



# Release Notes for GGSN 5.1 on the Catalyst 6000 / Cisco 7600 MWAM for Cisco IOS Software Release 12.3(11)YJ

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Cisco IOS Release 12.3(11)YJ

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These release notes for the Cisco GGSN Release 5.1 on the Cisco Multi-processor WAN Application Module (MWAM) describe the enhancements provided in Cisco IOS Release 12.3(11)YJ. These release notes are updated as needed.

For a list of the software caveats that apply to Cisco IOS Release 12.3(11)YJ, see the “[Caveats with Cisco IOS Release 12.3\(11\)YJ](#)” section on page 7 and *Caveats for Cisco IOS Release 12.3 T*. The caveats document is updated for every maintenance release and is located on Cisco.com and the Documentation CD-ROM.

Use these release notes with *Cross-Platform Release Notes for Cisco IOS Release 12.3* located on Cisco.com and the Documentation CD-ROM.

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<http://www.cisco.com/warp/public/732/docsurvey/rtg/> to give us your feedback .

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## Introduction to Cisco GGSN on the Cisco MWAM

The following sections describe Cisco GGSN and the Catalyst 6500 / Cisco 7600 Multi-processor WAN Application Module (MWAM).

- [Cisco GGSN Overview, page 2](#)
- [Cisco MWAM Overview, page 3](#)

## Cisco GGSN Overview

Gateway GPRS support node (GGSN) is a service designed for Global System for Mobile Communications (GSM) networks. GSM is a digital cellular technology that is used worldwide, predominantly in Europe and Asia. GSM is the world's leading standard in digital wireless communications.

GPRS is standardized by the European Telecommunications Standards Institute (ETSI). The most common application of GPRS is expected to be Internet/intranet access. Cisco Systems' GPRS solution enables mobile wireless service providers to supply their mobile subscribers with packet-based data services in GSM networks.

GPRS introduces the following two new major network elements:

- **SGSN**—Sends data to and receives data from mobile stations, and maintains information about the location of a mobile station (MS). The SGSN communicates between the MS and the GGSN. SGSN support is available from Cisco partners or other vendors.
- **GGSN**—A wireless gateway that allows mobile cell phone users to access the public data network (PDN) or specified private IP networks. The GGSN function is implemented on the Cisco Systems' router.

Combined 2.5G and 3G packet gateway support and interworking capability on the same node was introduced in Cisco GGSN Release 4.0.

## Cisco MWAM Overview

With Cisco IOS Software Release 12.3(2)XB and later, Cisco GGSN software can run on the Cisco MWAM installed in a Catalyst 6500 series switch or Cisco 7600 series router.

The MWAM provides three processor complexes with dual processors used in two of the complexes and a single processor used in the remaining processor complex. This architecture provides five mobile wireless applications on one module.

The MWAM does not provide external ports but is connected to the switch fabric in the Catalyst 6500/Cisco 7600 chassis. An internal Gigabit Ethernet port provides an interface between each processor complex and the Supervisor module. Virtual Local Area Networks (VLANs) direct traffic from external ports via the Supervisor module to each mobile wireless application instance.

The MWAM provides an interface to the IOS image on the Supervisor module. The Supervisor module software enables a single session to be established to each application on the MWAM(s) in the chassis. Each session is used for configuring, monitoring, and troubleshooting application. For information on establishing sessions to mobile wireless application instances on the MWAM, refer to the [Cisco Multi-Processor WAN Application Module Installation and Configuration Notes](#):

[http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/cfgnotes/mwam\\_1cn.htm](http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/cfgnotes/mwam_1cn.htm)



### Note

In this release, each application on the MWAM must be configured individually.

The software image that provides the mobile wireless application feature is downloaded through the Supervisor module and distributed to each processor complex on the MWAM(s). The same image is installed on all the processors in the MWAM.

