



Support of ISUP Hop Counter and SIP Max-Forwards Mapping

Document Release History

Publication Date	Comments
February 20, 2006	Initial version of the document.

Feature History

Release	Modification
9.6(1)	This feature was introduced on the PGW 2200 in software Release 9.6(1).

This document describes the Support of ISUP Hop Counter and SIP Max-Forwards Mapping feature.

This feature is described in the following sections:

- [Feature Overview, page 2](#)
- [Supported Standards, MIBs, and RFCs, page 3](#)
- [Prerequisites for Using This Feature, page 3](#)
- [Provisioning Tasks, page 3](#)
- [Provisioning Examples, page 11](#)
- [Command Reference, page 11](#)
- [Reference Information, page 12](#)
- [Obtaining Documentation, page 13](#)
- [Documentation Feedback, page 15](#)
- [Cisco Product Security Overview, page 15](#)
- [Obtaining Technical Assistance, page 16](#)
- [Obtaining Additional Publications and Information, page 17](#)
- [Glossary, page 18](#)

Feature Overview

The Support of ISUP Hop Counter and SIP Max-Forwards Mapping feature supports mapping of the ISDN User Part (ISUP) hop counter parameter and the Session Initiation Protocol (SIP) Max-Forwards field to prevent loops when calls are made between the public switched telephone network (PSTN) and SIP domains on the Cisco PGW 2200.

This feature provides the following:

- Applies mapping between the SIP Max-Forwards and the ISUP hop counter
- Supports both ITU and ANSI ISUP hop counter and SIP Max-Forwards
- Supports mapping between SIP-to-ISUP and SIP-to-EISUP
- Adds two sigPath property values: SipToIsupRatio, for mapping from SIP to ISUP or EISUP and IsupToSipRatio, for mapping from ISUP or EISUP to SIP

Benefits

Prevent Loops for Calls Between PSTN and SIP Domains

For a call between ISUP or EISUP and SIP, the setting of the SipToIsupRatio and IsupToSipRatio properties in the MGC allows mapping to the hop counter field in the Initial Address Message (IAM) and Max-Forwards field in the INVITE request message. This feature adds the mapping function between the two fields into the MGC. The mapping is only applied between SIP and ISUP (both ITU and ANSI), and SIP and EISUP. This feature is applicable to ANSI ISUP and ITU ISUP (Q.761),

Related Documents

This document contains information that is related strictly to this feature. The documents that contain additional information related to the Cisco Media Gateway Controller (MGC) are listed below:

- *Release Notes for Cisco Media Gateway Controller Software Release 9.6(1)*
- *Cisco Media Gateway Controller Hardware Installation Guide*
- *Regulatory Compliance and Safety Information for the Cisco Media Gateway Controller*
- *Cisco Media Gateway Controller Software Release 9 Installation and Configuration Guide*
- *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*
- *Cisco Media Gateway Controller Software Release 9 Dial Plan Guide*
- *Cisco Media Gateway Controller Software Release 9 MML Command Reference*
- *Cisco Media Gateway Controller Software Release 9 Messages Reference Guide*
- *Cisco Media Gateway Controller Software Release 9 Billing Interface Guide*
- *Cisco Media Gateway Controller Software Release 9 Management Information Base Guide*
- *Cisco Media Gateway Controller Software Release 9 Operations, Maintenance, and Troubleshooting Guide*

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

For more information on the MIBs used in the Cisco MGC software, refer to the *Cisco Media Gateway Controller Software Release 9 Management Information Base Guide*.

RFCs

No new or modified RFCs are supported by this feature.

Prerequisites for Using This Feature

You must have Cisco MGC software Release 9.6(1). Prerequisites for this release can be found in the *Release Notes for the Cisco Media Gateway Controller Software Release 9.6(1)*.

Provisioning Tasks

The following sections describe the provisioning tasks related to this feature:

- [Provisioning Prerequisites, page 3](#)
- [Provisioning Procedures, page 4](#)

Provisioning Prerequisites

This section lists the data that you must gather to successfully provision this feature. For more information on planning the provisioning for the rest of the Cisco MGC software, refer to the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

Collecting Device Data

The devices to which the MGC communicates must be provisioned. You must be ready to enter the following data about the external devices:

- MML name
- Component description
- The type of the external node
- ISDN signaling type

You can define the parameters for your external nodes in [Table 2](#) in the “Properties” section on [page 12](#).

