



Cisco Gateway GPRS Support Node Release 6.0

The Cisco® Gateway GPRS Support Node (GGSN) is a high-performance data gateway connecting General Packet Radio Service (GPRS) and Universal Mobile Telecommunications Service (UMTS) mobile operators' Public Land Mobile Networks (PLMNs) to external data networks (Internet, corporate intranet, or multimedia services, for example). The Cisco GGSN supports GPRS 2.5G- and UMTS third-generation (3G)-connected mobile networks. The Cisco GGSN supports the relevant standards while providing enhanced quality of service (QoS), service-aware billing, and high availability. Cisco GGSN software runs on industry-leading Cisco Systems® routing platforms and is based on Cisco IOS® Software technology.

Cisco GGSN Release 6.0 expands the features of widely deployed Release 5.0, bringing Cisco GGSN up to date with the latest standards and customer-requested features. The new features enhance the usability, resilience, and operator control of the Cisco GGSN, making it the most flexible and reliable GGSN available on the market today.

The Cisco GGSN forms part of the Cisco Mobile Exchange architecture. Cisco Mobile Exchange offers mobile operators a complete solution for connectivity, control, and charging. Cisco Mobile Exchange delivers flexible billing methods, ranging from flat-rate volume-based billing to content-aware per-download or per-click billing. Cisco Mobile Exchange uses the proven Cisco 7600 Series router platform to deliver all of the connectivity needs required, including support for GPRS, UMTS, wireless LAN (WLAN), packet data serving node (PDSN), and tunneling protocols such as Generic Routing Encapsulation (GRE), IP Security (IPSec), and Layer 2 Tunneling Protocol (L2TP).

CISCO GGSN RELEASE 6.0 FEATURE OVERVIEW

Cisco GGSN Release 6.0 supports all of the features included in Release 5.0. For more information about Release 5.0, the Cisco GGSN Release 5.0 data sheet is available at http://www.cisco.com/en/US/products/sw/wirelssw/ps873/products_data_sheets_list.html.

Cisco GGSN Release 6.0 adds the following features:

RADIUS-Based Virtual APN Provisioning

This feature eases the provisioning of new Access Point Names (APN) and handsets by making use of the intelligence in Authentication, Authorization, and Accounting (AAA) servers to allow the dynamic per-user mapping of a virtual APN to a target APN. The Cisco GGSN uses the RADIUS protocol to communicate with the AAA server and dynamically download APN provisioning information.

High-Speed Downlink Packet Access

The High-Speed Downlink Packet Access (HSDPA) feature is a packet-based data service in Wideband Code Division Multiple Access (W-CDMA) downlink with data transmission up to 8–16 Mbps over a 5-MHz bandwidth in W-CDMA downlink. The goal of HSDPA is to satisfy user demand for content-rich service delivery and at the same time make optimum use of an operator's existing network resources with minimum capital expenditure. Cisco GGSN Release 6.0 provides support for QoS, accounting, and charging extensions required for HSDPA.

Support of New Informational Elements

Cisco GGSN Release 6.0 extends the optional Informational Elements supported in Create and Delete Packet Data Protocol (PDP) Context Requests to include the following:

- **Radio Access Type**—Indicates whether the Serving GPRS Support Node (SGSN) serves the user equipment by Universal Terrestrial Radio Access Network (UTRAN) or Global System for Mobile Communications/Enhanced Data for Global Evolution (GSM/EDGE) radio access network (RAN), or GERAN.
- **International Mobile Equipment Identity Software Version (IMEISV)**—Indicates identity of mobile equipment and its software version used by the subscriber. For composition of IMEISV, see Third Generation Partnership Project (3GPP) Technical Specifications (TS) 23.003.
- **S-CDR Customized Application for Mobile Enhanced Logic (CAMEL)**—Provides a copy of the tag and length from the SGSN's call detail record (CDR), or S CDR.
- **User Location Information (ULI)**—Gives Cell Global Identity/Service Area Identity (CGI/SAI) of where the mobile station is currently located.
- **Mobile Station Time Zone (MSTZ)**—Indicates the offset between universal time and local time in steps of 15 minutes of where the mobile station currently resides.

Persistent Storage Device Support for CDR Protection

Cisco GGSN Release 6.0 increases the reliability of the Cisco GGSN solution and minimizes the loss of user billing data by implementing this feature. In case both primary and secondary charging gateways are unavailable, the Cisco GGSN backs up charging records to a Cisco Persistent Storage Device (PSD). Subsequently, when one of the charging gateways becomes available, the Cisco GGSN then automatically retrieves the previously stored charging records and dispatches them to the charging gateway using the Ga interface. The retrieval process is rate-controlled to minimize the load impact on the charging gateway system. For more details about the Cisco PSD refer to:

http://www.cisco.com/en/US/products/hw/ps5481/ps5515/products_data_sheets_list.html

This feature is supported only on the Cisco Multiprocessor WAN Application Module (MWAM) card. A Cisco PSD is required.