## System Requirements

This section describes the system requirements for Cisco IOS Release 12.3(11)YJ and includes the following sections:

- [Memory Recommendations, page 3](#)
- [Hardware and Software Requirements, page 4](#)
- [Determining the Software Version, page 4](#)
- [Upgrading to a New Software Release, page 5](#)

## Memory Recommendations

**Table 1** Images and Memory Recommendations for Cisco IOS Release 12.3(11)YJ

Platforms	Feature Sets	Software Image	Flash Memory Recommended	DRAM Memory Recommended	Runs From
Cisco MWAM on Catalyst 6500 / Cisco 7600	GGSN Standard Feature Set	c6svc-mwam-g8is-mz.b1.123-11.YJ.bin	48MB	512MB	RAM

## Hardware and Software Requirements

Proper implementation of the Cisco GGSN features in the Cisco IOS Release 12.3(11)YJ software requires the following hardware and software:

- Two Cisco 7600 series routers with a Cisco Supervisor Engine 720 and third-generation policy feature card (PFC3BXL) with integrated Multilayer Switch Feature Card 3 (MSFC3). The MSFC3s must be running the same Cisco IOS software release. The required release is Cisco IOS Release 12.2(18)SXD2.
- A Cisco Multi-Processor WAN Application Module (MWAM) in each of the Cisco 7600 series routers. The MWAMs must be running the same Cisco GGSN software release.



**Note**

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GGSN Release 5.1, Cisco IOS Release 12.3(11)YJ and later, supports both the standard MWAM 512 MB per processor memory option and the 1 GB per processor memory option.

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For information about Cisco IOS Release 12.2(18)SXD2, refer to the documentation on Cisco IOS Release 12.2 SX New Features available at the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122sx/index.htm>



**Note**

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A Hardware-Software Compatibility Matrix is available on CCO for users with CCO login accounts. This matrix allows users to search for supported hardware components by entering a Cisco platform and IOS Release. The Hardware-Software Compatibility Matrix tool is available at the following URL:

<http://www.cisco.com/cgi-bin/front.x/Support/HWSWmatrix/hswmatrix.cgi>

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## Determining the Software Version

To determine the version of Cisco IOS software running on your Cisco MWAM, log in to the router on one of the MWAM processors and enter the **show version EXEC** command:

```
Router# show version
Cisco Internetwork Operating System Software
IOS (tm) MWAM Software (MWAM-G4JS-M), Version 12.3(11)YJ, EARLY DEPLOYMENT RELEASE
SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 1986-2002 by Cisco Systems, Inc.
```

## Upgrading to a New Software Release

For information on upgrading to a new software release, see the product bulletin *Cisco IOS Software Upgrade Ordering Instructions* located at:

[http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957\\_pp.htm](http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957_pp.htm)

### Upgrading IOS Image on MWAM

For information on upgrading IOS images on the MWAM, refer to the *Cisco Multi-Processor WAN Application Module Installation and Configuration Notes*:

[http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/cfgnotes/mwam\\_icn.htm](http://www.cisco.com/univercd/cc/td/doc/product/core/cis7600/cfgnotes/mwam_icn.htm)



Note

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The image download process loads the IOS image onto the three processor complexes on the MWAM.

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### Upgrading ROMMON Software

To perform an ROMMON software upgrade, use the procedure provided in the *Cisco Multi-Processor WAN Application Module Installation and Configuration Notes*.

## MIBs

### Current MIBs

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

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

## Limitations, Restrictions, and Important Notes

When using Cisco IOS Release 12.3(11)YJ, observe the following:

- Only five instances of the Cisco IOS image 12.3(11)YJ image can be loaded onto the MWAM.
- The same Cisco IOS image is loaded onto all processor complexes on the MWAM.
- Session console is provided by TCP connection from the Supervisor module (no direct console).
- Available memory for bootflash for saving crash information files is 500 KB.
- Only five files can be stored in the bootflash filesystem.
- VRF is not supported on the Catalyst 6500 / Cisco 7600 Supervisor/MSFC2, therefore, you must tunnel encapsulated VRF traffic through the Supervisor/MSFC2 via a GRE tunnel. For more information, see *GGSN Release 5.1 Configuration Guide*.

