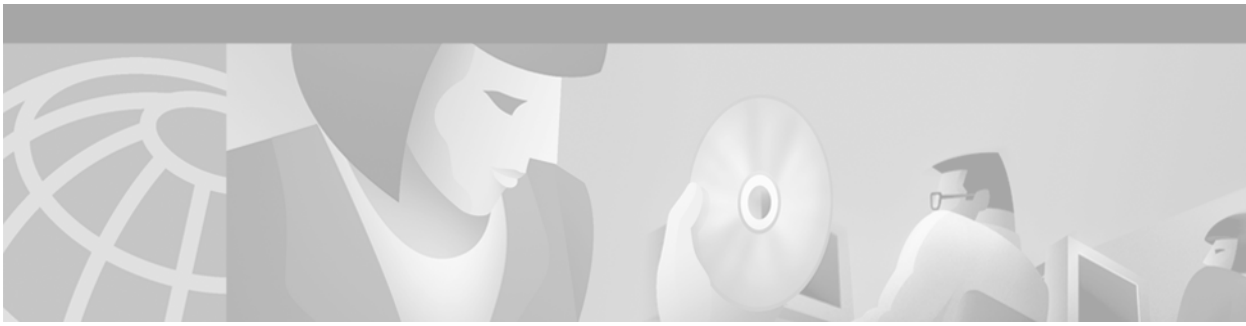

Release Notes for Cisco 6400 Carrier-Class Broadband Aggregator for Cisco IOS Release 12.2(2)B7

November 2002

Cisco IOS Release 12.2(2)B7

OL-2951-03

These release notes for the Cisco 6400 Carrier-Class Broadband Aggregator describe the enhancements provided in Cisco IOS Release 12.2(2)B7.

For a list of the software caveats that apply to Cisco IOS Release 12.2(2)B7, see the "Software Caveats" section on page 16, and *Caveats for Cisco IOS Release 12.2T.* The caveats document is updated for each maintenance release and is located on Cisco.com and the Documentation CD-ROM.

Contents

These release notes describe the following topics:

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System Requirements

This section describes the system requirements for Cisco IOS Release 12.2(2)B7 and includes the following sections:

Memory Recommendations

Table 1 lists the memory recommendations for the Cisco 6400 aggregator.

Table 1 Memory Recommendations for the Cisco 6400 Aggregator

Product Name	Software Module Description	Image Name	Recommended Minimum DRAM Memory	Recommended Minimum Flash Memory
NRP	Boot image	c6400r-boot-mz	—	—
NRP-2 and NRP-2SV	IOS NRP-2 base IOS NRP-2 mutlidomain IOS NRP-2 web selection	c6400r2sp-g4p5-mz	256 MB for up to 6500 sessions. 512 MB for over 6500 sessions.	—
NRP-1	IOS NRP-1 base IOS NRP-1 multidomain IOS NRP-1 web selection	c6400r-g4p5-mz	64 MB for up to 750 sessions. 128 MB for over 750 sessions.	8 MB
NSP		c6400s-wp-mz c6400s-html.tar	The standard 64 MB DRAM memory configuration supports up to 12K virtual circuits (VCs). 128 MB DRAM is recommended for supporting up to 32K VCs or for using ATM RMON or ATM Accounting. 128 MB DRAM is also recommended if you are upgrading from an earlier release to Cisco IOS Release 12.1(5)DB.	20 MB or 32 MB[1] 350 MB recommended for NRP-2 configurations

1. The 20-MB Flash disk is no longer available; the 32-MB Flash disk is now the default Flash configuration.

Note In most NRP-2 configurations, 256-MB DRAM is adequate for up to 6500 sessions. If you have more sessions, the requirement is 512-MB DRAM.

Note When you are running multicast in an NRP-2 configuration, the NRP-2 should have 512 MB of memory.

Note In most NRP-1 configurations, 64-MB DRAM is adequate for up to 750 sessions. If you have more sessions, you need 128-MB DRAM. If you are using the NRP-1, for an upgrade from an earlier release to Cisco IOS Release 12.2(2)B7, 128-MB DRAM is recommended.

Supported Hardware

Cisco IOS Release 12.2(2)B7 supports the Cisco 6400 NRP-1, NRP-2, NRP-2SV, NSP, and NSP-S3B modules. The NSP-S3B, otherwise identical to the NSP, is required if you want to use the Building Integrated Timing Supply (BITS) Network Clocking software feature.

