
- [SS7-Link-to-SS7-Session-Set Association on Cisco 2600-Based SLTs Example, page 17](#)
- [Verifying SS7 Links Example, page 17](#)

Session-to-SS7-Session-Set Association Example

The following example associates RUDP session 0 with SS7 session set 2:

```
Router(config)# ss7 session 0 address 172.16.1.0 7000 172.16.0.0 7000
session-set 2
```

SS7 Session Set Failover Timer Example

The following example sets the failover timer to 4 seconds for SS7 session set 1:

```
Router(config)# ss7 set session-set 1 failover-timer 4
```

SS7-Link-to-SS7-Session-Set Association on Cisco AS5350 and Cisco AS5400 SLTs Example

The following example assigns a session channel ID to an SS7 serial link on a Cisco AS5350 or Cisco AS5400. In this example, the channel ID is 0 and the SS7 session set ID is 1:

```
Router(config-if)# channel-id 0 session-set 1
```

SS7-Link-to-SS7-Session-Set Association on Cisco 2600-Based SLTs Example

The following example creates an SS7-link-to-SS7-session-set association on the Cisco 2600-based Cisco SLT:

```
Router(config)# session-set 1
```

Verifying SS7 Links Example

The following example displays the interface, type, SCC port, state, channel ID, and SS7 session set for all configured SS7 links on a Cisco AS5350 or Cisco AS5400:

```
Router# show ss7 mtp1 links
```

```
SS7 MTP1 Links [num = 4, platform max = 4]:
```

interface	type	SCC	state	session channel	session set
7/0:0	digital	7/3	STARTED	1	0
7/0:1	digital	7/2	STOPPED	NA	NA
7/0:2	digital	7/1	STARTED	3	0
7/0	serial	7/0	STARTED	0	0

The following example displays the interface, type, channel ID, and SS7 session set for all configured SS7 links on a Cisco 2611 or Cisco 2651. The SCC and state columns have been omitted in the output for these platforms.

```
Router# show ss7 mtp1 links
```

```
SS7 MTP1 Links [num = 4, platform max = 4]:
```

```
session channel session set
```

interface	type	channel	set
0/0	serial	0	0
0/1	serial	1	0
0/2:0	digital	2	1
0/3:0	digital	3	1

The following example displays SS7 session set information on any Cisco SLT platform:

```
Router# show ss7 sm set
```

```
Session-set:0
  State           = ACTIVE
  Failover-timer = 5 secs.

  2 Sessions:
    session 0 session-state ACTIVE   remote-host 172.16.0.1:7770
    session 1 session-state STANDBY  remote-host 172.16.1.0:7770

  3 SS7 Links:
    7/0 (ser.) chan-id 0 variant Bellcore link-state INSERVICE
    7/0:0 (dig.) chan-id 1 variant Bellcore link-state INSERVICE
    7/0:2 (dig.) chan-id 3 variant Bellcore link-state INITIAL_ALIGNMENT
  .
  .
  .
```

For complete sample output for this command, see the [show ss7 sm set](#) command reference page.

Additional References

The following sections provide additional references related to the Multiple OPC Support for the Cisco Signaling Link Terminal feature:

- [Related Documents, page 19](#)
- [Standards, page 19](#)
- [MIBs, page 19](#)
- [RFCs, page 20](#)
- [Technical Assistance, page 20](#)