- To avoid issues with high CPU usage, we recommend the following configurations:
  - To reduce the CPU usage during bootup, disable logging to the console terminal by configuring the **no logging console** global configuration command.
  - To ensure that the HSRP interface does not declare itself active until it is ready to process a peer's Hello packets, configure the delay period before the initialization of HSRP groups with the **standby delay minimum 100 reload 100 interface** configuration command under the HSRP interface.
  - To minimize issues with high CPU usage for additional reasons, such as periods of high PPP PDP processing (creating and deleting), disable the notification of interface data link status changes on all virtual template interfaces of the GGSN using the **no logging event link-status interface** configuration command.

```

!
interface Virtual-Template1
description GGSN-VT
ip unnumbered Loopback0
encapsulation gtp
no logging event link-status
gprs access-point-list gprs
end

```

For implementation of the GGSN Release 5.1 GTP Session Redundancy (GTP-SR) feature, the following additional important notes, limitations, and restrictions apply:

- Hot Standby Routing Protocol (HSRP) Version 2 must be enabled.
- Active and Standby GGSNs must have the same configuration except for certain protocol-related configurations that need to be distinct (for example, the IP addresses of the HSRP-enabled interfaces and the remote IP addresses in the SCTP configuration are different). Each of the configurations *must* be completed in the same order.
- When upgrading to a new Cisco GGSN image, both GGSNs must be loaded together virtually.
- On the SGSN, the values configured for the number GTP N3 requests and T3 retransmissions are larger than the switchover timer. This enables requests sent during a switchover to be serviced by the newly Active GGSN rather than dropped.
- RADIUS has been forced to use the IP address of a specified interface for all outgoing RADIUS packets using the **ip radius source-interface** global configuration command.
- To avoid exceeding the hardware limitation for the number of unique MAC addresses supported on the interface, use a single HSRP primary group and configure all others as HSRP follow groups by using the group number of the primary group.

# New and Changed Information

The following section lists the new implementations and behavior changes in the Cisco IOS Release 12.3 YJ releases:

- [New Implementations and Behavior Changes in Cisco IOS Release 12.3\(11\)YJ, page 7](#)

## New Implementations and Behavior Changes in Cisco IOS Release 12.3(11)YJ

Cisco GGSN Release 5.1, Cisco IOS Release 12.3(11)YJ and later support Active/Standby, 1-to-1 inter-device GTP session redundancy (GTP-SR). GTP-SR enables two GGSNs located on separate Cisco Multi-Processor WAN Application Modules (MWAMs) installed in separate Cisco 7600 series chassis to appear as one network entity and ensures that continuous service is provided to mobile subscribers in the event one of the GGSNs fails.

The Cisco GGSN software uses the Cisco IOS Hot Standby Routing Protocol (HSRP), the Cisco IOS Check-point Facility (CF) and Redundancy Framework (CF), and Stream Control Transmission Protocol (SCTP) to provide inter-device redundancy and high availability.

In a GTP-SR implementation, the Active GGSN establishes and terminates PDP sessions and sends required stateful data to the Standby GGSN. To stay current on the states of active PDP sessions, the Standby GGSN receives the stateful data sent by the Active GGSN. As soon as the Standby GGSN detects that the Active GGSN has failed, it becomes active and assumes the responsibilities of the Active GGSN.

For information on each of this feature see the Cisco IOS Release 12.3(11)YJ Cisco GGSN Release 5.1 configuration guide and command reference:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios123/123newft/123limit/123y/123yj/index.htm>

## Caveats with Cisco IOS Release 12.3(11)YJ

Caveats describe unexpected behavior in Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious. Severity 3 caveats are moderate caveats, and only select severity 3 caveats are included in the caveats document.

This section contains only open and resolved caveats for the current Cisco IOS maintenance release.