Software Compatibility

For NRP-Service Selection Gateway (SSG) users, Cisco IOS Release 12.2(2)B7 works with the Cisco Service Selection Dashboard (SSD) Releases 2.5(1) and 3.0(1), and Subscriber Edge Services Manager (SESM) Release 3.1(1).

Determining the Software Version

To determine the version of Cisco IOS software currently running on the Cisco 6400 NRP, log in to the NRP and enter the **show version** EXEC command:

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) C6400R Software (C6400R-G4P5-M), Version 12.2(2)B7
```

To determine the version of Cisco IOS software currently running on the Cisco 6400 NSP, log in to the NSP and enter the **show version** EXEC command:

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) C6400 Software (C6400S-WP-M), Version 12.2(2)B7
```

The output from these commands includes additional information, including processor revision numbers, memory amounts, hardware IDs, and partition information.

Upgrading to a New Software Release

For information about upgrading software on the Cisco 6400 aggregator, including upgrading a single- or dual-NRP system to a new software release, see the *Cisco 6400 Software Setup Guide*. For general information about upgrading to a new software release, see the product bulletin *Cisco IOS Upgrade Ordering Instructions*.

Feature Set Tables

The Cisco IOS software is packaged in software images. Each image contains a set of Cisco IOS features.

Table 2 lists the features supported by the Cisco 6400 NRP images in this release. Table 3 lists the features supported by the Cisco 6400 NSP images in this release. These tables also include features supported by earlier releases.

Note Table 2 might not be cumulative or list all of the features in each image. For a list of the T-train features in this platform, refer to Feature Navigator. For more information about Feature Navigator, see the "Feature Navigator" section on page 25.

Table 2 Features Supported by the Cisco 6400 NRP in Cisco IOS Release 12.2(2)B7

Feature	NRP-1 Supported as of Cisco IOS Release	NRP-2 Supported as of Cisco IOS Release	NRP-2SV Supported as of Cisco IOS Release
Access Protocols			
Integrated Routing and Bridging (IRB)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Multilink Point-to-Point Protocol (MLPPP or MLP)	12.1(3)DC	12.1(4)DC	12.2(2)B1
Per-VC[1] Traffic Shaping	12.0(3)DC	—	12.2(2)B1
PPP[2] IPCP[3] Subnet Negotiation	12.0(5)DC	12.1(4)DC	12.2(2)B1
PPP over ATM[4] (PPPoA) Terminated	12.0(3)DC	12.1(4)DC	12.2(2)B1
PPP over Ethernet (PPPoE) Terminated	12.0(3)DC	12.1(4)DC	12.2(2)B1
PPPoA/PPPoE Autosense on ATM VC with SNAP[5] Encapsulation	12.1(1)DC	12.1(5)DC	12.2(2)B1
Remote Access into MPLS VPN	12.2(2)B	—	—
Routed Bridge Encapsulation (RBE)	12.0(5)DC	12.1(4)DC	12.2(2)B1
RBE Subinterface Grouping	12.1(4)DC	12.1(4)DC	12.2(2)B1
RBE Unnumbered DHCP[6]	12.1(1)DC	12.1(4)DC	12.2(2)B1
RBE with DHCP	12.0(5)DC	12.1(4)DC	12.2(2)B1
RBE with DHCP Option 82	12.1(5)DC	12.1(5)DC	12.2(2)B1
RFC 1483 Bridging	12.0(3)DC	12.1(4)DC	12.2(2)B1
RFC 1483 Routing	12.0(3)DC	12.1(4)DC	12.2(2)B1
Aggregation and Virtual Private Networks (VPNs)			
IP[7] Overlapping Address Pools (OAP)	12.1(5)DC	Not yet supported	Not yet supported
L2TP[8] Multi-Hop	12.1(1)DC	12.1(4)DC	12.2(2)B1
L2TP Tunnel Service Authorization Enhancement	12.1(1)DC	12.1(4)DC	12.2(2)B1
L2TP Tunnel Sharing	12.1(1)DC	12.1(4)DC	12.2(2)B1
L2TP Tunnel Switching[9]	12.1(1)DC	12.1(4)DC	12.2(2)B1
MPLS[10] Edge Label Switch Router (Edge LSR)	12.0(7)DC	Not yet supported	Not yet supported

Table 2 Features Supported by the Cisco 6400 NRP in Cisco IOS Release 12.2(2)B7 (continued)

