



The Ordering Information for the Mobile Wireless Packet Data Serving Node (PDSN) and Home Agent (HA) Release 1.2

Cisco IOS Early Deployment Release 12.2(8)ZB

Introduction

This Product Bulletin describes the content and delivery information concerning Cisco IOS™ software release 12.2(8)ZB. It should be used in conjunction with Product Bulletin, Cisco IOS Software Release 12.2(8)T. It should be noted that 12.2(8)ZB is a short-lived Early Deployment (ED) release parented to 12.2(8)T and supporting Cisco 7206VXR, 7600, and Catalyst 6500 platforms. The 7600 and 6500 utilizes the Multi-Processor WAN Application Module (MWAM).

12.2(8)ZB is also known as PDSN and HA Release 1.2 (R1.2) The initial release of images on 12.2(8)ZB will be for the 6500 platform. 12.2(8)ZB will be rebuilt to 12.2(8)ZB1 with support for the 7206VXR and 7600 platforms. The images for the 7600 and 6500 platforms are bundled images that include the 12.2(8)ZB image and a platform image.

This Product Bulletin should be used together with the Product Bulletin for 12.2(14)ZA which covers the Catalyst 6500 Supervisor Image that must be utilized when a 7600 or 6500 is configured as a PDSN and/or HA.

The Packet Data Serving Node (PDSN) and Home Agent (HA) provide the primary wireless mobile data access to the internet and intranets utilizing CDMA2000 Radio Access Network environment. The Cisco PDSN supports 1xRTT transport capability at up to 144kbps and the evolution standard of 1xEV-DO which provides a data rate up to 2Mbps. Actual performance will vary depending on the particular network configuration, per session data, equipment utilized, etc.

A PDSN provides access to the Internet, intranets and applications servers for mobile stations utilizing a cdma2000 Radio Access Network (RAN). The PDSN acts as an access gateway. It provides simple IP and mobile IP access, foreign agent support, and packet transport for virtual private networking. It also acts as a client for Authentication, Authorization, and Accounting (AAA) servers. Cisco's PDSN provides mobile stations with a gateway to the IP network. Mobility differentiates Cisco's PDSN from the traditional routed network. With PDSN the mobile node can move around therefore there must be a means by which packets can be forwarded to it. Cisco's PDSN solution offers a secure way to provide packet data services to mobile stations.

An HA is the anchor point for mobile terminals for which MobileIP or Proxy MobileIP services are provided. Traffic is routed via the HA. This solution provides roaming capabilities such that a mobile user can roam within and beyond its service provider boundaries, while always being reachable and addressable via the IP address assigned during establishment of the initial session.

Cisco's PDSN solution is made up of the PDSN, HA and Foreign Agent (FA) functionality, an Authentication, Authorization, and Accounting (AAA) server (the Cisco Access Registrar), and several security products and features. The ability to provide ubiquitous mobility limited only by the scope of the Internet can be enabled with the availability of mobile IP in IOS software. This protocol provides users the ability to roam through and beyond a home IP address.

Data services provided to the user through CDMA2000 network can be categorized into the following 4 types:

- Internet access through external ISP



- Corporate or private network (intranet) access
- WAP services
- Internet access through cellular operator who is also the ISP

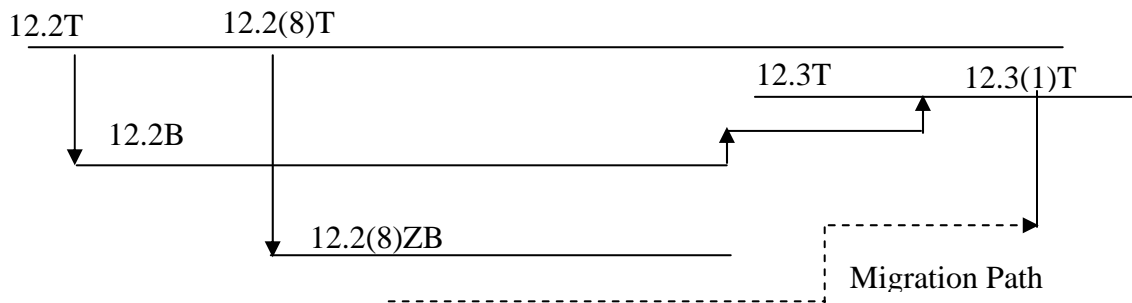
The User can access ISP services from the CDMA2000 network. There are 3 different protocol scenarios:

- Simple IP
- Mobile IP
- Proxy Mobile IP

All three scenarios can be supported with the Cisco PDSN and HA Release 1.2.