Related Documents

Related Topic	Document Title
Cisco 2600 series	Cisco 2600 Series Routers documentation index.
Cisco AS5350	Cisco AS5350 documentation index.
Cisco AS5400	Cisco AS5400 documentation index.
Cisco IOS Release 12.2	Release notes index, Cisco IOS Release 12.2 T.
How to configure a Cisco router or access server to support voice, video, and fax applications	Cisco IOS Voice, Video, and Fax Configuration Guide, Release 12.2.
How to use Cisco IOS commands to support voice, video, and fax applications	Cisco IOS Voice, Video, and Fax Command Reference, Release 12.2T.
Cisco MGC	Cisco Media Gateway Controller Software Release 9 Documentation.
Cisco SLT	Cisco Signaling Link Terminal documentation index.
SS7 interconnect on Cisco access servers	Cisco SS7 Interconnect for Access Servers Solution, Release 2.2.
SS7 interconnect on Cisco voice gateways	Cisco SS7 Interconnect for Voice Gateways Solution, Release 1.3.
How to use Cisco interface cards used in modular routers	Cisco WAN Interface Cards Hardware Installation Guide.
How the Cisco SLT feature works on a Cisco AS5350 or Cisco AS5400	Integrated Signaling Link Terminal.
Four SS7 signaling link support for the Cisco 2651	SS7 Four-Link Support for Cisco Signaling Link Terminal.

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL: http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:

<http://tools.cisco.com/ITDIT/MIBS/servlet/index>

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

<http://www.cisco.com/register>

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

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

Command Reference

This section documents new and modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 T command reference publications.

New Commands

- [session-set](#)
- [ss7 set](#)

Modified Commands

- [channel-id](#)
- [show ss7 mtp1 links](#)
- [show ss7 sm set](#)
- [ss7 session](#)

channel-id

To assign a session channel ID to a Signaling System 7 (SS7) serial link or assign an SS7 link to an SS7 session set on a Cisco AS5350 or Cisco AS5400, use the **channel-id** command in interface configuration mode. To disable a session channel ID link, use the **no** form of this command.

channel-id *channel-id* [**session-set** *session-set-id*]

no channel-id

Syntax Description		
<i>channel-id</i>	Selects a unique session channel ID. This session channel ID is needed when the link with a Reliable User Datagram Protocol (RUDP) session to the Media Gateway Controller (MGC) is associated.	
session-set <i>session-set-id</i>	(Optional) Creates an SS7-link-to-SS7-session-set association on the Cisco AS5350- and Cisco AS5400-based Cisco Signaling Link Terminals (SLTs).	The <i>session-set-id</i> argument represents the SS7 session ID. Valid values are 0 or 1. Default is 0.

Defaults No default behavior or values

Command Modes Interface configuration

Command History	Release	Modification
	12.2(11)T	This command was introduced on the Cisco AS5350 and Cisco AS5400.
	12.2(15)T	The session-set <i>session-set-id</i> keyword and argument were added.

Usage Guidelines This command is visible only if the object's encapsulation type is changed to SS7.

Before an SS7 serial link can be enabled using the **no shutdown** command, you must enter this command in interface configuration mode to assign a session channel ID to the SS7 serial link. This ID is unique to the Cisco AS5350 and Cisco AS5400, and the command is visible only for provisioned objects whose encapsulation type is the new SS7 value.

The channel identifier is reserved when you explicitly assign an ID using the **channel-id** command for the associated serial interface object. This fails if the selected channel ID is currently assigned to another link or if all channel IDs are already assigned.

A channel identifier is released when the **no channel-id** command is entered. The link must first be shut down to do this. If the **no channel-id** command is used with the Multiple OPC Support for the Cisco Signaling Link Terminal feature, the associated SS7 link has no channel ID. In this state the link is not fully configured and is incapable of supporting signaling traffic.

If the **session-set** keyword is omitted, the command is applied to SS7 session set 0, which is the default. Reissuing the **session-set** keyword with a different SS7 session ID is sufficient to remove the associated SS7 link from its existing SS7 session set and add it to the new one.