Feature	NRP-1 Supported as of Cisco IOS Release	NRP-2 Supported as of Cisco IOS Release	NRP-2SV Supported as of Cisco IOS Release
MPLS Label Distribution Protocol	12.2(2)B	12.2(2)B	12.2(2)B1
MPLS Label Switch Controller (LSC) for BPX	12.0(7)DC	Not yet supported	Not yet supported
MPLS VPNs[11]	12.0(7)DC	12.2(2)B	12.2(2)B1
PPPoA Tunneled into L2TP	12.0(5)DC	12.1(4)DC	12.2(2)B1
PPPoE Tunneled into L2TP	12.0(5)DC	12.1(4)DC	12.2(2)B1
Remote Access into MPLS VPN	12.1(5)DC	Not yet supported	Not yet supported
RFC 1577	12.0(3)DC	12.1(4)DC	12.2(2)B1
VLAN[12] (ISL[13]) on NRP	12.0(3)DC	12.1(4)DC	12.2(2)B1
VLAN (802.1q) on NRP-2 GE[14]	—	12.1(5)DC	12.2(2)B1
Configuration and Monitoring			
ATM OAM Ping	12.2(4)B3	12.2(4)B3	12.2(4)B3
ATM PVC[15] Range Command	12.1(4)DC	12.1(4)DC	12.2(2)B1
Per VC Error Display	12.1(3)DC	12.1(5)DC	12.2(2)B1
Hardware Support			
ATM (OC-3, OC-12, DS3) Interfaces	12.0(3)DC	12.1(4)DC	12.2(2)B1
FE Interface: 10/100 Auto-negotiation, Auto-sensing	12.0(3)DC	—	—
GE Interface	—	12.1(5)DC	12.2(2)B1
Network Management Ethernet (NME)	12.0(5)DC	12.1(4)DC	12.2(2)B1
NRP 1+1 Redundancy	12.0(3)DC	Not yet supported	Not yet supported
IP and Routing			
Address Resolution Protocol (ARP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Border Gateway Protocol Version 4 (BGP4)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Enhanced Interior Gateway Routing Protocol (EIGRP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Generic Routing Encapsulation (GRE)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Internet Group Management Protocol (IGMP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Internet Protocol (IP) Forwarding	12.0(3)DC	12.1(4)DC	12.2(2)B1
IP Multicast	12.0(3)DC	12.1(4)DC	12.2(2)B1
IP QoS—Policing, Marking, and Classification	12.2(2)B	12.2(2)B	12.2(2)B1
Intermediate System-to-Intermediate System (IS-IS)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Network Address Translation (NAT) Support for NetMeeting Directory	12.0(3)DC	12.1(4)DC	12.2(2)B1
NetFlow for RFC1483 into MPLS VPN	12.1(5)DC	Not yet supported	Not yet supported
Open Shortest Path First (OSPF)	12.0(3)DC	12.1(4)DC	12.2(2)B1
PIM[16] Dense Mode and Sparse Mode	12.0(3)DC	12.1(4)DC	12.2(2)B1
Routing Information Protocol (RIP)/RIP v2	12.0(3)DC	12.1(4)DC	12.2(2)B1

Table 2 Features Supported by the Cisco 6400 NRP in Cisco IOS Release 12.2(2)B7 (continued)