Migration Guide

Diagram 1 below displays Cisco 12.2(8)ZB release functionality relative to the 12.2T release. This diagram also identifies the recommended migration path.



New Major Features in Release 1.2

PDSN R1.2

For further information on features and functionality of PDSN R1.2 reference the documents under the *Detailed Information* section.

PrePaid Billing

- PDSN to AAA server support of prepaid VSAs. Requires PBS integration from AAA server.
- Simple IP based service metering in real time. Includes Proxy Mobile IP and VPDN.
- Undifferentiated Mobile IP services in real time. “Undifferentiated” means that all the Mobile IP flows for a single user will be rated equally.
- Rating measurement based on data volume and/or call duration.

Static IPsec

- IPsec – available with hardware support only: SA-ISA on 7206, IPsec VPN module on 6500 or 7600
- Verified for PDSN (LAC) to LNS VPDN tunneling and PDSN/FA to HA tunneling
- Static IPsec only, CLI configuration

Controller / Member Clustering

- Controller acts as primary interface to PCF
- Redirects calls to member PDSNs



- Load balancing based on load, capacity of members
- Two Controllers, one operates in active mode, the other standby mode.
- Higher Reliability using HSRP (Hot Standby Routing Protocol) on the cluster controllers.
- Reduces inter-PDSN hand offs **Conditional Debugging**
- Options added to filter PDSN debug messages and show command output
- MSID and username debugging added for PDSN debugs.
- Added support for MSID filtering on a11 debug messaging.
- Limited support for IOS conditional debugging available for filtering of AAA, PPP, Radius and VPDN debugs – which also support events, packets, and error options.

Electronic Serial Number (ESN)

- Received as parameter a2 in R-P Session Setup Airlink record.
- Included as parameter A2 in accounting UDR – can be used for billing purposes.

1xEVDO

- EVDO service option received as parameter f5 in Active Start Airlink record.
- Added in accounting records as parameter F5.

Flow-Based Accounting

- Support of multiple flows per PPP session.
- Per IS-835, PDSN will generate separate accounting records (UDRs) for each flow to the AAA.
- A separate UDR is sent for each flow.
- Home IP address is used to uniquely distinguish each flow.

Scalability/Performance

*Additional performance data upon request. Please contact PDSN product management.

7206VXR

- 20,000 sessions maximum
- 160 CPS Simple IP calls
- 40 CPS Mobile IP calls

6500/7600

- 20,000 sessions maximum per processor; 80,000 sessions maximum per MWAM
- 1000 CPS Simple IP calls per cluster (2 MWAMs)
- 240 CPS Mobile IP calls per cluster (2 MWAMs)

HA R1.2

For further information on features and functionality of HA R1.2 reference the documents under the *Detailed Information* section.

HA Binding Update

- Used to trigger the release of idle Mobile IP sessions at the PDSN.
- Sending of the binding update message is configurable at the HA on a global basis.

HA Redundancy

- Configured to provide 1:1 redundancy.
- Two HAs are configured as active and standby mode, respectively, based on Cisco Hot Standby Routing Protocol (HSRP).
- No service disruption.



- Available with AAA IP address assignment only.

Scalability/Performance

7206VXR

- 235,000 bindings
- 160 binding/sec

6500

- 235,000 sessions maximum per processor; 1,175,000 per MWAM
- 160 bindings/sec per processor; 800 bindings/sec per MWAM

Images and Descriptions

Cisco Release Images and Memory Recommendations

7206VXR

There are two PDSN images available with R1.2 on the 7206VXR: the Base image and the Enhanced image. Each is available with and without DES3 encryption.

BASE IMAGE. 8k PPP session capacity. Includes basic feature set.

ENHANCED IMAGE. 20k PPP session capacity. Includes basic feature set plus controller/member cluster feature and prepaid feature.

There is one HA image available with R1.2 on the 7206VXR. This is available with and without DES3 encryption.

PDSN and HA images cannot be loaded on the same 7206VXR. Separate chassis are required.