All caveats in Cisco IOS Release 12.3 and Cisco IOS Release 12.3 T are also in Cisco IOS Release 12.3(11)YJ.

For information on caveats in Cisco IOS Release 12.3, see *Caveats for Cisco IOS Release 12.3*.

For information on caveats in Cisco IOS Release 12.3 T, see *Caveats for Cisco IOS Release 12.3T*, which lists severity 1 and 2 caveats and select severity 3 caveats and is located on Cisco.com and the Documentation CD-ROM.

### Using the Bug Navigator II

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats the most current list of caveats of any severity for any software release. To reach Bug Navigator II, Login to Cisco.com and click **Software Center: Cisco IOS Software: Cisco Bugtool Navigator II**. Another option is to go directly to <http://www.cisco.com/support/bugtools>.

## Open Caveats

This section documents possible unexpected behavior by Cisco IOS Release 12.3(11)YJ and describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCef56973

**Description:** On a Cisco router running Cisco GGSN software with GTP-SR configured, the Active GGSN drops PDP contexts due to low memory warning even though the free memory is significantly above the memory threshold.

This condition occurs when the memory threshold and GTP-SR are configured on the GGSN.

**Workaround:** There is currently no known workaround.

- CSCeg23418

**Description:** When 500 APN and 500 HRSP groups are configured with sub-interfaces to support 500 VRFs, and Network Address Translation (NAT) is also configured, when 60,000 PDP contexts are opened at 10 calls per second (cps), CPU usage is at 99% all the time.

**Workaround:** There is currently no known workaround.

- CSCeg48467

**Description:** When a large number of GTPv1 IP PDP contexts (RADIUS, local pool) are open and closed with continuous downstream traffic, when the traffic is stopped and the PDP contexts are deleted on the active GGSN, the available bandwidth displayed on the Active GGSN is incorrect.

**Workaround:** There is currently no known workaround.

- CSCeg54690

**Description:** After an SSO failover occurs, the **execute-on slot cpu\_number** command fails to execute on Processor 6.

**Workaround:** There is currently no known workaround.

- CSCeg74017

**Description:** When a Cisco GGSN with a large amount of NAT entries, CPU utilization will be very high even with light traffic. This condition occurs as a result of a large NAT configuration on a standalone.

**Workaround:** There is currently no known workaround.

- CSCsa50945

**Description:** When running a very high rate of signaling on a Cisco GGSN with the charging gateway is disabled for a number of hours, when the signaling traffic is stopped and the charging gateway is active once again, there are CDR containers open but with all PDP contexts are closed.

**Workaround:** There is currently no known workaround but the Cisco IOS SLB feature will help to reduce the rate for each GGSN.

- CSCeg75992

**Description:** A Cisco router running Cisco GGSN software does not send tunnel end-point identifier (TEID) control in the update response if TEID-C is previously confirmed by the SGSN. While this is not a problem, to help inter-operate with SGSNs communicating with one another in GTPv0, but capable of communicating with a GGSN in GTPv1, the new SGSN needs to know the TEID-C of the PDP context.

**Workaround:** There is currently no known workaround.

## Resolved Caveat

The caveat listed in this section is resolved in Cisco IOS Release 12.3(11)YJ. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCef68324

Cisco Internetwork Operating System (IOS) software is vulnerable to a Denial of Service (DoS) and potentially an arbitrary code execution attack from a specifically crafted IPv6 packet. The packet must be sent from a local network segment. Only devices that have been explicitly configured to process IPv6 traffic are affected. Upon successful exploitation, the device may reload or be open to further exploitation.

Cisco has made free software available to address this vulnerability for all affected customers.

More details can be found in the security advisory that is posted at <http://www.cisco.com/warp/public/707/cisco-sa-20050729-ipv6.shtml>.