Feature	NRP-1 Supported as of Cisco IOS Release	NRP-2 Supported as of Cisco IOS Release	NRP-2SV Supported as of Cisco IOS Release
Transmission Control Protocol (TCP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Telnet	12.0(3)DC	12.1(4)DC	12.2(2)B1
Trivial File Transfer Protocol (TFTP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Transparent Bridging	12.0(3)DC	12.1(4)DC	12.2(2)B1
User Datagram Protocol (UDP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Web Cache Coordination Protocol (WCCP) Version 1	12.0(3)DC	12.1(4)DC	12.2(2)B1
WCCP (v2)	12.0(7)DC	12.1(4)DC	12.2(2)B1
IP QoS			
IP QoS Dynamic Bandwidth Selection: IP Policing/Marking via CAR	12.2(2)B	12.2(2)B	12.2(2)B1
Network Management			
PPPoE Session Count MIB	12.2(2)B	12.2(2)B	12.2(2)B1
NRP: QoS			
Simple Network Management Protocol (SNMP) (v1, v2, and v3)	12.0(3)DC	12.1(4)DC	12.2(2)B1
SNMPv3 Proxy Forwarder	—	12.1(4)DC	12.2(2)B1
RADIUS/AAA			
Encrypted and Tagged VSA Support for RADIUS Attribute 91	12.2(4)B3	12.2(4)B3	12.2(4)B3
Enhancements to RADIUS VC Logging	12.2(4)B3	12.2(4)B3	12.2(4)B3
Extended Support for RADIUS Attribute 32	12.2(4)B3	12.2(4)B3	12.2(4)B3
Framed Route VRF Aware	12.2(4)B3	12.2(4)B3	12.2(4)B3
Password Authentication Protocol (PAP)/Challenge Handshake Authentication Protocol (CHAP)	12.0(3)DC	12.1(4)DC	12.2(2)B1
Per VRF AAA	12.2(4)B3	12.2(4)B3	12.2(4)B3
Remote Authentication Dial-In User Service (RADIUS)	12.0(3)DC	12.1(4)DC	12.2(2)B1
RADIUS Attribute 8 (Framed-IP-Address) in Access Requests (IP Hint)	12.1(3)DC	12.1(4)DC	12.2(2)B1
RADIUS-based Session/Idle Timeout for LAC	12.2(4)B3	12.2(4)B3	12.2(4)B3
Support for RADIUS Attribute 77	12.2(4)B3	12.2(4)B3	12.2(4)B3
Support for RADIUS Attributes 52 and 53	12.2(4)B3	12.2(4)B3	12.2(4)B3
Terminal Access Controller Access Control System Plus (TACACS+) (admin login only)	12.0(3)DC	12.1(4)DC	12.2(2)B1
VPI[17]/VCI[18] RADIUS Request and RADIUS Accounting for PPPoA	12.0(3)DC	12.1(5)DC	12.2(2)B1
VPI/VCI in RADIUS Request and RADIUS Accounting for PPPoE	12.1(1)DC	12.1(5)DC	12.2(2)B1

Table 2 Features Supported by the Cisco 6400 NRP in Cisco IOS Release 12.2(2)B7 (continued)

Feature	NRP-1 Supported as of Cisco IOS Release	NRP-2 Supported as of Cisco IOS Release	NRP-2SV Supported as of Cisco IOS Release
Scalability and Performance			
GRE Cisco Express Forwarding (CEF)	12.1(1)DC	12.1(5)DC	12.2(2)B1
LAC[19] CEF Switching	12.1(3)DC	12.1(4)DC	12.2(2)B1
L2TP Sessions per Tunnel Limiting	12.1(1)DC	12.1(4)DC	12.2(2)B1
NAT CEF Switching	12.1(1)DC	12.1(4)DC	12.2(2)B1
Per VC Buffer Management	12.1(1)DC	12.1(4)DC	12.2(2)B1
PPPoA CEF	12.1(1)DC	12.1(4)DC	12.2(2)B1
PPPoE Fast Switching for Multicast	12.1(1)DC	12.1(5)DC	12.2(2)B1
RBE CEF Switching	12.1(5)DC	12.1(5)DC	12.2(2)B1
Service Selection Gateway (NRP-SSG)			
PPP Aggregation Termination over Multiple Domains (PTA-MD)	12.0(3)DC	12.1(4)DC	12.2(2)B1
RADIUS Interim Accounting	12.0(5)DC	12.1(4)DC	12.2(2)B1
SSG AAA Server Group for Proxy RADIUS	12.2(2)B	12.2(2)B	12.2(2)B1
SSG Accounting Update Interval Per Service	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG AutoDomain	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG Auto Logoff	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG Autologon Using Proxy RADIUS	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG Automatic Service Logon	12.0(3)DC	12.1(4)DC	12.2(2)B1
SSG CEF Switching	12.0(5)DC	12.1(4)DC	12.2(2)B1
SSG Default Network	12.0(3)DC	12.1(4)DC	12.2(2)B1
SSG DNS[20] Fault Tolerance	12.0(3)DC	12.1(4)DC	12.2(2)B1
SSG Enable (default is disabled)	12.0(7)DC	12.1(4)DC	12.2(2)B1
SSG Full Username RADIUS Attribute	12.1(3)DC	12.1(4)DC	12.2(2)B1
SSG Hierarchical Policing	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG Host Key	12.2(2)B	12.2(2)B	12.2(2)B1
SSG HTTP[21] Redirect (Phase 1)	12.1(5)DC	12.1(5)DC	12.2(2)B1
SSG Cisco IOS NAT Support	12.0(5)DC	12.1(4)DC	12.2(2)B1
SSG Local Forwarding	12.1(1)DC	12.1(5)DC	12.2(2)B1
SSG Open Garden	12.2(2)B1	12.2(2)B1	12.2(2)B1
SSG Passthrough and Proxy Service	12.0(3)DC	12.1(4)DC	12.2(2)B1
SSG Prepaid Billing	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG Sequential and Concurrent Service	12.0(3)DC	12.1(4)DC	12.2(2)B1
SSG Service Defined Cookie	12.1(3)DC	12.1(4)DC	12.2(2)B1
SSG Single Host Logon	12.1(3)DC	12.1(4)DC	12.2(2)B1