Image Name	Description	Flash	DRAM
c7200-c5is-mz	PDSN Base Image	20MB	512MB
c7200-c6is-mz	PDSN Enhanced Image	20MB	512MB
c7200-c5ik9s-mz	PDSN Base Image with DES3 Encryption	20MB	512MB
c7200-c6ik9s-mz	PDSN Enhanced Image with DES3 Encryption	20MB	512MB
c7200-h1is-mz	HA Image	20MB	512MB
c7200-h1ik9s-mz	HA Image with DES3 Encryption	20MB	512MB

6500/7600

There is one PDSN bundled image available with R1.2 on the 6500 or 7600. Each bundled image contains five PDSN **enhanced** images that run on five different processors on the MWAM

There is one HA bundled image available with R1.2 on the 6500 or 7600. Each bundled image contains five HA images that run on five different processors on the MWAM.

PDSN and HA images cannot be loaded on the same MWAM. Separate MWAMs are required.

Bundled Image Name	Description	Flash	MWAM
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Bundled Image Name	Description	Flash	MWAM
c6svc-mwam-c6is-v12.bin	PDSN Image	40MB	512MB
c6svc-mwam-h1is-v12.bin	HA Image	40MB	512MB

There are specific Supervisor images that must be ordered when using PDSN and/or HA on the MWAM. Supervisor IOS Release image 12.2(14)ZA is required. Reference the Sample Configuration section for model numbers and the Detailed Information section for additional information.

Product Numbers and Descriptions

Cisco Release Product Codes, Feature Sets, and Descriptions

The spare product code is designated with '=' and should be ordered when moving to a different PDSN image, or when the platform hardware is not being ordering conjunction with the software.

7206VXR

These Product Codes should be utilized when ordering PDSN and HA R1.2 software to be installed on a 7206VXR platform.



Product Code	Software Feature Set	Description
S72PSB-12208ZB S72PSB-12208ZB=	Cisco 7200 Series IOS BASE PDSN	PDSN Base Image.
S72PUB-12208ZB=	Cisco 7200 Series IOS BASE PDSN UPGRADE	Upgrade from a previous PDSN release image (R1.0.2/R1.1) to the R1.2 PDSN Base Image.
S72PSBK9-12208ZB S72PSBK9-12208ZB=	Cisco 7200 Series IOS BASE PDSN 3DES	PDSN Base Image with 3DES encryption. SA-ISA hardware card <i>must</i> be ordered separately.
S72PIUK9-12208ZB=	Cisco 7200 Series IOS BASE PDSN UPGRD TO 3DES BASE	Upgrade from the R1.2 PDSN Base Image to the 3DES encryption-capable R1.2 Base Image. SA-ISA hardware card <i>must</i> be ordered separately. Requires that R1.2 PDSN Base Image already have been purchased.
S72PSC-12208ZB S72PSC-12208ZB=	Cisco 7200 Series IOS ENHANCED PDSN	PDSN Enhanced Image.
S72PUG-12208ZB=	Cisco 7200 Series IOS BASE PDSN UPGRD TO ENHANCED PDSN	Upgrade from the R1.2 PDSN Base Image to the R1.2 PDSN Enhanced Image. Requires that R1.2 PDSN Base Image already have been purchased.
S72PSCK9-12208ZB S72PSCK9-12208ZB=	Cisco 7200 Series IOS ENHANCED PDSN 3DES	PDSN Enhanced Image with 3DES encryption. SA-ISA hardware card <i>must</i> be ordered separately.
S72PICK9-12208ZB=	Cisco 7200 Series IOS ENH PDSN UPGRD TO ENH 3DES	Upgrade from the R1.2 PDSN Enhanced Image to the 3DES encryption-capable R1.2 Enhanced Image. SA-ISA hardware card <i>must</i> be ordered separately. Requires that R1.2 PDSN Enhanced Image already have been purchased.
S72PUGK9-12208ZB=	Cisco 7200 Series IOS BASE PDSN 3DES UPGRD TO ENH PDSN 3DES	Upgrade from the R1.2 PDSN DES3 Base Image to the R1.2 PDSN DES3 Enhanced Image. Requires that R1.2 PDSN DES3 Base Image already have been purchased.
S72PSH-12208ZB S72PSH-12208ZB=	Cisco 7200 Series IOS MWG HOME AGENT	MWG HA Image.
S72PHU-12208ZB=	Cisco 7200 Series IOS MWG HOME AGENT UPGRADE	Upgrade from a previous MWG HA release image (R1.0.2/R1.1) to the R1.2 MWG HA Image.
S72PSHK9-12208ZB S72PSHK9-12208ZB=	Cisco 7200 Series IOS MWG HOME AGENT 3DES	MWG HA Image with 3DES encryption. SA-ISA hardware card <i>must</i> be ordered separately.
S72PIHK9-12208ZB=	Cisco 7200 Series IOS MWG HOME AGENT UPGRD TO 3DES	Upgrade from the R1.2 MWG HA Image to the 3DES encryption-capable R1.2 MWG HA Image. SA-ISA hardware card <i>must</i> be ordered separately. Requires that R1.2 MWG HA Image already have been purchased.