Examples

The following example shows a unique session channel ID (0) assigned to the Cisco AS5350 or Cisco AS5400:

```
Router(config-if)# channel-id 0
```

The following example assigns an SS7 link to an SS7 session set on a Cisco AS5350 or Cisco AS5400:

```
Router(config-if)# channel-id 0 session-set 1
```

Related Commands

Command	Description
channel-group	Assigns a channel group and selects the DS0 timeslot(s) desired for SS7 links.
encapsulation ss7	Sets the encapsulation type to SS7.
no shutdown	Changes the administrative state of a port from out-of-service to in-service.
session-set	Creates a Signaling System 7 (SS7)-link-to-SS7-session-set association or to associate an SS7 link with an SS7 session set on the Cisco 2600-based Signaling Link Terminal (SLT).
ss7 mtp2 variant bellcore	Configures the device for Telcordia (formerly Bellcore) standards. This command is hidden in the running configuration with this feature.

session-set

To create a Signaling System 7 (SS7)-link-to-SS7-session-set association or to associate an SS7 link with an SS7 session set on the Cisco 2600-based Signaling Link Terminal (SLT), enter the **session-set** command in global configuration mode. To remove the link from its current SS7 session set and to add it to SS7 session set 0, use the **no** form of this command.

```
session-set session-set-id
```

```
no session-set
```

Syntax Description	<i>session-set-id</i> SS7 session ID. Valid values are from 0 to 3. Default is 0.
---------------------------	---

Defaults	SS7 session set 0
-----------------	-------------------

Command Modes	Global configuration
----------------------	----------------------

Command History	Release	Modification
	12.2(15)T	This command was introduced on the Cisco 2600-based SLT.

Usage Guidelines	On Cisco AS5350 and Cisco AS5400 platforms, the channel-id command is used to create an SS7-link-to-SS7-session-set association on the Cisco SLT. The Cisco 2600 platforms do not support the channel-id command, so channel IDs on the Cisco 2600-based SLT are implicitly assigned on the basis of the slot location of the WAN interface card (WIC) and the channel group ID used to create the SS7 link.
-------------------------	--

Examples	The following example adds as associated SS7 link to an SS7 session set: <pre>Router# session-set 1</pre> <p>The following example removes the link from its current SS7 session set and add it to SS7 session set 0: <pre>Router# no session-set</pre></p>
-----------------	---

Related Commands	Command	Description
	channel-id	Assigns a session channel ID to a Signaling System 7 (SS7) serial link or assigns an SS7 link to an SS7 session set on a Cisco AS5350 or Cisco AS5400.

show ss7 mtp1 links

To display information for each provisioned Signaling System 7 (SS7) link, use the **show ss7 mtp1 links** command in privileged EXEC mode.

show ss7 mtp1 links

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(11)T	This command was introduced on the Cisco AS5350 and Cisco AS5400.
	12.2(15)T	This command was implemented on the Cisco 2600 series.

Usage Guidelines Use this command to display the name of the serial interface for the link, the assigned Media Gateway Controller (MGC) or SCC port, whether the link is serial (12-in-1 port) or digital (E1/T1 trunk DS0), the assigned channel ID, the assigned SS7 session set, and whether the link is stopped or started. This command is useful for quickly letting you know which links have been assigned and which channel IDs are in use.

The output for this command has been modified for the Cisco AS5350 and Cisco AS5400 to show SS7 session set information. For the Cisco 2600 series, the SCC and state columns have been removed from the output.

Examples The following sample output shows that there are four SS7 links (out of a platform maximum of four).

```
Router# show ss7 mtp1 links
```

```
SS7 MTP1 Links [num = 4, platform max = 4]:
```

interface	type	SCC	state	session channel
7/0:0	digital	7/3	STARTED	0
7/0:1	digital	7/2	STARTED	1
7/1:0	digital	7/1	STARTED	2
7/1:1	digital	7/0	STARTED	3

The following example displays the interface, type, SCC port, state, SS7 session set, and channel ID for all configured SS7 links on a Cisco AS5350 or Cisco AS5400.

```
Router# show ss7 mtp1 links
```

```
SS7 MTP1 Links [num = 4, platform max = 4]:
```

interface	type	SCC	state	session channel	session set
7/0:0	digital	7/3	STARTED	1	0
7/0:1	digital	7/2	STOPPED	NA	NA

```

7/0:2 digital 7/1   STARTED   3       0
7/0   serial 7/0   STARTED   0       0