Table 2 Features Supported by the Cisco 6400 NRP in Cisco IOS Release 12.2(2)B7 (continued)

Feature	NRP-1 Supported as of Cisco IOS Release	NRP-2 Supported as of Cisco IOS Release	NRP-2SV Supported as of Cisco IOS Release
SSG Support for MAC Addresses in Accounting Records	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG TCP Redirect for Services (Phase 2)	12.2(4)B3	12.2(4)B3	12.2(4)B3
SSG with GRE	12.0(3)DC	12.1(5)DC	12.2(2)B1
SSG with Multicast	12.0(3)DC	12.1(4)DC	12.2(2)B1
SSG with L2TP Service Type	12.0(7)DC	12.1(4)DC	12.2(2)B1
TCP Redirect—Logon	12.1(5)DC	12.1(5)DC	12.2(2)B1
VPI/VCI Static Binding to a Service Profile	12.0(5)DC	12.1(4)DC	12.2(2)B1
WebSelection	12.0(3)DC	12.1(4)DC	12.2(2)B1
Other Features and Feature Enhancements			
Segmentation and Reassembly Buffer Management Enhancements	12.1(1)DC	—	—
Session Scalability Enhancements	12.1(1)DC	12.1(4)DC	12.2(2)B1

1. VC = virtual circuit.
2. PPP = Point-to-Point Protocol.
3. IPCP = Internet Protocol Control Protocol.
4. ATM = Asynchronous Transfer Mode.
5. SNAP = Subnetwork Access Protocol.
6. DHCP = Dynamic Host Configuration Protocol.
7. IP = Internet Protocol.
8. L2TP = Layer 2 Tunneling Protocol.
9. In Cisco IOS Release 12.1(5)DC, L2TP tunnel switching for the NRP-2 has been tested and is supported at the same session and tunnel levels as the NRP-1. For more information, see Table 4 on page 12.
10. MPLS = Multiprotocol Label Switching.
11. VPN = Virtual Private Network.
12. VLAN = Virtual LAN.
13. ISL = Inter-Switch Link.
14. GE = Gigabit Ethernet.
15. PVC = permanent virtual circuit.
16. PIM = Protocol Independent Multicast.
17. VPI = virtual path identifier.
18. VCI = virtual channel identifier.
19. LAC = L2TP Access Concentrator.
20. DNS = Domain Name System.
21. HTTP = Hypertext Transfer Protocol.

The Cisco IOS software is packaged in software images. Each image contains a specific set of Cisco IOS features. Table 3 lists the features supported by the Cisco 6400 NSP image called c6400s-wp-mz in Cisco IOS Release 12.2(2)B7. The table indicates the release in which each feature was originally introduced. All features supported in previous releases are included in Release 12.2(2)B7.

Note Table 3 might not be cumulative or list all of the features in each image. For a list of the T-train features in this platform, refer to Feature Navigator. For more information about Feature Navigator, see the "Feature Navigator" section on page 25.