- CSCeg70410

**Description:** At bootup or after a GGSN switchover, the HRSP virtual IP address on a MWAM processor is not reachable.

## Cisco MWAM Caveats with Cisco IOS Release 12.3(11)YJ

This section lists the Cisco MWAM caveats that are open and resolved with Cisco IOS Release 12.3(11)YJ.

## Open Caveat

The following Cisco MWAM caveat is open with Cisco IOS Release 12.3(11)YJ:

- CSCeg65298

**Description:** When the **exit** command is executed from the privileged EXEC mode of an MWAM processor, you are not always returned to the Supervisor privileged EXEC prompt. Returning to the Supervisor privileged EXEC prompt might take additional exits.

For example, the following procedure places you in MWAM console mode instead of returning to the Supervisor prompt:

- From Supervisor console prompt, enter privilege EXEC mode and session into an MWAM processor.

```
Sup-7600> enable
Sup-7606# session slot slot_number processor processor_number
```

- From the MWAM processor console prompt, enter privilege EXEC mode.

```
mwam-4-2> enable
```

- Display the usability status of interfaces configured for IP.

```
mwam-4-2# show ip interface brief
```

- Type “q” at the more prompt and then issue the **exit** command.

**Workaround:** There is currently no known workaround.

## Resolved Caveat

There are no newly resolved Cisco MWAM caveats for Cisco IOS Release 12.3(11)YJ.

## Documentation Updates

This section contains information that was not included or was documented incorrectly in the *Cisco GGSN Release 5.1 Configuration Guide* or the *GGSN Release 5.1 Command Reference*.

### Creating a Virtual Template Interface

To create a virtual template interface, use the following commands, beginning in global configuration mode:

	Command	Purpose
Step 1	<code>Router(config)# interface virtual-template number</code>	Creates a virtual template interface, where <i>number</i> identifies the virtual template interface. This command takes you to interface configuration mode.  <b>Note</b> A GGSN supports only a single virtual template for the GTP virtual interface.
Step 2	<code>Router(config-if)# ip unnumber loopback number</code>	Assigns the previously defined loopback IP address to the virtual template interface.
Step 3	<code>Router(config-if)# encapsulation gtp</code>	Specifies GTP as the encapsulation type for packets transmitted over the virtual template interface.
Step 4	<code>Router(config-if)# no logging event link-status</code>	Disables the notification of interface data link status changes.
Step 5	<code>Router(config-if)# gprs access-point-list gprs</code>	Specifies a name for a new access point list, or references the name of the existing access point list, and enters access-point list configuration mode.

## Related Documentation

Except for feature modules, documentation is available as printed manuals or electronic documents. Feature modules are available online on CCO and the Documentation CD-ROM.

Use these release notes with these documents:

- [Release-Specific Documents, page 11](#)
- [Platform-Specific Documents, page 11](#)
- [Cisco IOS Software Documentation Set, page 12](#)

## Release-Specific Documents

The following documents are specific to Release 12.3 and are located on CCO and the Documentation CD-ROM:

- *Release Notes for Cisco IOS Release 12.2SX on the Catalyst 6500 and Cisco 7600 Supervisor Engine 720 and Supervisor Engine 2*
- *Cross-Platform Release Notes for Cisco IOS Release 12.3*

On CCO at:

**Technical Documents: Cisco IOS Software Configuration: Cisco IOS Release 12.3: Release Notes: Cross-Platform Release Notes**

- *Caveats for Cisco IOS Release 12.3 T*

See *Caveats for Cisco IOS Release 12.3* and *Caveats for Cisco IOS Release 12.3T*, which contain caveats applicable to all platforms for all maintenance releases of Release 12.3 and Release 12.3 T.

On CCO at:

**Technical Documents: Cisco IOS Software Configuration: Cisco IOS Release 12.3: Caveats**

On the Documentation CD-ROM at:

**Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.3: Caveats**




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**Note** If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on CCO at **Software Center: Cisco IOS Software: Cisco Bug Toolkit: Cisco Bugtool Navigator II**, or at <http://www.cisco.com/support/bugtools>.

