

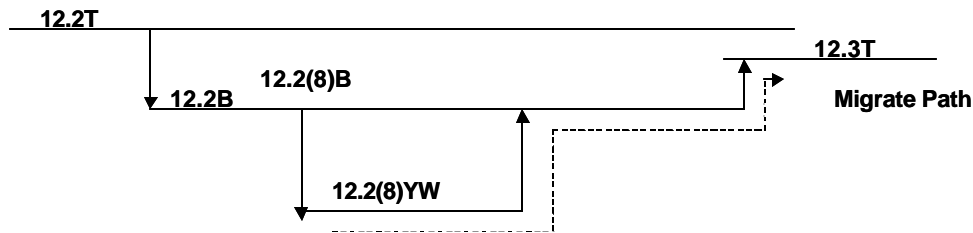


Cisco IOS Software Release 12.2(8)YW

Introduction

This Product Bulletin describes the content and delivery information concerning Cisco IOS™ software release 12.2(8)YW. It should be used in conjunction with Product Bulletin titles, Cisco IOS Software Release 12.2(8). 12.2(8)YW is a release supported on the Cisco 7206VXR/NPE-400 platform with 512MB DRAM. This release contains all the features supported in the earlier GGSN release 12.2(8)B1.

Given below is the release migration diagram depicting the collapse of 12.2(8)YW into the mainline T train:



New Features in Cisco IOS Release 12.2(8)YW

The following features will be delivered in the initial release of 12.2(8)YW. . Release 4.0 makes the GGSN 3G/UMTS capable and supports both 2.5G and 3G functionality in the same GGSN. In addition to the following new features, this release also includes enhanced performance to improve the PDP context activation rate.



Table 1. Cisco IOS Release 12.2(8)YW New Features

Features	Cisco 7206VXR
Support for GTPv1 & GTPv0	X
Full UMTS QoS	X
R99 Charging	X
MIB/SNMP Management for 2.5G/3G	X
2.5G/3G Interworking	X
Full Backward Compatibility [All Release 3.0 Features]	X

Detailed Information

Support for GTPv0 and GTPv1

GPRS Tunneling Protocol (GTP) is the protocol used between SGSN and GGSN to tunnel various data protocols through the GPRS backbone. In addition to supporting GTPv0 for 2.5G (GPRS), this feature allows the GGSN to be UMTS R99 compliant with respect to the GTP protocol (called GTPv1 per the 3GPP R99/UMTS standards specification).

Full UMTS QoS

UMTS R99 defines 4 QoS classes based on Traffic class. GGSN 4.0 will support all the 4 QoS classes.

R99 Charging

Allows the GGSN to be UMTS R99 compliant with respect to charging. Compliance levels supported in this release are:

- R99: Per 3.7.0 of 3GPP TS # 32.015 till Dec 2001
- R98: Per 7.6.0 of 3GPP TS # 12.15

Also as a new addition in GGSN release 4.0, the MSISDN option in G-CDR is supported.



MIB/SNMP Management for R99

Provide the MIB and agent feature to manage R99 features within GGSN 4.0. New MIBs are supported in GGSN R4.0 for GTP, GGSN, QoS, Charging, and ACC-PT MIBs.

Interworking between 2.5 and 3G networks

Full interoperability between 2.5G GPRS and 3G GPRS networks will be supported. The following specific functionality will be supported for the 2.5G/3G Interworking:

- GGSN interworking with 2.5G SGSN
- GGSN interworking with 3G SGSN
- GGSN interworking with RA update from 2.5G SGSN to 2.5G SGSN
- GGSN interworking with RA update from 3G SGSN to 3G SGSN
- GGSN interworking with RA update from a 2.5G SGSN to a 3G SGSN
- GGSN interworking with RA update from a 3G SGSN to a 2.5G SGSN
- GGSN with R97/R98 QoS attribute converted to R99 attribute
- GGSN with R99 QoS attribute converted to R97/R98 attribute
- GGSN with R97/R98 Ga support
- GGSN with R99 Ga support
- GGSN with MIBs for GPRS (2.5G) and UMTS (3G)

Full Backward Compatibility

All GGSN R3.0 features will be supported in GGSN R4.0. . These features are described below:

L2TP Extension on Gi for PPP PDP Type

GPRS Tunneling Protocol (GTP) is the protocol used between SGSN and GGSN to tunnel various data protocols through the GPRS backbone. The PPP PDP type traffic from MS is processed at the GGSN, where the PPP sessions are terminated. The GGSN then transports the traffic over L2TP and then routes over Gi, to their destination. This feature requires the MS to support PPP PDP type.