These Product Codes should be utilized when ordering Cisco Software Application Support (SAS) for PDSN and HA R1.2 on the 7206VXR platform. Cisco SAS includes 24-hour technical assistance from the Cisco Technical Assistance Center



(TAC) via telephone and the Web, online tools, plus bug fixes, maintenance, and rebuilds of the same release (R1.2) of PDSN and/or HA .

Product Code	Description
CON-SAS-S72PSBZB	SAS support for PDSN Base Image. Support for product codes: S72PSB-12208ZB S72PSB-12208ZB=
CON-SAS-S72PSBKZB	SAS support for PDSN Base Image with IPSec. Support for product codes: S72PSBK9-12208ZB S72PSBK9-12208ZB=
CON-SAS-S72PIUKZB	SAS support for PDSN Base Image with IPSec when upgrading from the PDSN Base Image. Support for product codes: S72PIUK9-12208ZB=
CON-SAS-S72PSCZB	SAS support for PDSN Enhanced Image. Support for product codes: S72PSC-12208ZB S72PSC-12208ZB=
CON-SAS-S72PSCZB	SAS support for PDSN Enhanced Image with IPSec. Support for product codes: S72PSC9-12208ZB S72PSC9-12208ZB=
CON-SAS-S72PICKZB	SAS support for PDSN Enhanced Image with IPSec when upgrading from the PDSN Enhanced Image. Support for product codes: S72PICK9-12208ZB=
CON-SAS-S72PUGZB	SAS support for PDSN Enhanced Image when upgrading from the PDSN Base Image. Support for product codes: S72PUG-12208ZB=
CON-SAS-S72PUGKZB	SAS support for PDSN Enhanced Image with IPSec when upgrading from the PDSN Base Image with IPSec. Support for product codes: S72PUGK9-12208ZB=
CON-SAS-S72PSHZB	SAS support for MWG HA Image. Support for product codes: S72PSH-12208ZB S72PSH-12208ZB=
CON-SAS-S72PSHKZB	SAS support for MWG HA Image with IPSec. Support for product codes: S72PSHK9-12208ZB S72PSHK9-12208ZB=
CON-SAS-S72PIHKZB	SAS support for MWG HA Image with IPSec when upgrading from MWG HA Image. Support for product codes: S72PIHK9-12208ZB=



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These Product Codes should be utilized when ordering PDSN and HA R1.2 software to be installed on a MWAM on the 6500 or 7600 platform.

Product Code	Software Feature Set	Description
SC-SVC-PD12 SC-SVC-PD12=	Cisco MWAM Series PDSN	PDSN Bundled Image.
SC-SVC-HA12 SC-SVC-HA12=	Cisco MWAM Series HOME AGENT (PDSN)	MWG HA Bundled Image.

These Product Codes should be utilized when ordering Cisco Software Application Support (SAS) for PDSN and HA R1.2 on the 6500 and 7600 platform. Cisco SAS includes 24-hour technical assistance from the Cisco Technical Assistance Center (TAC) via telephone and the Web, online tools, plus bug fixes, maintenance, and rebuilds of the same release (R1.2) of PDSN.

Product Code	Description
CON-SAS-SVC-PD12	SAS support for PDSN Bundled Image. Support for product codes: SC-SVC-PD12 SC-SVC-PD12=
CON-SAS-SVC-HA12	SAS support for HA Bundled Image. Support for product codes: SC-SVC-HA12 SC-SVC-HA12=

Sample Configurations

The following configurations do not include hardware Smartnet contracts, or ancillary equipment such as cables and rack mount kits. Please discuss these items with your Cisco representative prior to ordering.

PDSN or HA R1.2 on 7206VXR

PDSN/FA operates on one 7206VXR. HA operates on a separate 7206VXR. PDSN and HA cannot be collocated on one, single box.

