

## Cisco Enhanced Gateway GPRS Support Node (eGGSN)

The Cisco® Enhanced Gateway GPRS Support Node (eGGSN) is a high-performance data gateway enabling advanced wireless data service for mobile wireless Service Provider. The Cisco enhanced GGSN is a scalable, high-performance, resilient system build on industry-leading Cisco 7600 Edge Router platform and Cisco Internetworking Operation System (IOS).

On top the 3GPP GGSN functionality the Cisco eGGSN provides advanced Service Awareness, QoS, Policy Control and versatile billing capabilities to provide carrier-class access to Consumer, Multimedia Services as well as secured access to Corporate services.



**Table 1.** Features and Benefits

Feature	Overview	Feature	Overview
Platform	<ul style="list-style-type: none"> <li>Industry Leading high end 7600 series Edge platform</li> <li>Scalability from 4 to 13 slots</li> <li>Up to 720 Gbps backplane capacity</li> <li>High-availability with stateful failover</li> <li>Redundant AC or DC power</li> </ul>	Access Features	<ul style="list-style-type: none"> <li>GTPv0 and GTPv1 support</li> <li>3GPP compliant interfaces: Gn, Ga, Gi, Gp</li> <li>IPv4, IPv6 and PPP PDP type</li> <li>Transparent, non transparent and anonymous access</li> </ul>
	APN Features		<ul style="list-style-type: none"> <li>Per-APN and per-customer routing tables</li> <li>Highly customizable APN settings</li> <li>Virtual APN (Single APN) capability</li> <li>Multi-APN in same VRF</li> <li>RADIUS-based (dynamic) per-user APN assignment</li> </ul>

Security	<ul style="list-style-type: none"> <li>• RADIUS Authentication</li> <li>• Traffic separation (Gn, Gi, Ga, etc.)</li> <li>• Anti-spoofing</li> <li>• Traffic redirection</li> <li>• Packet Filtering, Firewalling</li> <li>• Content Filtering</li> </ul>	Service Control within Single APN or Multi-APN	<ul style="list-style-type: none"> <li>• Service-based forwarding</li> <li>• Advanced Service charging</li> <li>• Protocol-aware event differentiation for WAP1, WAP2, Streaming (RTSP), Email (POP3, IMAP, SMTP), iMode, HTTP, and FTP.</li> </ul>
Flexible Service classification for Access Control, Pre-paid and Post-paid charging	<ul style="list-style-type: none"> <li>• Protocol &amp; Application Matching/Mapping                             <ul style="list-style-type: none"> <li>◦ URL Regular Expression</li> <li>◦ HTTP (and WAP2) Header</li> <li>◦ Server address</li> <li>◦ Netmask</li> </ul> </li> <li>• Services can be tied to specific VLANs and VRFs</li> <li>• Multiple billing plans are supported, separated by subscriber group.</li> <li>• Billing plan assignment to a subscriber is dynamic, either from the AAA or from the Online Charging System, thereby providing considerable flexibility in subscriber provisioning.</li> <li>• Overall connection tracking is also supported, with the ability to disconnect the user upon connection allowance expiration or idle time</li> </ul>	Service charging based on Event, Volume, or Duration	<ul style="list-style-type: none"> <li>• Generation of standard G-CDR and Service /Event/Content CDR</li> <li>• Ga/GTP' support compliant to 3GPP</li> <li>• Configurable charging reconciliation triggers</li> <li>• Volume/Time trigger</li> <li>• Roaming/QoS/Location trigger</li> <li>• Additional flexible triggering</li> <li>• DCCA-based dynamic control, prepaid quota management, and reporting</li> <li>• Per-user billing plans and service control</li> <li>• User-messaging support (via redirection) for Account Top-Up, Advice of Charge, etc</li> <li>• Service-level or Transaction-level CDR reporting</li> <li>• Automatic event failure refunding</li> <li>• Time-based tariff change</li> <li>• Quota pullback (useful for redistributing quota)</li> </ul>
IP address management	<ul style="list-style-type: none"> <li>• Static address (provisioned in HLR)</li> <li>• Local address pools</li> <li>• Remote allocation via RADIUS or DHCP</li> <li>• Stateless auto-configuration for IPv6</li> <li>• Overlapping address support</li> </ul>	IMS (IP Multimedia Support)	<ul style="list-style-type: none"> <li>• IPv6 PDP support</li> <li>• P-CSCF discovery for IPv4 and IPv6</li> <li>• Peer to peer charging for offered (provisioned) Services such as SIP-based Video Sharing</li> </ul>
VPN and Corporate access	<ul style="list-style-type: none"> <li>• Overlapping address and VRF support</li> <li>• GRE VPN</li> <li>• PPP-regeneration and L2TP</li> <li>• Routing Behind MS</li> <li>• VLAN (802.1q)</li> <li>• IPSec VPN</li> <li>• MPLS VPN</li> </ul>	Availability	<ul style="list-style-type: none"> <li>• PDP context stateful failover</li> <li>• Routing/Switching Engine stateful failover</li> <li>• Online Insertion and Removal of Supervisor and MWAM</li> <li>• 99.999% availability</li> </ul>
Capacity (per chassis max)	<ul style="list-style-type: none"> <li>• Up to 2 million PDPs per chassis</li> <li>• 4000 transactions per second</li> <li>• 6000 APNs</li> <li>• 32,000 IPSec tunnels</li> <li>• Capacity is dependent on traffic profile and network configuration. Consult your Cisco representative for dimensioning assistance specific to your network.</li> </ul>	Management	<ul style="list-style-type: none"> <li>• Standard MIB and SNMP support</li> <li>• Maintenance mode</li> <li>• Enhanced Software Upgrade</li> <li>• Domain-level management including provisioning, fault, and performance mediation application with Cisco Mobile Wireless Center</li> </ul>