PPP PDP Type terminated in GGSN

GPRS Tunneling Protocol (GTP) is the protocol used between SGSN and GGSN to tunnel various data protocols through the GPRS backbone. The MS can send IP traffic encapsulated as PPP sessions all the way to GGSN, where the PPP sessions are terminated, and the IP packets are routed as IP Packets over Gi, by GGSN to their destination. This feature requires the MS to support PPP PDP type.

QoS Mapping per standards for GTPv0

In addition to new full QoS support for UMTS, GGSN 4.0 also supports for GTPv0, mapping of GPRS QoS classes to IP QoS classes (air to wireline). New QoS mapping based on delay class (compliant to UMTS) is supported. Resulting QoS classes mapped to Diffserv classes. The canonical QoS mapping supported in GGSN 3.0 is still supported for GTPv0 in GGSN 4.0.



Duplicate IP Address Protection (also known as PLMN Address Protection)

This feature also known as PLMN address protection, allows the GGSN to be configured with a specific address range (i.e. the PLMN IP addressing plan), and the GGSN will reject the PDP creation if the MS address belongs to the specified range.

Dynamic Echo Timer

In the previous releases, the retransmission scheme used for the GTP Echo messages is using the usual T3-timer and N3-Request. However according to the standard if a path failure is detected (i.e. no Echo Response after N3 Echo Request) on the Echo Request message, all PDP context related to this path shall be deleted. This feature allows the GGSN to use a dynamic timer for the Echo Request message. To avoid having a large number of PDP contexts to be deleted because of a network congestion between the GSNs, the dynamic echo timer takes into account the Round Trip Time (RTT) between GSNs.

PPP Regeneration (L2TP on Gi)

This feature allows the GGSN to regenerate a PPP session and forward the PPP frames within L2TP tunnels on Gi. Targeted for corporate users, the GGSN can be seamlessly integrated in a VPDN L2TP infrastructure.

Virtual APN Support

The virtual APN concept allows provisioning of one APN per type of access, one for corporate, one for ISP, etc. The selection of the "real" network is made using a structured username entered by the users. As an example, for corporate access the user will enter as username "login@domain". Where domain indicates the corporate (e.g. cisco.com). Upon PDP context activation the GGSN will select the target corporate using this username and not the APN.

Enhanced Security Feature Support

- (i) Source IP spoofing protection (also called Anti-spoofing feature): This feature allows the operator to prevent source IP address spoofing and protects the network from malicious attacks by unauthorized users.
- (ii) PLMN Network Protection from MSs: This feature allows the operator to protect their PLMN by dis-allowing MS traffic to the destination IP address range that falls within or coincides with the PLMN's IP address range.
- (iii) Steer MS to MS traffic: This feature allows steering of MS to MS traffic to a specific external network element instead of allowing the traffic to loop through the GGSN. This is for firewall filtering and to enable external billing.

Route Aggregation

In GPRS release 1.4 a static route for the MS was created in the GGSN after each PDP context activation. Each route, has indeed an impact on the capacity of the GGSN. In GGSN 4.0 release, to scale and support more PDP contexts, an aggregate route can be used to handle user data packets for multiple PDP contexts (instead of a host route for each PDP context). Using this feature, MS host routes with the same prefix will be aggregated into one route.

CEF Switching

This feature adds Cisco Express Forwarding enhanced Layer 3 switching technique to the GGSN. Basically, CEF switch is to switch the packet out in the receive handler, it will avoid the delay incurred due to enqueueing/ dequeuing. CEF avoids the potential overhead of continuous cache churn by instead using a Forwarding Information Base (FIB) for the destination switching decision which mirrors the entire contents of the IP routing table. i.e. there is a one-to-one correspondence between FIB table entries and routing table prefixes; therefore no need to maintain a route-cache.



VRF Based VPN Switching

Virtual Routing Function feature allows traffic to be switched to a destination VPN. This will enable GGSN with true VPN support with redundant interfaces. This feature supports routing protocols per APN. Each VRF is a virtual router in GGSN and can map to an APN. This provides flexibility to connect to a corporate network, and still satisfy the destination networks that are unique to each corporate. Benefits of using VRF also include:

- Security (traffic separation and isolation)
- Reliability and Scalability (multiple interfaces can be supported in one VRF)
- Flexibility (can use policy and address space independently)

Charging for Roamers

This feature enables the operators to charge the roamers based on the matching of MNC/MCC id and the IMSI/MSISDN address.

GTP SLB Support for GTPv0 and GTPv1

The GTP Server Load Balancing (SLB) features allows to truly distribute the PDP context creation between multiple GGSNs. The load-balancing mechanism actually uses the load of each GGSN to do the load balancing. It is to be noted that GTP SLB function will run on a separate hardware platform (be it 7200 or 7600/6500 or other suitable platform). 7200 and 7100 images are supported on 12.1(14)E. This is the first SLB release, which will have GTPv1 support to use in conjunction with GGSN R4.0. Cat6k images are supported on IOS version 12.1(13)E3. The URL for the IOS release notes for 12.1 on Cat6500 and 7600 is

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/12_1e/ol_2310.htm

Specific release notes for 12.1(13)E3 are directly linked from above, but for reference it is:

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/12_1e/ol_2310.htm#811903

Network Initiated PDP Context Support

GGSN R4.0 supports GTP Location Management Messages for Network-Requested PDP Context Activation procedure via a GTP-MAP protocol-converting GSN. Static PDP context information for IP address to IMSI mapping need to be configured on GGSN for the support.