Collecting Signal Path Data

The signal path component types represent the signaling service to particular Cisco media gateways, or other devices to which the MGC is connected. You must be ready to enter the following signal path data:

- MML name
- Component description
- MML name of the associated external node
- Customer group ID
- Signaling port number (physical port on the Cisco media gateway)
- Signaling port slot (physical slot on the Cisco media gateway)

You can define the parameters for your NAS signaling services in [Table 2](#) in the “[Properties](#)” section on [page 12](#).

Provisioning Procedures

Provision the transport path between the IUA IOCCs of the Cisco MGC 2200 and the external Cisco media gateway nodes. Communication between the Cisco MGC 2200 and the Cisco media gateways is provisioned so that there is a reliable communication path between the two platforms.

This provisioning is performed when an external node is modified to use an SCTP-based protocol or when a new external node is added to the Cisco MGC 2200. This section covers the following provisioning topics:

- [Provisioning Basics, page 4](#)
- [Adding Properties, page 9](#)
- [Modifying ISUP to SIP and SIP to ISUP Ratio Properties, page 10](#)
- [Deleting ISUP to SIP and SIP to ISUP Ratio Properties, page 10](#)

Provisioning Basics

Use the procedures in this section to start a provisioning session and save and activate the changes you have made.

- [Starting a Provisioning Session, page 4](#)
- [Saving and Activating Your Provisioning Changes, page 5](#)
- [Ending a Provisioning Session Without Activating Your Changes, page 6](#)
- [Retrieving Provisioning Data, page 6](#)

For more detailed information about provisioning your Cisco MGC, refer to the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

Starting a Provisioning Session

You may need to start a provisioning session as part of your system operations. To do this, log in to the active Cisco MGC, start an MML session, and enter the following command:

```
prov-sta::srcver="curr_ver",dstver="mod_ver"
```

Where:

- *curr_ver*—The name of the current configuration version. In place of the name of the current configuration version, you can also enter:
 - new—A new default session configuration; no existing source configuration is available.
 - active—Selects the active configuration as the source for configuration changes.



Note If you do not know the name of your current configuration session, you can learn it by using the procedure described in the [“Retrieving Data on the Current Provisioning Session” section on page 7](#).

- *mod_ver*—A new configuration version name that contains your provisioning changes.

For example, to use a configuration version called ver1 as the basis for a version to be called ver2, you would enter the following command:

```
prov-sta::srcver="ver1",dstver="ver2"
```

Once a provisioning session is underway, you can use the **prov-add**, **prov-ed**, and **prov-dlt** MML commands to add, modify, and delete components on your system. This document describes how to provision this feature. For more information on provisioning other components on your Cisco MGC, refer to the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

There are two ways to close your provisioning session: saving and activating your provisioning changes, as described in the [“Saving and Activating Your Provisioning Changes” section on page 5](#) or ending your provisioning session without saving and activating your changes, as described in the [“Ending a Provisioning Session Without Activating Your Changes” section on page 6](#).

Saving and Activating Your Provisioning Changes

When you have completed making provisioning changes in your session, you must enter a command to save and activate your changes. There are two different provisioning MML commands that do this: **prov-cpy** and **prov-dply**.



Caution

Using the **prov-cpy** and **prov-dply** MML commands can severely impact your system’s call processing performance, depending on the extent of your provisioning changes. We recommend that these commands be issued during a maintenance window when traffic is minimal.

The **prov-cpy** MML command is used to save and activate your changes on simplex Cisco MGC (single-host) systems.



Note

When you enter the **prov-cpy** command, your provisioning session is also automatically ended. If you want to make additional provisioning changes, you must start a new provisioning session as described in the [“Starting a Provisioning Session” section on page 4](#).



Caution

Do not use the **prov-cpy** command to save and activate your changes on a continuous-service Cisco MGC system (one with active and standby hosts) system. Saving and activating using **prov-cpy** on such a system would require using the **prov-sync** MML command to synchronize the provisioning data on the active and standby hosts. The system does not indicate when the synchronization process fails, which would create problems when a switchover operation occurs.

The **prov-dply** MML command is used to save and activate your changes on the active and standby Cisco MGCs in a continuous-service system. This command should not be used on a Cisco MGC in a simplex configuration.