```

The following example displays the interface, type, SS7 session set, and channel ID for all configured SS7 links on a Cisco 2611 or Cisco 2651. The SCC and state columns have been removed from the output for these platforms.

```
Router# show ss7 mtp1 links
```

```
SS7 MTP1 Links [num = 4, platform max = 4]:
```

```

           session session
interface  type  channel  set
-----
    0/0    serial    0        0
    0/1    serial    1        0
    0/2:0  digital    2        1
    0/3:0  digital    3        1

```

Table 1 describes significant fields displayed in the **show ss7 mtp1 links** command output.

Table 1 show ss7 mtp1 links Field Descriptions

Field	Description
interface	Name of the serial interface for the link.
type	Type of link: serial or digital.
SCC	Assigned MGC port. The SCC chip number is used by Cisco developers to check output from the debug ss7 mtp1 command.
state	Whether the link is stopped or started.
session channel	Assigned channel ID.
session set	Assigned SS7 session number.

Related Commands

Command	Description
channel-id	Assigns a session channel ID to an SS7 serial link.
show controllers serial	Displays information about the virtual serial interface.
show ss7 mtp1 links	Displays information for each provisioned SS7 link.
show ss7 mtp2 ccb	Displays SS7 MTP2 CCB-information.
show ss7 mtp2 state	Displays internal SS7 MTP2 state machine information.
show ss7 mtp2 stats	Displays SS7 MTP2 operational statistics.
show ss7 mtp2 timers	Displays durations of the SS7 MTP2 state machine timers.
show ss7 mtp2 variant	Displays information about the SS7 MTP2 protocol variant.
show ss7 sm session	Displays information about an SS7 session manager session.
show ss7 sm set	Displays information about the SS7 failover timer.

show ss7 sm set

To display information about the Signaling System 7 (SS7) session set state, failover timer, member sessions, and SS7 links that belong to an SS7 session set or range of SS7 session sets, use the **show ss7 sm set** command in privileged EXEC mode.

```
show ss7 sm set [ss-id-range]
```

Syntax Description

<i>ss-id-range</i>	(Optional) Displays the SS7 session set ID, state, member sessions, and SS7 links that belong to an SS7 session set or range of SS7 session sets. If the optional <i>ss-id-range</i> argument is omitted, information is displayed for all SS7 session sets.
--------------------	---

Defaults

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(7)XR	This command was introduced.
12.1(1)T	This command was integrated into Cisco IOS Release 12.1(1)T.
12.2(15)T	The <i>ss-id-range</i> argument was added. This command previously displayed only the failover-timer value and had no arguments.

Usage Guidelines

This command is available on all Cisco Signaling Link Terminal (SLT) platforms.

The following are valid SS7 session set ranges. The default is 3 seconds.

1	Selects SS7 session set 1.
0, 2, 3	Selects SS7 session sets 0, 2, and 3.
0-2	Selects SS7 session sets 0, 1, and 2.
0, 2-3	Selects SS7 session sets 0, 2, and 3.
0, 2	Selects SS7 session sets 0 and 2.

Examples

The following example displays failover timer information. The failover timer is set to 3 seconds, which is the default:

```
Router# show ss7 sm set

Session Manager Set
    failover timer = 3 seconds
```