Following is the *recommended* hardware configuration for a 7206VXR to be ordered as a PDSN or HA R1.2.

Product	Description	Quantity
C7206VXR/400/2FE	7206VXR with NPE-400 and I/O Controller with 2 FE/E Ports	1
PWR-7200-DC+	Cisco 7200 DC Power Supply Option	1
PWR-7200/2-DC+	Cisco 7200 Dual DC Power Supply Option	1
MEM-I/O-FLD128M	Cisco 7200 I/O PCMCIA Flash Disk, 128 MB Option	1
MEM-NPE-400-512MB	512MB Memory for NPE-400 in 7200 Series	1
PA-FE-TX	1-Port Fast Ethernet 100BaseTx Port Adapter	2



S72-Pxxxxxx	PDSN or HA Image	1
CON-SAS-S72Pxxxx	SAS Support for PDSN or HA Image	1

Note: This is the configuration as tested in the Cisco lab. Any variations to this configuration should be discussed with your Cisco representative prior to ordering.

PDSN or HA R1.2 on 7206VXR with DES3 Encryption

The proper DES3 image and additional hardware is required to support IPSec on the PDSN or HA on 7206VXR.

One SA-ISA module is required per chassis. IPSec operation is supported only with hardware acceleration.

Following is the *recommended* hardware configuration for a 7206VXR to be ordered as a PDSN or HA R1.2 with DES3 encryption.

Product	Description	Quantity
C7206VXR/400/2FE	7206VXR with NPE-400 and I/O Controller with 2 FE/E Ports	1
PWR-7200-DC+	Cisco 7200 DC Power Supply Option	1
PWR-7200/2-DC+	Cisco 7200 Dual DC Power Supply Option	1
MEM-I/O-FLD128M	Cisco 7200 I/O PCMCIA Flash Disk, 128 MB Option	1
MEM-NPE-400-512MB	512MB Memory for NPE-400 in 7200 Series	1
PA-FE-TX	1-Port Fast Ethernet 100BaseTx Port Adapter	2
SA-ISA	Integrated Services Adapter for IPSec	1
S72PxxK9xxxx	PDSN or HA DES3 Image	1
CON-SAS-S72PxxxK9x	SAS Support for PDSN or HA DES3 Image	1

Note: This is the configuration as tested in the Cisco lab. Any variations to this configuration should be discussed with your Cisco representative prior to ordering.

PDSN or HA R1.2 on 6500

PDSN/FA operates on one MWAM. HA operates on a separate MWAM. PDSN and HA cannot be collocated on one, single MWAM.

Following is the *recommended* hardware configuration for a 6509 to be ordered as a PDSN or HA R1.2.

Product	Description	Quantity
WS-C6509-NEB	Catalyst 6509 Chassis for NEBS Environments	1
WS-CDC-2500W	Catalyst 6000 2500W DC Power Supply	1
WS-CDC-2500W/2	Catalyst 6000 Second 2500W DC Power Supply	1
WS-X6K-S2U-MSFC2	Cat6K Sup2 with 256MB DRAM on Sup2 MSFC2	1
MEM-C6K-ATA-1-64M	Cat 6500 Supervisor ATA Type1 Flash Mem Card, 64MB	1
MEM-S2UMSFC2-512MB	512MB DRAM Option On MSFC2	1
SC6SAV-12214ZA	Cisco Catalyst 6500 Ser IOS ENTERPRISE W/VIP	1
WS-X6K-S2U-MSFC2/2	Cat6K Red. Sup2 w/ 256MB DRAM, PFC2, MSFC2	1
MEM-C6K-ATA-1-64M	Cat 6500 Supervisor ATA Type1 Flash Mem Card, 64MB	1
MEM-S2UMSFC2-512MB	512MB DRAM Option On MSFC2	1
WS-SVC-MWAM-1	Multi-Processor WAN Application Module	1...6
SC-SVC-xxxx	Cisco MWAM Series PDSN or HOME AGENT (PDSN)	1...6
CON-SAS-SVC-xxxx	SAS Support for Cisco MWAM Series IOS HOME AGENT	1...6



WS-X6548-RJ45	Catalyst 6500 48-port 10/100, RJ-45, x-bar	1
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Depending on network configuration, a GE Interface card can be ordered instead of FE interface. In this case the following would be ordered instead of WS-X6548-RJ45:

Product	Description	Quantity
WS-X6408A-GBIC	Catalyst 6000 8-port GE, Enhanced QoS (Req. GBICs)	1
WS-G5484	1000BASE-SX Short Wavelength GBIC (Multimode Only)	8

Note: This is the configuration as tested in the Cisco lab. Any variations to this configuration should be discussed with your Cisco representative prior to ordering.