**Note**

When you enter the **prov-dply** command, your provisioning session is also automatically ended, unless an error occurs during execution. If you want to make additional provisioning changes, you must start a new provisioning session, as described in the “[Starting a Provisioning Session](#)” section on page 4.

Ending a Provisioning Session Without Activating Your Changes

If you want to end a provisioning session without saving and activating the changes you have entered, enter the **prov-stp** MML command. This command ends your current provisioning session, and your changes are not entered.

Retrieving Provisioning Data

You can use the **prov-rtrv** MML command to retrieve information about your current provisioning settings. The ways you can use this command to retrieve provisioning data are described in the following sections:

- [Retrieving Data for an Individual Component, page 6](#)
- [Retrieving Data for All Components, page 7](#)
- [Retrieving Data for All Components of a Particular Type, page 7](#)
- [Retrieving Data on the Current Provisioning Session, page 7](#)
- [Retrieving Data on Supported Signaling Protocols, page 7](#)

Retrieving Data for an Individual Component

You can retrieve provisioning data on any individual component on your system. To do this, log in to the active Cisco MGC, start an MML session, and enter the following command:

```
prov-rtrv:component:name=MML_name
```

Where:

- *component*—The MML component type associated with the desired component. You can find a complete list of MML component types in the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.
- *MML_name*—The MML name for the desired component. You can determine the MML names for the various components using the **prov-rtrv:all** MML command.

For example, to view the provisioning data for an SS7 signaling service called `ss7svc1`, you would enter the following command:

```
prov-rtrv:ss7path:name="ss7svc1"
```

The response to the command is dependent upon the component type associated with the desired component. For example, to view the properties for an SUA routing key called `suakey1`, you would enter the following command:

```
prov-rtrv:suakey:name="suakey1"
```

Retrieving Data for All Components

You can retrieve data on all of the components provisioned on your system. To do this, log in to the active Cisco MGC, start an MML session, and enter the following command:

```
prov-rtrv:all
```

Retrieving Data for All Components of a Particular Type

You can retrieve provisioning data on all components of a particular type on your system. To do this, log in to the active Cisco MGC, start an MML session, and enter the following command:

```
prov-rtrv:component:"all"
```

Where *component* is the MML component type associated with the desired component group. You can find a complete list of MML component types in the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

For example, to view the provisioning data for all SS7 signaling services, you would enter the following command:

```
prov-rtrv:ss7path:"all"
```

Retrieving Data on the Current Provisioning Session

You can retrieve provisioning data on the current provisioning session. To do this, log in to the active Cisco MGC, start an MML session, and enter the following command:

```
prov-rtrv:session
```

The system returns a response similar to the following:

```
MGC-02 - Media Gateway Controller 2004-01-13 13:39:19
M RTRV
  "session=jtest:session"
  /*
Session ID = mml1
SRCVER = active
DSTVER = jtest
  */
```

Retrieving Data on Supported Signaling Protocols

You can retrieve protocol data for the current provisioning session. To do this, log in to the active Cisco MGC, start an MML session, and enter the following command:

```
prov-rtrv:variants
```

Adding Components

- The range of the SipToIsupRatio and IsupToSipRatio property values is 1 – 4 and the default value of each property is 0.
- When the two property values are 0, no mapping is required, and the existing mechanism is applied.
- The mapping for each direction is independent of mapping for the other. When either property value is set to 0, there is no mapping for the corresponding direction.
- When both property values are not 0, the mapping mechanism is applied two both directions.

- When you are mapping from SIP-to-ISUP or from SIP-to-EISUP, the Hop Counter value is derived from Max-Forwards \div SipToIsupRatio; it is then decremented by 1 before being sent out to the ISUP or EISUP trunk group(s).
- When you are mapping from ISUP-to-SIP or EISUP-to-SIP, the Max-Forwards value is derived from IsupToSipRatio \times Hop Counter; and then decremented by 1 before being sent to the SIP outgoing trunk group(s).
- When you are mapping from SIP or Generic Transparency Descriptor (GTD) to ISUP, the Hop Counter value in GTD takes precedence over the SIP Max-Forwards value when the Hop Counter is present; the Max-Forwards value is used to derive the ISUP Hop Counter.
- When the derived Max-Forwards or Hop Counter value is not integer, rounding is applied. Values from 0.5 through 0.9 are rounded up to 1, and values from 0.4 through 0.1 are rounded down to 0.
- When decrementing the derived value of Max-Forwards or Hop Counter by 1 results in 0, the call is released.