The following example displays the SS7 session set state, failover-timer, member sessions, and SS7 links that belong to a range of SS7 session sets:

```
Router# show ss7 sm set

Session-set:0
  State           = ACTIVE
  Failover-timer = 5 secs.
  2 Sessions:
    session 0 session-state ACTIVE  remote-host 172.16.0.0:5555
    session 1 session-state STANDBY remote-host 172.31.255.255:4444
  3 SS7 Links:
    7/0 (ser.)   chan-id 0 variant Bellcore link-state INSERVICE
    7/0:0 (dig.) chan-id 1 variant Bellcore link-state INSERVICE
    7/0:2 (dig.) chan-id 3 variant Bellcore link-state INITIAL_ALIGNMENT

Session-set:1
  State           = IDLE
  Failover-timer = 5 secs.
  0 Sessions:
  0 SS7 Links:

Session-set:2
  State           = ACTIVE
  Failover-timer = 5 secs.
  2 Sessions:
    session 2 session-state ACTIVE  remote-host 172.16.0.0:6666
    session 3 session-state STANDBY remote-host 172.31.255.255:7777
  1 SS7 Links:
    7/0:1 (dig.) chan-id 2 variant Bellcore link-state INSERVICE

Session-set:3
  State           = IDLE
  Failover-timer = 5 secs.
  0 Sessions:
  0 SS7 Links:
```

[Table 2](#) describes significant fields in this output.

Table 2 *show ss7 sm set Field Descriptions*

Field	Description
Session-set:0	One of four SS7 session sets is configured.
State	The session is ACTIVE.
Failover-timer	The number of seconds is set to 5.
2 Sessions:	<ul style="list-style-type: none"> Session 0—session state is ACTIVE and connected to port 5555 of remote-host 172.16.0.0 Session 1—session state is STANDBY and connected to port 4444 of remote-host 172.31.255.255
3 SS7 Links:	<ul style="list-style-type: none"> SS7 link at serial interface 7/0 has channel ID 0 and current MTP2 link state of INSERVICE. SS7 link at serial interface 7/0:0 has channel ID 1 and current MTP2 link state of INSERVICE. SS7 link at serial interface 7/0:2 has channel ID 3 and current MTP2 link state of INITIAL_ALIGNMENT.
Session-set:1	One of four SS7 session sets is configured.
State	The session is IDLE.

Table 2 show ss7 sm set Field Descriptions (continued)

Field	Description
Failover-timer	The number is set to 5 seconds.
0 Sessions:	No sessions are configured.
0 SS7 Links:	No SS7 links are configured.
Session-set:2	One of four SS7 session sets is configured.
State	The session is ACTIVE.
Failover-timer	The number is set to 5 seconds.
2 Sessions:	<ul style="list-style-type: none"> • Session 2 is ACTIVE and connected to port 6666 of remote host 172.16.0.0 • Session 3 is STANDBY and connected to port 7777 of remote host 172.31.255.255.
1 SS7 Links:	SS7 link at serial interface 7/0:1 has channel ID 2 and current MTP2 link state of INSERVICE.
Session-set:3	One of four SS7 session sets is configured.
State	The session is IDLE.
Failover-timer	The number is set to 5 seconds.
0 Sessions:	No sessions are configured.
0 SS7 Links:	No SS7 links are configured.

Related Commands

Command	Description
ss7 session	Creates a Reliable User Datagram Protocol (RUDP) session and explicitly adds an RUDP session to a Signaling System 7 (SS7) session set.
ss7 set	Independently selects failover-timer values for each session set and specifies the amount of time that the SS7 session manager waits for the active session to recover or for the standby Media Gateway Controller (MGC) to indicate that the Cisco Signaling Link Terminal (SLT) should switch traffic to the standby session.
ss7 set failover timer	Specifies the amount of time that the session manager waits for the session to recover before declaring the session inactive.

ss7 session

To create a Reliable User Datagram Protocol (RUDP) session and explicitly add an RUDP session to a Signaling System 7 (SS7) session set, use the **ss7 session** command in global configuration mode. To delete the session, use the **no** form of this command.

```
ss7 session session-id address destination-address destination-port local-address local-port
[session-set session-number]
```

```
no ss7 session session-id
```