RADIUS Support/Enhancements

The following Radius features are supported in GGSN 4.0:

1. Complete 3GPP attribute support as per 29.061 specification
2. Per PDP Accounting for GTPv1 sessions including accounting for Secondary PDPs
3. Suppression of Radius attributes



- i. 3GPP-IMSI
 - ii. 3GPP-SGSN-Address
 - iii. 3GPP-QoS-Negotiated
4. Support Anonymous access
5. Support of VRF aware Radius groups
6. RADIUS Class Attribute
7. Session idle timer (on top of session idle timer per APN)
8. Wait Accounting
9. Miscellaneous

Brief explanation of key Radius features from the above list is provided below:

Support anonymous access

Allow to support RADIUS authentication when only handset are used (e.g. GPRS WAP phones). Default username and password configured per APN on the GGSN

RADIUS Class Attribute

GGSN R3.0 supports the RADIUS Class attribute (#25). This attribute is sent upon authentication, within the Access-Response message by the RADIUS server to the GGSN. The Class attribute received in the authentication response of Primary PDP context is sent in all the accounting messages of Secondary PDP context.

Session Idle Timeout Timer (configurable per APN)

GGSN support for radius attributes for session/ idle timeout on a per session basis. In GGSN 1.4 the idle timer granularity is at the GGSN level. Idling PDP contexts are deleted when the timer expires GGSN 4.0 provides a per session idle timer. The granularity of support is:

- per session based on RADIUS attribute
- configurable, per APN
- configurable, per GGSN

Wait Accounting

Another key Radius enhancement supported is the 'Wait-accounting' feature which enables GGSN to wait for the accounting response from Radius server before sending back Create PDP Context Response message.

Miscellaneous

Other Radius enhancements were made in the GGSN release 3.0 will be supported in GGSN 4.0 also, such as supporting new CLI, and allowing authentication and accounting using the new server group commands, and also have the ability to enable accounting in the transparent mode.



For more detailed information about the platform and features being delivered in 12.2(8)YW release, please reference the following release notes document:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122relnt/7000/rn7000yw.htm>

Support

Cisco IOS software release 12.2(8)YW follows the standard Cisco support policy as indicated in the following link:

<http://www.cisco.com/warp/public/437/27.html>



Product Numbers

Table 2. Cisco IOS Release 12.2(8)YW Feature Sets, Images, Descriptions and Memory Requirements:

Platform	Product Code	Software Description	Image	Flash	DRAM
7206 VXR/ NPE-400	S72AW-12208YW	GATEWAY GPRS SUPPORT NODE (BASE)	c7200-g6is-mz.1228.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK8W-12208YW	GATEWAY GPRS SUPPORT NODE (DES)	c7200-g6ik8s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK9W-12208YW	GATEWAY GPRS SUPPORT NODE (3DES)	c7200-g6ik9s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AW-12208YW=	GATEWAY GPRS SUPPORT NODE (BASE)	c7200-g6is-mz.1228.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK8W-12208YW=	GATEWAY GPRS SUPPORT NODE (DES)	c7200-g6ik8s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK9W-12208YW=	GATEWAY GPRS SUPPORT NODE (3DES)	c7200-g6ik9s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AWUA-12208YW=	UPGRADE FROM 1.4 TO 4.0 (BASE)	c7200-g6is-mz.1228.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK8WUA-12208YW=	UPGRADE FROM 1.4 TO 4.0 (DES)	c7200-g6ik8s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK9WUA-12208YW=	UPGRADE FROM 1.4 TO 4.0 (3DES)	c7200-g6ik9s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AWUB-12208YW=	UPGRADE FROM 3.0 TO 4.0 (BASE)	c7200-g6is-mz.1228.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK8WUB-12208YW=	UPGRADE FROM 3.0 TO 4.0 (DES)	c7200-g6ik8s-mz.122-8.yw	48 MB	512MB
7206 VXR/ NPE-400	S72AK9WUB-12208YW=	UPGRADE FROM 3.0 TO 4.0 (3DES)	c7200-g6ik9s-mz.122-8.yw	48 MB	512MB

Download Information

Customers can download Cisco IOS Software Release 12.2(8)YW software from Cisco.com in the software image library: <http://www.cisco.com/kobayashi/sw-center/sw-ios.shtml>.



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