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- Product bulletins, field notices, and other release-specific documents on CCO at:

**Technical Documents**

## Platform-Specific Documents

These documents are available for the Catalyst 6500/Cisco 7600 series platforms on Cisco.com and the Documentation CD-ROM:

- *Cisco Multi-Processor WAN Application Module Installation and Configuration Notes*
- Catalyst 6500 Series Switch Documentation:
  - *Catalyst 6500 Series Switch Module Installation Guide*
  - *Catalyst 6500 Series Switch Installation Guide*
  - *Multi-processor WAN Application Module Installation and Configuration Note*
- Cisco 7600 Series Routers Documentation:
  - *Cisco 7600 Series Internet Router Installation Guide*
  - *Cisco 7600 Series Internet Router Module Installation Guide*
  - *Cisco 7609 Internet Router Installation Guide*

Catalyst 6500 Series Switch Documentation is available at the following URL:

<http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/index.htm>

Cisco 7600 Series Routers Documentation is available at the following URL:

[http://www.cisco.com/en/US/products/hw/routers/ps368/products\\_installation\\_guides\\_books\\_list.html](http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_guides_books_list.html)

## Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents that are shipped with your order in electronic form on the Documentation CD-ROM, unless you specifically ordered the printed versions.

### Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, Cisco IOS software functionality, and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

On CCO and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

On CCO at:

**Technical Documents: Cisco IOS Software Configuration: Cisco IOS Release 12.3: Configuration Guides and Command References**

### Release 12.3 Documentation Set

You can find the most current Cisco IOS documentation on CCO and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the hard-copy documents were printed.

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.3**



#### Note

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*Cisco Management Information Base (MIB) User Quick Reference* is no longer published. If you have an account with CCO, you can find the current list of MIBs supported by Cisco. To reach the *Cisco Network Management Toolkit*, go to CCO, press **Login: Technical Support: Software Center: Network Mgmt Software: Cisco Network Management Toolkit: Cisco MIBs**.

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# Documentation Roadmap for Implementing GGSN Release 5.1 on the Cisco MWAM

The following sections list related documentation (by category and then by task) that will be useful when implementing a Cisco GGSN on the Cisco MWAM platform.

## General Overview Documents

### Core Cisco 7609 Documents:

[http://www.cisco.com/en/US/products/hw/routers/ps368/prod\\_technical\\_documentation.html](http://www.cisco.com/en/US/products/hw/routers/ps368/prod_technical_documentation.html)

Navigating from Cisco.com: Products & Services / Routers / Cisco 7600 Series Router / Technical Documentation

### Cisco 7609 Product Literature (white papers, data sheets, brochures):

[http://www.cisco.com/en/US/products/hw/routers/ps368/prod\\_literature.html](http://www.cisco.com/en/US/products/hw/routers/ps368/prod_literature.html)

Navigating from Cisco.com: Products & Services / Routers / Cisco 7600 Series Router / Product Literature

### Cisco IOS Software Mainline Documentation:

[http://www.cisco.com/en/US/products/sw/iosswrel/ps5187/prod\\_technical\\_documentation.html](http://www.cisco.com/en/US/products/sw/iosswrel/ps5187/prod_technical_documentation.html)

Navigating from Cisco.com: Products & Services / IOS Software / Cisco IOS Software Releases / Cisco IOS 12.3 Mainline / Technical Documentation

### Miscellaneous Cisco IOS Software Documentation:

[http://www.cisco.com/en/US/products/sw/iosswrel/products\\_ios\\_cisco\\_ios\\_software\\_category\\_home.html](http://www.cisco.com/en/US/products/sw/iosswrel/products_ios_cisco_ios_software_category_home.html)

## Documentation List by Task

### Getting Started

- *Cisco 7600 Series Internet Router Essentials*

[http://www.cisco.com/en/US/products/hw/routers/ps368/products\\_quick\\_start09186a0080092248.html](http://www.cisco.com/en/US/products/hw/routers/ps368/products_quick_start09186a0080092248.html)