GTP-Server Load Balancer Enhancements

Cisco GGSN Release 6.0 introduces a sticky database feature on the Server Load Balancer to avoid user session disruption caused by handoffs between SGSNs. The sticky database feature avoids the creation of duplicate PDP contexts on the occurrence of certain error conditions by ensuring that subsequent create requests for the same subscriber are forwarded by the load balancer to the same GGSN. This feature is supported on the Cisco Supervisor Engine 720 on Cisco IOS Software Release 12.2(18)SXE and later.

Early IP Multimedia Subsystem (IMS) Support

Cisco GGSN Release 6.0 extends support of 3GPP specifications by providing support for the Proxy Call Session Control Function (P-CSCF) discovery procedure by the user equipment via the Protocol Configuration Option (PCO) Information Element. Based on the P-CSCF request field in the PCO Information Element, the Cisco GGSN responds with a preconfigured P-CSCF server address in the P-CSCF address field of the PCO Information Element. This feature allows the configuration of Session Initiation Protocol (SIP) proxy addresses under the APN to be used for IMS-like applications. The SIP proxy addresses are then returned in the PCO Information Element, allowing the handset to use IMS-like applications.

CLI Enhancements

Cisco GGSN Release 6.0 enhances the manageability and flexibility of the GGSN user interface.

Standards Update

Cisco GGSN Release 6.0 conforms to the latest relevant 3GPP Release 98, Release 99, Release 4, and Release 5 specifications to levels indicated in Table 1.

Table 1. Cisco GGSN Release 6.0 3GPP Compliance

Area	Specification	Cisco GGSN Release			
		98	99	4	5
GPRS Stage 2	03.60	7.7.0	–	–	–
	23.060	–	3.14.0	4.7.0	5.9.0
Mobile Radio Interface Layer 3	04.08	7.14.0	–	–	–
	24.008	–	3.14.0	4.9.0	5.6.0
GTP Across Gn and Gp	09.60	7.9.0	–	–	–
	29.060	–	3.15.0	4.6.0	5.12.0
Interworking with Public Data Network	09.61	7.4.0	–	–	–
	29.061	–	3.11.0	4.6.0	5.9.0
Charging	12.15	7.1.0	–	–	–
	32.015	–	3.10.0	–	–
	32.215	–	–	4.4.0	5.7.0
QoS Concept and Architecture	23.107	–	3.9.0	4.6.0	5.7.0

Cisco GGSN Functional Interfaces Supported

Cisco GGSN Release 6.0 supports the following interfaces:

- **Gn**—GPRS Tunneling Protocol (GTP) tunnel (between Cisco GGSN and SGSN)
- **Gp**—PLMN to PLMN (between two GPRS networks)
- **Ga**—Interface to the charging gateway (GTP)
- **Gi**—IP networking, initially IPv4 (between Cisco GGSN and external data networks)

CISCO GGSN HARDWARE PLATFORMS

Cisco GGSN Release 6.0 is supported on the same platforms as Release 5.0. For a detailed description of the hardware platforms, please refer to the Cisco GGSN Release 5.0 data sheet at http://cisco.com/en/US/products/sw/wirelssw/ps873/products_data_sheets_list.html.

Cisco GGSN is supported on two standard Cisco routing platforms: high-end Cisco 7600 Series routers and the market-entry Cisco 7200 Series VXR routers. These platforms are unchanged from the normal routing platform except they require special Cisco IOS Software to run the Cisco GGSN function. An overview of the hardware platforms follows.

The Cisco 7600 Series is made up of high-performance routers deployed at the network edge, where performance, IP services, redundancy, and fault resiliency are critical. Combined with a central route processor and forwarding engine, the Cisco 7600 Series provides forwarding rates up to 400 millions of packets per second (mpps).

The Cisco 7600 Series is an outstanding choice for multiple applications. When combined with the Cisco 7600 MWAM and Cisco GGSN software, it delivers a high-performance, highly flexible, redundant platform for mobile service delivery. For more information about the Cisco 7600 Series, visit <http://www.cisco.com/go/7600>.

CISCO GGSN MWAM FOR 7600 SERIES

The Cisco MWAM is a Cisco IOS Software application module that can be installed in Cisco Catalyst® 6500 Series switches or Cisco 7600 Series routers (Figure 1). The module runs multiple instances of a Cisco application such as the Cisco GGSN. The Cisco MWAM card is required to run the GGSN application in a Cisco 7600 Series chassis. Cisco GGSN Release 6.0 is supported only on the Cisco MWAM-1G.