Syntax Description	
<i>session-id</i>	SS7 session number. Valid values are 0 and 1. You must enter a hyphen with no space following it after the session keyword.
address	SS7 session IP address.
<i>destination-address</i>	
<i>destination-address</i>	Remote IP address of the MGC in four-part dotted-decimal format.
<i>destination-port</i>	Number of the remote UDP port on which the MGC is configured to listen. This UDP port cannot be used by another protocol as defined in RFC 1700 and cannot be otherwise used in the network. Valid port ranges are from 1024 to 9999.
<i>local-address</i>	Local IP address of the router in four-part dotted-decimal format. The local IP address for sessions 0 and 1 must be the same.
<i>local-port</i>	Number of the local UDP port on which the router expects to receive messages from the Media Gateway Controller (MGC). Specify any UDP port that is not used by another protocol as defined in RFC 1700 and that is not otherwise used in your network. The local UDP port must be different for session 0 and session 1. Valid port ranges are from 1024 to 9999.
session-set	(Optional) Assigns an SS7 session to an SS7 session set.
<i>session-number</i>	

Defaults No session is configured.

Command Modes Global configuration

Command History	Release	Modification
	12.0(7)XR	This command was introduced.
	12.1(1)T	This command was integrated into Cisco IOS Release 12.1(1)T.
	12.2(15)T	The session-set keyword and the <i>session-number</i> argument were added.

Usage Guidelines

For the Cisco 2600-based SLT, you can configure a maximum of four sessions, two for each Cisco SLT. In a redundant VSC configuration, session 0 and session 2 are configured to one VSC, and session 1 and session 3 are configured to the other. Session 0/1 and session 2/3 run to the Cisco SLT.

The VSC must be configured to send messages to the local port, and it must be configured to listen on the remote port. You must also reload the router whenever you remove a session or change the parameters of a session.

This command replaces the **ss7 session-0 address** and **ss7 session-1 address** commands, which contain hard-coded session numbers. The new command is used for the new dual Ethernet capability.

The new CLI supports both single and dual Ethernet configuration by being backward compatible with the previous **session-0** and **session-1** commands so that you can configure a single Ethernet instead of two, if needed.

For the Cisco AS5350 and Cisco AS5400-based SLT, you can configure a maximum of two sessions, one for each signaling link. In a redundant MGC configuration, session 0 is configured to one MGC and session 1 is configured to the other.

The MGC must be configured to send messages to the local port, and the MGC must be configured to listen on the remote port.

You must reload the router whenever you remove a session or change the parameters of a session.

By default, each RUDP session must belong to SS7 session set 0. This allows backward compatibility with existing SS7 configurations.

If the **session-set** keyword is omitted, the session is added to the default SS7 session set 0. This allows backward compatibility with older configurations. Entering the **no** form of the command is still sufficient to remove the session ID for that RUDP session.

If you want to change the SS7 session set to which a session belongs, you have to remove the entire session first. This is intended to preserve connection and recovery logic.

Examples

The following example sets up two sessions on a Cisco 2611 and creates session set 2:

```
ss7 session-0 address 172.16.1.0 7000 172.16.0.0 7000 session-set 2
ss7 session-1 address 172.17.1.0 7002 172.16.0.0 7001 session-set 2
```

**Note**

The example above shows how the local IP addresses in session 0 and session 1 must be the same.

Related Commands

Command	Description
ss7 session cumack_t	Sets the cumulative acknowledgment timer.
ss7 session k_pt	Sets the null segment (keepalive) timer.
ss7 session m_cumack	Sets the maximum number of segments that can be received before the RUDP sends an acknowledgment.
ss7 session m_outseq	Sets the maximum number of out-of-sequence segments that can be received before the RUDP sends an extended acknowledgment.
ss7 session m_retrans	Sets the maximum number of times that the RUDP attempts to resend a segment before declaring the connection invalid.
ss7 session retrans_t	Sets the retransmission timer.
ss7 session m_rcvnum	Sets the maximum number of segments that the remote end can send before receiving an acknowledgment.

ss7 set



Note

Effective with Cisco IOS Release 12.2(15)T, the **ss7 set** command replaces the **ss7 set failover-timer** command.