PDSN or HA R1.2 on 6500 with DES3 Encryption

The proper DES3 Supervisor Image and additional hardware is required to support IPSec on the PDSN or HA on 6500. The DES3 SUP2 image with PDSN Support is required.

One IPSec VPN security module is required per chassis. IPSec operation is supported only with hardware acceleration.

The same PDSN and HA images support both non-IPSec and IPSec; the VPN module is required.

Product	Description	Quantity
SC6SAK9-12214ZA	Cisco Catalyst 6500 Ser IOS ENTERPRISE W/VIP SSH DES3	1
WS-SVC-IPSEC-1	IPSec VPN Security Module	1

PDSN or HA R1.2 on 7600

PDSN/FA operates on one MWAM. HA operates on a separate MWAM. PDSN and HA cannot be collocated on one, single MWAM.

Following is the *recommended* hardware configuration for a 7609 to be ordered as a PDSN or HA R1.2.

Product	Description	Quantity
CISCO7609	7609 Chassis Bundles	1
7609-DC-BUN-2500W	Enhanced 7609 Chassis, SUP2/MSFC2, 2500W DC P/S, 512MB DRAM	1
WS-CDC-2500W/2	Catalyst 6000 Second 2500W DC Power Supply	1
S76AV-12214ZA	Cisco Catalyst 6500 Ser IOS ENTERPRISE W/VIP	1
WS-X6K-S2U-MSFC2	Cat6K Sup2 with 256MB DRAM on Sup2 MSFC2	1
MEM-C6K-ATA-1-64M	Cat 6500 Supervisor ATA Type1 Flash Mem Card, 64MB	1
MEM-S2UMSFC2-512MB	512MB DRAM Option On MSFC2	1
WS-SVC-MWAM-1	Multi-Processor WAN Application Module	1...6
SC-SVC-xxxxxxx	Cisco MWAM Series PDSN or HOME AGENT (PDSN)	1...6
CON-SAS-SVC-xxxx	SAS for Cisco MWAM Series IOS PDSN or HOME AGENT	1...6
WS-X6548-RJ45	Catalyst 6500 48-port 10/100, RJ-45, x-bar	1



Depending on network configuration, a GE Interface card can be ordered instead of FE interface. In this case the following would be ordered instead of WS-X6548-RJ45:

Product	Description	Quantity
WS-X6408A-GBIC	Catalyst 6000 8-port GE, Enhanced QoS (Req. GBICs)	1
WS-G5484	1000BASE-SX Short Wavelength GBIC (Multimode Only)	8

Note: This is the configuration as tested in the Cisco lab. Any variations to this configuration should be discussed with your Cisco representative prior to ordering.

PDSN or HA R1.2 on 7600 with DES3 Encryption

The proper DES3 Supervisor Image and additional hardware is required to support IPSec on the PDSN or HA on 7600. The DES3 SUP2 image with PDSN Support is required.

One IPSec VPN security module is required per chassis. IPSec operation is supported only with hardware acceleration.

The same PDSN and HA images support both non-IPSec and IPSec; the VPN module is required.

Product	Description	Quantity
S76AK9-12214ZA	Cisco Catalyst 6500 Ser IOS ENTERPRISE W/VIP SSH DES3	1
WS-SVC-IPSEC-1	IPSec VPN Security Module	1

Detailed Information

For more detailed information about the platforms and features being delivered in PDSN and HA R1.2, please reference the following documents:

<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122z/122zb8/index.htm>

For more detailed information about the Supervisor Image supporting PDSN and HA R1.2 on 6500, please reference the following documents:

http://www.cisco.com/univercd/cc/td/doc/product/lan/cat6000/re/notes/ol_3827.htm

http://www.cisco.com/en/US/partner/products/sw/iosswrel/ps1835/prod_bulletin09186a0080107f2c.html

Support

PDSN and HA R1.2 Cisco IOS software release 12.2(8)ZB follows the standard Cisco support policy as indicated in the following link:

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



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