For a call between ISUP or EISUP and SIP, this feature adds the Hop Counter field in the Initial Address Message (IAM) and the Max-Forwards field in the INVITE request message mapping function between the two fields into the MGC. For a SIP-to-ISUP call, in the incoming side, the SIP OCC first checks the received Max-Forwards value, rounds it up or down, and then stores the result value. In the outgoing side, the ISUP TCC retrieves the Max-Forwards value and decreases it by 1. If the result is greater than 0, the call continues. However, if the result value is less than 0, the call is released.

For an ISUP-to-SIP call, in the incoming side, the ISUP OCC first checks the received Hop Counter field in the IAM and stores that value in the outgoing side. The SIP TCC retrieves the value, rounds the value up or down, then decreases the result value by 1. If the final result is greater than 0, that value is assigned to Max-Forwards and the call continues. However, if the result value is less than 0, the call is released.

This feature is applicable to ANSI ISUP and ITU ISUP (Q.761), but it is not applicable to ITU ISUP (Q.767) because the Hop Counter field does not exist in any messages that comply with Q.767.

The following sections show examples of mapping from SIP to ISUP or EISUP.

Mapping from SIP to ISUP or EISUP

The SIP originating Max-Forwards value = 50

The SipToIsupRatio property value = 3

The resulting Hop Counter value = $50 \div 3 = 17 - 1 = 16$



Note For $50 \div 3 = 16.67$, the quotient remainder of 0.67 is rounded up to 1, therefore, $17 - 1$ is the derived Hop Counter value.

Mapping from ISUP or EISUP to SIP

The ISUP originating Hop Counter Value = 22

The IsupToSipRatio property value = 2

The resulting Max-Forwards value = $22 \times 2 - 1 = 43$

Calls released when resulting mapping of either value is 0

The SIP originating Max-Forwards value = 5

The SipToIsupRatio property value = 4

The resulting Hop Counter value = 1 (the actual quotient was 0.25, which is rounded down to 0) $- 1 = 0$

Mapping SIP or GTD to ISUP when GTD Hop Counter is Present

The SIP originating Max-Forwards value = 50

The GTD Hop Counter value = 5

The resulting ISUP Hop Counter value = 4 (GTD Hop Counter decremented by 1)

Mapping SIP or GTD to ISUP when GTD Hop Counter is Absent

The SIP originating Max-Forwards value = 50

The SipToIsupRatio property value = 3

The resulting Hop Counter value = $50 \div 3 = 17 - 1 = 16$ (the actual quotient was 16.67, which is rounded up to 17)

Adding Properties

This section contains the procedures that you perform to add the SipToIsupRatio and IsupToSipRatio properties to your Cisco MGC provisioning data.

- [Adding the SIP to ISUP Ratio, page 9](#)
- [Adding the ISUP to SIP Ratio, page 9](#)

Adding the SIP to ISUP Ratio

To add the SIP to ISUP ratio property in your provisioning data, perform the following steps:

Step 1 Start a provisioning session, as described in the [“Starting a Provisioning Session” section on page 4](#).

Step 2 Provision the SipToIsupRatio property with the following MML command.

```
mm1> prov-add:sigsvccprop:name="sip-path",SipToIsupRatio="1"
```

Step 3 Check the SipToIsupRatio value with the following MML command:

```
mm1> prov-rtrv:sigsvccprop:name="sip-sigpath"
```

Verify that the SipToIsupRatio property value is 1.

Where:

- *name*—The name you want to give to the signaling service property. The name can be as many as 20 characters long and can contain numbers, letters, and the dash (-) symbol. The name should begin with a letter.

Step 4 If there are no other parameters or components that you need to provision, end your provisioning session as described in the [“Saving and Activating Your Provisioning Changes” section on page 5](#).

Adding the ISUP to SIP Ratio

To add the ISUP to SIP ratio to your provisioning data, perform the following steps:

Step 1 Start a provisioning session, as described in the [“Starting a Provisioning Session” section on page 4](#).