### Network Management

Network management functions provide mechanisms to support operations, administration, and maintenance (OA&M) functions related to the Cisco eGGSN. The Cisco eGGSN management has a wide range of console and SNMP management tools designed to reduce operational costs. The Cisco GGSN is supported by the Cisco MWC, which helps enable remote fault management, APN management, and configuration management for the Cisco eGGSN. The Cisco MWC is a suite of element-management-system (EMS) applications that enhance the delivery of new mobile wireless services. Based on CiscoWorks, the Cisco MWC addresses the element management requirements of mobile operators and provides fault, configuration, accounting, performance, and security (FCAPS) functions as mobile operators transition their service delivery networks from 2G

circuit-based traffic to 2.5G and 3G IP-based services. For more details about the Cisco MWC, go to: <http://www.cisco.com/en/US/partner/products/sw/netmgtsw/ps820/index.html>.

### **Reliability and Availability**

The Cisco eGGSN provides for Stateful Session Redundancy providing for continuation of user sessions as well as redundancy of prepaid quota and charging information, thereby providing for tremendous protection from single-node outages. Additionally, Cisco offers the PSD (Persistent Storage Device for protection of charging information against failure of the Charging Gateway or the Service Control System (prepaid usage).

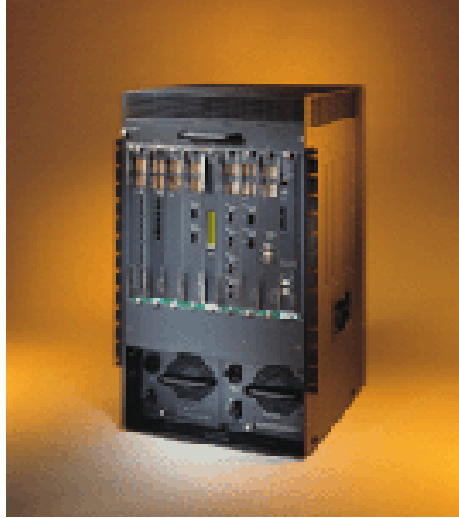
### **Scaling**

The Exchange Director capability within the Cisco Mobile Exchange provides for distribution of PDP context among a Cisco GGSN server farm. By presenting a single VIP to the SGSNs, the Exchange Director capability allows for transparent scaling of the GGSN server farm as well as load distribution. In addition to providing for transparent server farm expansion, portions of the server farm can be taken out of service for maintenance or upgrade while the rest of the farm services the subscriber community. Exchange Director's Dynamic Feedback Mechanism is used to monitor Cisco GGSN load, yielding adaptive distribution adjustments for new PDP contexts. Also, PDP Context rejections due to CAC QoS negotiation failures can be reassigned to another GGSN, providing for better utilization of QoS pools. Probe capability can be used to test for infrastructure availability so that user traffic can be routed via paths with full service availability.

### **CISCO eGGSN HARDWARE PLATFORMS**

The Cisco 7600 Series Router is a high-performance router deployed at the network edge, where performance, IP services, redundancy, and fault resiliency are critical. The versatile Cisco 7600 Series system scales WAN connectivity from OC-48/STM-16 to DS-0 and LAN connectivity from 10 Gigabit Ethernet through 10-Mbps Ethernet. The Cisco 7600 Series delivers these capabilities while implementing high-touch, hardware-accelerated IP services through the Cisco Parallel Express Forwarding (PXF) network processor.

The Cisco 7600 Series delivers up to 13 slots of optical LAN, WAN, and metropolitan-area network (MAN) networking at the network edge, helping enable service providers to offer high-value, Differentiated Services. It provides mobile service providers with the ability to deploy the advanced network infrastructure necessary to succeed in demanding, high-traffic environments. The Cisco 7600 Series enhanced chassis delivers design improvements that incorporate redundant, tiered-speed fan trays with configurable options for route processor, switch fabric, and power supply redundancy.



The Cisco 7600 Series routers accommodate a broad selection of line cards supporting numerous applications.

**Table 2 – 7600 Line Card Overview**

Module	Line Card Technology
<b>Optical Services Modules (OSM)</b>	OC-3/STM-1 OC-12/STM-4 OC-48/ STM-16 packet over SONET (POS) OC-12/STM-4 ATM Gigabit Ethernet WAN Channelized T3 (CT3) OC-12/STM-4
<b>FlexWAN Modules</b>	Supports WAN port adapters for DS-0 to OC-3
<b>LAN Ethernet Modules</b>	10/100 Mbps Gigabit Ethernet 10 Gigabit Ethernet
<b>Services Modules</b>	Firewall, network analysis, content switching, and Secure Sockets Layer (SSL), providing the foundation for a powerful combination of speed and services

The Cisco 7600 Series Router is an outstanding choice for multiple applications. When combined with the Cisco 7600 Multiprocessor WAN Application Module (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>.

### SERVICE AND SUPPORT

Using the Cisco Lifecycle Services approach, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed, by technology and by network complexity, to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

**FOR MORE INFORMATION**

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

**Ordering Information**

To place an order, visit the Cisco Ordering Home Page.



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