Figure 1. Cisco MWAM Card



CISCO 7200 SERIES WITH NPE-G1 PROCESSOR

The Cisco 7200 Series routers deliver exceptional performance, price, modularity, and scalability in a compact size with a wide range of deployment options. With processing speeds up to 400,000 packets per second, port adapters ranging from n x DS-0 to OC-12 and an unparalleled number of high-touch IP services, the Cisco 7200 Series is the ideal GGSN platform for smaller service providers. The Cisco GGSN software is supported only on the Cisco NPE-G1 Network Processing Engine.

ORDERING INFORMATION

Tables 2, 3, and 4 provide ordering information for Cisco GGSN Release 6.0.

Table 2. Cisco GGSN Release 6.0 Software on Cisco 7206 Routers

Product Code	Product Description
S72AW-12402XB	Cisco 7200 Series GGSN Series 6
S72AW-12402XB=	Cisco 7200 Series GGSN Series 6 spare
S72AK8W-12402XB	Cisco 7200 Series GGSN Series 6 (IPSec)
S72AK8W-12402XB=	Cisco 7200 Series GGSN Series 6 (IPSec) (spare)
S72AK9W-12402XB	Cisco 7200 Series GGSN Series 6 (3DES)
S72AK9W-12402XB=	Cisco 7200 Series GGSN Series 6 (3DES) (spare)

Product Code	Product Description
S72AUW-12402XB=	Cisco 7200 Series GGSN Series 5 to Series 6 upgrade (spare)
S72AK8UW-12402XB=	Cisco 7200 Series GGSN Series 5 (IPSec) to Series 6 (IPSec) upgrade (spare)
S72AK9UW-12402XB=	Cisco 7200 Series GGSN Series 5 (3DES) to Series 6 (3DES) upgrade (spare)

Table 3. Cisco GGSN Release 6.0 Software for Cisco MWAM Card*

Product Code	Product Description
SC-SVC-GG60B	Cisco MWAM IOS GGSN Series 6 basic
SC-SVC-GG60B=	Cisco MWAM IOS GGSN Series 6 basic (spare)
FL-PREMUPG-GGSN=	Cisco MWAM IOS GGSN Series 6 upgrade basic to premium (spare)
FL-IMSV1-GGSN	Series 6 GGSN IMS V1 feature license per image
FL-IMSV1-GGSN=	Series 6 GGSN IMS V1 feature license per image (spare)
SC-SVC-GG60UBB=	Cisco MWAM GGSN upgrade from Series 5 to Series 6 (spare)
SC-SVC-GG60BIM	Cisco MWAM GGSN Series 6 basic (single IM)
SC-SVC-GG60BIM=	Cisco MWAM GGSN Series 6 basic (single IM) (spare)
FL-PREMUPSIM-GGSN=	Cisco MWAM GGSN Series 6 single image upgrade base to premium (spare)
SC-SVC-GG60UBBIM=	Cisco MWAM GGSN upgrade from Series 5 to Series 6 (single IM) (spare)
WS-SVC-MWGG60-BDL	Cisco MWAM (1G) Series GGSN Series 6 base unit bundle
WS-SVC-MWGG60-BDL=	Cisco MWAM (1G) Series GGSN Series 6 base unit bundle (spare)
FL-PRMUP-BUN-GGSN=	Cisco MWAM (1G) GGSN Series 6 bundle upgrade to premium (spare)

* Chassis and Cisco MWAM hardware must be ordered separately.

Table 4. Base and Premium Included Features

Base License Features	Premium License Features
Standards update	PSD Auto-Retrieval support
GTP SLB: IMSI stickiness	Virtual APN enhancement: real APN selection using RADIUS
MIB enhancements to support Cisco GGSN 6.0 features	Support of new information sent by SGSN such as RAT, User Location Info, etc.
	HSDPA support
	CLI enhancements: show PDP context filtered by MSDISN, or IMSI, or MS IP address
	CLI enhancements: display the MSISDN in the show pdp context all display
	CLI enhancements: use of MSISDN to filter debug command
	Enhancement to GGSN MIB: add MISISDN and APN in the PDP trap
Special License Feature (on top of the Premium License)	
Proxy-CSCF Discovery for IMS Support	

SERVICE AND SUPPORT

Cisco Systems is unmatched in the breadth and depth of its access to resources, shared intellectual capital, and leading data and telecommunications products and expertise. This combination helps Cisco provide the highest quality available in carrier-class support, solutions, and vision for its service provider customers. Cisco service and support solutions enhance the value of your investment in your network infrastructure, resulting in an overall reduced cost of doing business. Now, with the backing of world-class support and service, you can deliver fully on the promise of internetworking technology.

FOR MORE INFORMATION

For more information about Cisco mobile wireless products, including Cisco Mobile Exchange, go to <http://www.cisco.com/go/mobile>.



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