Step 2 Provision the IsupToSipRatio property with the following MML command.

```
mml> prov-add:sigsvccprop:name="sip-path",isupToSipRatio="1"
```

Step 3 Check the IsupToSipRatio value with the following MML command:

```
mml> prov-rtrv:sigsvccprop:name="sip-sigpath"
```

Verify that the IsupToSipRatio property value is 1.

Where:

- *name*—The name you want to give to the signaling service property. The name can be as many as 20 characters long and can contain numbers, letters, and the dash (-) symbol. The name should begin with a letter.

Step 4 If there are no other parameters or components that you need to provision, end your provisioning session as described in the [“Saving and Activating Your Provisioning Changes” section on page 5](#).

Modifying ISUP to SIP and SIP to ISUP Ratio Properties

The following sections contain the procedures for modifying the ISUP to SIP and SIP to ISUP ratio properties in your Cisco MGC provisioning data:

- [Modifying ISUP to SIP and SIP to ISUP Ratios, page 10](#)

Modifying ISUP to SIP and SIP to ISUP Ratios

To modify the ISUP to SIP and SIP to ISUP ratios of a Cisco media gateway external node, perform the following steps:

Step 1 Start a provisioning session as described in the [“Starting a Provisioning Session” section on page 4](#).

Step 2 Modify the SipToIsupRatio and IsupToSipRatio values with the following MML command.

```
mml> prov-ed:sigsvccprop:name="sip-path",SipToIsupRatio="1",IsupToSipRatio="2"
```

Where:

- *name*—The name of the signaling service property to be modified.

Step 3 If there are no other parameters or components that you need to modify, end your provisioning session as described in the [“Saving and Activating Your Provisioning Changes” section on page 5](#).

Deleting ISUP to SIP and SIP to ISUP Ratio Properties

The following sections contain the procedures for deleting the ISUP to SIP and SIP to ISUP ratio properties in your Cisco MGC 2200 provisioning data:

- [Deleting the ISUP to SIP Ratio, page 10](#)
- [Deleting the SIP to ISUP Ratio, page 11](#)

Deleting the ISUP to SIP Ratio

Step 1 Start a provisioning session, as described in the [“Starting a Provisioning Session” section on page 4](#).

- Step 2** Delete the ISUP to SIP ratio with the following MML command.
- ```
mml> prov-dlt:sigsvccprop:name="sip-path",IsupToSipRatio
```
- Step 3** After deleting the IsupToSipRatio property on sip-path, check the IsupToSipRatio property value and verify that it is the default value of 0.
- Step 4** If there are no other parameters or components that you need to provision, end your provisioning session as described in the [“Saving and Activating Your Provisioning Changes” section on page 5](#).
- 

### Deleting the SIP to ISUP Ratio

- Step 1** Start a provisioning session, as described in the [“Starting a Provisioning Session” section on page 4](#).
- Step 2** Delete the SIP to ISUP ratio with the following MML command.
- ```
mml> prov-dlt:sigsvccprop:name="sip-path",SipToIsupRatio
```
- Step 3** After deleting the SipToIsupRatio property on sip-path, check the SipToIsupRatio property value and verify that it is the default value of 0.
- Step 4** If there are no other parameters or components that you need to provision, end your provisioning session as described in the [“Saving and Activating Your Provisioning Changes” section on page 5](#).
-

Provisioning Examples

This section provides a provisioning example for this feature. Additional provisioning examples for the Cisco MGC software can be found in the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

```
prov-add:sigsvccprop:name="sip-path",SipToIsupRatio="1"  
prov-add:sigsvccprop:name="sip-path",IsupToSipRatio="1"
```

Command Reference

This section documents new, modified, or deleted Man-Machine Language (MML) commands. All other MML commands are documented in the *Cisco Media Gateway Controller Software Release 9 MML Command Reference Guide*.

Modified MML Commands

This section contains the MML commands that are modified for this feature.