To independently select failover-timer values for each session set and to specify the amount of time that the SS7 session manager waits for the active session to recover or for the standby Media Gateway Controller (MGC) to indicate that the Cisco Signaling Link Terminal (SLT) should switch traffic to the standby session, use the **ss7 set** command in global configuration mode. To restore the failover timer to its default value of 5, use the **no** form of this command.

```
ss7 set [session-set session-id] failover-timer ft-value
```

```
no ss7 set [session-set session-id] failover-timer
```

Syntax Description

session-set <i>session-id</i>	(Optional) Selects failover timer values for each SS7 session set. Valid values are from 1 to 5. Default is 0.
failover-timer <i>ft-value</i>	Time, in seconds, that the session manager waits for a session to recover. Valid values range from 1 to 10. Default is 5.

Defaults

The failover timer is not set.

Command Modes

Global configuration

Command History

Release	Modification
12.2(15)T	This command was introduced. This command replaces the ss7 set failover-timer command.

Usage Guidelines

The **failover-timer** keyword and the *ft-value* argument specify the number of seconds that the session manager waits for the active session to recover or for the standby MGC to indicate that the SLT should switch traffic to the standby session and to make that session the active session. If the failover timer expires without recovery of the original session or if the system fails to get an active message from the standby MGC, the signaling links are taken out of service.

The **no** form of this command restores the failover timer to its default value of 5. Omitting the optional **session-set** keyword implicitly selects SS7 session set 0, which is the default.

Examples

The following example sets the failover timer to four seconds without using the **session-set** keyword:

```
ss7 set failover-timer 4
```

The following example sets the failover timer to 10 seconds and sets the SS7 session set value to 5:

```
ss7 set session-set 5 failover-timer 10
```

Related Commands

Command	Description
ss7 session	Creates a Reliable User Datagram Protocol (RUDP) session and explicitly adds an RUDP session to a Signaling System 7 (SS7) session set.
ss7 set failover timer	Specifies the amount of time that the session manager waits for the session to recover before declaring the session inactive.

Glossary

- **ANSI**—American National Standards Institute. A voluntary organization composed of corporate, government, and other members that coordinates standards-related activities, approves U.S. national standards, and develops positions for the United States in international standards organizations. ANSI helps develop international and U.S. standards relating to, among other things, communications and networking. ANSI is a member of the IEC and the ISO.
- **CLI**—command-line interface.
- **DFC**—dial feature card, also referred to as a trunk card.
- **ITU**—International Telecommunication Union.
- **MGC**—Media Gateway Controller.
- **MTP1**—Message Transfer Part Level 1. SS7 architectural level that defines the physical, electrical, and functional characteristics of the digital signaling link.
- **MTP2**—Message Transfer Part Level 2. SS7 data link layer protocol. SS7 architectural level that exercises flow control, message sequence validation, error checking, and retransmission.
- **MTP3**—Message Transfer Part Level 3. SS7 architectural level that provides messages between signaling points in the network, helping control traffic when congestion or failures occur.
- **NAS**—network access server.
- **NIC**—network interface card. Board that provides network communication capabilities to and from a computer system. Also called an adapter.
- **OPC**—origination point code.
- **PC**—point code.
- **PDU**—protocol data unit.
- **PSTN**—public switched telephone network.
- **RUDP**—Reliable User Datagram Protocol.
- **SLS**—(Signaling) link set. A set of signaling link(s) directly connecting two signaling points.
- **SLT**—Signaling Link Terminal.
- **SS7**—Signaling System 7.
- **SSP**—service switching point. SSPs are telephone switches equipped with SS7 software and signaling links. Each SSP is connected to both STPs in a mated pair.
- **STP**—signal transfer point. STPs receive incoming signaling messages and route them toward their destinations. STPs are deployed in mated pairs and share the traffic between them.
- **WAN**—wide-area network.
- **WIC**—WAN interface card.



Note

Refer to the [Internetworking Terms and Acronyms](#) for terms not included in this glossary.