- *Regulatory Compliance and Safety Information for the Cisco 7600 Series Internet Routers*

[http://www.cisco.com/en/US/products/hw/routers/ps368/products\\_regulatory\\_approvals\\_and\\_compliance\\_list.html](http://www.cisco.com/en/US/products/hw/routers/ps368/products_regulatory_approvals_and_compliance_list.html)

### Unpack and install the Cisco 7609 router:

- *Cisco 7609 Internet Router Installation Guide*

[http://www.cisco.com/en/US/products/hw/routers/ps368/products\\_installation\\_guide\\_book09186a008007e036.html](http://www.cisco.com/en/US/products/hw/routers/ps368/products_installation_guide_book09186a008007e036.html)

**Install the Supervisor module and configure the router (basic configuration—VLANs, IP, etc.) using the following documentation:**

- *Cisco 7600 Series Internet Router Module Installation Guide*  
[http://www.cisco.com/en/US/products/hw/routers/ps368/products\\_module\\_installation\\_guide\\_book09186a008007cd9d.html](http://www.cisco.com/en/US/products/hw/routers/ps368/products_module_installation_guide_book09186a008007cd9d.html)
- Cisco IOS Software Configuration Guide that applies to the latest release at the time of FCS  
[http://www.cisco.com/en/US/products/hw/routers/ps368/prod\\_configuration\\_guides\\_list.html](http://www.cisco.com/en/US/products/hw/routers/ps368/prod_configuration_guides_list.html)

**Install and complete the basic Cisco MWAM configuration:**

- *Cisco 7600 Series Internet Router Module Installation Guide*  
[http://www.cisco.com/en/US/products/hw/routers/ps368/products\\_module\\_installation\\_guide\\_book09186a008007cd9d.html](http://www.cisco.com/en/US/products/hw/routers/ps368/products_module_installation_guide_book09186a008007cd9d.html)
- *Cisco Multi-processor WAN Application Module Installation and Configuration Note*  
[http://www.cisco.com/en/US/products/hw/routers/ps368/prod\\_module\\_install\\_config\\_guide\\_list.html](http://www.cisco.com/en/US/products/hw/routers/ps368/prod_module_install_config_guide_list.html)

**Download the Cisco IOS software image containing the GGSN 5.1 feature and configure the GGSNs on the MWAM:**

- Cisco GGSN 5.1 Configuration Guide and Command Reference and Associated Release Notes for Cisco IOS Release 12.3(11)YJ.  
[http://www.cisco.com/en/US/products/sw/iosswrel/ps5413/prod\\_ios\\_releases\\_home.html](http://www.cisco.com/en/US/products/sw/iosswrel/ps5413/prod_ios_releases_home.html)

## 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/univercd/home/home.htm>

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](http://www.cisco.com/public/countries_languages.shtml)

## Ordering Documentation

You can find instructions for ordering documentation at this URL:

[http://www.cisco.com/univercd/cc/td/doc/es\\_inpk/pdi.htm](http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm)

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## Documentation Feedback

You can send comments about technical documentation to [bug-doc@cisco.com](mailto: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.

## Obtaining Technical Assistance

For all customers, partners, resellers, and distributors who hold valid Cisco service contracts, Cisco Technical Support provides 24-hour-a-day, award-winning technical assistance. The Cisco Technical Support Website on Cisco.com features extensive online support resources. In addition, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not hold a valid Cisco service contract, contact your reseller.

## Cisco Technical Support Website

The Cisco Technical Support 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, 365 days a year at this URL:

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

Access to all tools on the Cisco Technical Support 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>

## 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 automatically provides recommended solutions. If your issue is not resolved using the recommended resources, your service request will be assigned to a Cisco TAC 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 TAC 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, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:  
<http://www.cisco.com/go/marketplace/>
- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:  
<http://cisco.com/univercd/cc/td/doc/pcat/>
- *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>
- *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>
- 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>

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