PROV-ADD:sigsvccprop—Provision Signaling Service Properties (Release 9.6(1))

Purpose:	This MML command provisions signaling service properties.
Syntax:	<code>prov-add:sigsvccprop:name="name",SipToIsupRatio="value"</code> <code>prov-add:sigsvccprop:name="name",IsupToSipRatio="value"</code>
Input Description:	<ul style="list-style-type: none"> • <i>Name</i>—Name of an existing signalling service. Enter an alphanumeric string up to 20 characters in length. • <i>SipToIsupRatio</i>—The SIP to ISUP ratio property. or • <i>IsupToSipRatio</i>—The ISUP to SIP ratio property • <i>value</i>—Valid values are: <ul style="list-style-type: none"> – 0—The mapping is disabled – 1 through 4—The mapping ratio value.
Example:	<p>The MML command shown in the following example sets the SIP to ISUP ratio to 1 and the ISUP to SIP ratio 2:</p> <pre>mml> prov-ed:sigsvccprop:name="sip-path",SipToIsupRatio="1", IsupToSipRatio="2"</pre>
Comments:	Performance Impact Category: A

Reference Information

The following sections contain reference material related to this feature. Information is included on the following areas:

- [Properties, page 12](#)

Properties

The properties in this section are used for this feature. For information on other properties for the Cisco MGC software, refer to the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide*.

The parent object for the properties involved in this feature are found in [Table 1](#).

Table 1 Software Properties Related to This Feature

Property Name	Parent Object																			
	AVM	DPNSS	EISUP	IOCC	ISDNPRI	MGCP	RLM	SESSION	SGCP	SS7-ANSI	SS7-China	SS7-ITU	SS7-Japan	SS7-UK	TALI-IOCC	TCAPOverIP	TrunkGroup	VSI	SIP	
SipToIsupRatio																				X
IsupToSipRatio																				X

The properties used for this feature are described in [Table 2](#) and their dynamically provisionable status is listed in [Table 3](#).

Table 2 Properties Added with This Feature

Property	Definition
SipToIsupRatio	Set the ratio of Max_Forwards to Hop Counter for a call from SIP to ISUP. Valid range: 0 or 1 through 4. (0 indicates the mapping does not function). Valid values: 0 through 4. Default value: 0
IsupToSipRatio	Set the ratio of Max_Forwards to Hop Counter for a call from ISUP to SIP. Valid range: 0 or 1 through 4. (0 indicates the mapping does not function). Valid values: 0 through 4. Default value: 0

Table 3 Provisionable Properties

Property	Modified Value Takes Effect Without Restart
SipToIsupRatio	Yes
IsupToSipRatio	Yes

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

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

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

Cisco documentation and additional literature are available in the Product Documentation DVD package, which may have shipped with your product. The Product Documentation DVD is updated regularly and may be more current than printed documentation.

The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software installation, configuration, and command guides for Cisco products and to view technical documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD=) from the Ordering tool or Cisco Marketplace.

Cisco Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

Cisco Marketplace:

<http://www.cisco.com/go/marketplace/>

Ordering Documentation

Beginning June 30, 2005, registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Cisco will continue to support documentation orders using the Ordering tool:

- Registered Cisco.com users (Cisco direct customers) can order documentation from the Ordering tool:

<http://www.cisco.com/en/US/partner/ordering/>

- Instructions for ordering documentation using the Ordering tool are at this URL:

http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 1 800 553-NETS (6387).

Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can send comments about Cisco documentation to bug-doc@cisco.com.

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Customer Document Ordering
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- Nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

**Tip**

We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.htm

The link on this page has the current PGP key ID in use.

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

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

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

**Note**

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:
<http://www.ciscopress.com>
- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:
<http://www.cisco.com/packet>
- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:
<http://www.cisco.com/go/iqmagazine>
or view the digital edition at this URL:
<http://ciscoiq.texterity.com/ciscoiq/sample/>
- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:
<http://www.cisco.com/ipj>
- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:
<http://www.cisco.com/en/US/products/index.html>
- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:
<http://www.cisco.com/discuss/networking>
- World-class networking training is available from Cisco. You can view current offerings at this URL:
<http://www.cisco.com/en/US/learning/index.html>

Glossary

Table 4 contains expansions of acronyms and technical terms used in this feature module.

Table 4 *Acronyms and Expansions*

Acronym	Expansion
GTD	Generic Transparency Descriptor
HOC	Hop Counter, in GTD format
IAM	Initial Address Message

Table 4 *Acronyms and Expansions*

Acronym	Expansion
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
MGC	(Cisco) Media Gateway Controller
PGW	PSTN Gateway
PSTN	public switched telephone network
SC	Signaling Controller
SIP	Session Initiation Protocol
VSC	Virtual Switch Controller