Table 3 Features Supported by the Cisco 6400 NSP in Cisco IOS Release 12.2(2)B7

Feature	Supported as of Cisco IOS Release
ATM Connections	
F4 and F5 Operation, Administration, and Maintenance (OAM) Cell Segment and End-to-End Flows	12.0(4)DB
Hierarchical Virtual Private (VP) Tunnels	12.0(4)DB
Logical Multicast Support (up to 254 leaves per output port, per point-to-multipoint virtual circuits)	12.0(4)DB
Multipoint-to-Point User-Network Interface (UNI) Signaling	12.0(4)DB
Point-to-Point and Point-to-Multipoint VCs	12.0(4)DB
Permanent Virtual Circuit (PVC), Soft PVC, Soft Permanent Virtual Path (PVP), and Switched Virtual Circuit (SVC)	12.0(4)DB
Soft Virtual Channel Connections (VCCs) and Virtual Path Connections (VPCs)	12.0(4)DB
VC Merge	12.0(4)DB
VP and VC Switching	12.0(4)DB
VP Multiplexing	12.0(4)DB
VP Tunneling	12.0(4)DB
ATM Internetworking	
LAN Emulation Server (LES) and LAN Emulation Configuration Server (LECS)	12.0(4)DB
RFC 1577 (Classical IP over ATM) ATM Address Resolution Protocol (ARP) Server/Client	12.0(4)DB
ATM Per-Flow Queuing	
Dual Leaky Bucket Policing (ITU-T I.371 and ATM Forum UNI specifications)	12.0(4)DB
Intelligent Early Packet Discard (EPD)	12.0(4)DB
Intelligent Partial (Tail) Packet Discard	12.0(4)DB
Multiple, Weighted (Dynamic) Thresholds for Selective Packet Marking and Discard	12.0(4)DB
Per-VC or per-VP Output Queuing	12.0(4)DB
Strict Priority, Rate, or Weighted Round Robin Scheduling Algorithms	12.0(4)DB
ATM Traffic Classes	
Available Bit Rate (ABR) (EFCI[1] + RR[2]) + Minimum Cell Rate (MCR)	12.0(4)DB
Constant Bit Rate (CBR)	12.0(4)DB
Per-VC or per-VP CBR Traffic Shaping	12.0(4)DB
Shaped CBR VP Tunnels (up to 128)	12.0(4)DB
Substitution of Other Service Categories in Shaped VP Tunnels	12.0(4)DB
Support for Non-Zero MCR on ABR Connections	12.0(4)DB
Unspecified Bit Rate (UBR)	12.0(4)DB

Table 3 Features Supported by the Cisco 6400 NSP in Cisco IOS Release 12.2(2)B7 (continued)

Feature	Supported as of Cisco IOS Release
UBR + MCR	12.0(4)DB
Variable Bit Rate Non-Real Time (VBR-NRT)	12.0(4)DB
VBR Real Time (VBR-RT)	12.0(4)DB
Configuration and Monitoring	
ATM Access Lists on Interim Local Management Interface (ILMI) Registration	12.0(4)DB
ATM Soft Restart	12.0(4)DB
PCMCIA[3] Disk Mirroring	12.1(5)DB
Per-VC or per-VP Nondisruptive Port Snooping	12.0(4)DB
Hardware Support	
1+1 Slot Redundancy (EHSA[4])	12.0(4)DB
Network Management Ethernet (NME)	12.0(5)DB
NRP-2 Support	12.1(4)DB
NSP 1+1 Redundancy	12.0(4)DB
Synchronous Optical Network (SONET) Automatic Protection Switching (APS) Support	12.0(4)DB
Stratum 3/BITS	12.0(7)DB
Telco Alarms	12.0(4)DB
IP and Routing	
Dynamic Host Configuration Protocol (DHCP) Client Support	12.0(4)DB
Internet Protocol (IP)	12.0(4)DB
Network Time Protocol (NTP)	12.0(4)DB
Telnet	12.0(4)DB
Network Management	
ATM Accounting Enhancements	12.0(4)DB
ATM Accounting Management Information Base (MIB)	12.0(4)DB
ATM Remote Monitoring (RMON) MIB	12.0(4)DB
Signaling Diagnostics and MIB	12.0(4)DB
Simple Network Management Protocol (SNMP)	12.0(4)DB
Web Console	12.0(4)DB
QoS	
ATM Policing by Service Category for SVC/Soft PVC	12.2(4)B3
RADIUS/AAA	
Terminal Access Controller Access Control System Plus (TACACS+) (admin login only)	12.0(4)DB
Scalability and Performance	
Capability to View Used/Unused Input Translation Table (ITT) Blocks	12.1(4)DB
Fragmentation Minimization	12.1(4)DB

Table 3 Features Supported by the Cisco 6400 NSP in Cisco IOS Release 12.2(2)B7 (continued)

Feature	Supported as of Cisco IOS Release
ITT Block Shrinking	12.1(4)DB
Signaling and Routing	
ATM Network Service Access Point (NSAP) and Left-Justified E.164 Address Support	12.0(4)DB
Closed User Groups (CUGs) for ATM VPNs	12.0(4)DB
E.164 Address Translation and Autoconversion	12.0(4)DB
Hierarchical Private Network Node Interface (PNNI)	12.0(4)DB
Interim-Interswitch Signaling Protocol (IISP)	12.0(4)DB
ILMI 4.0	12.0(4)DB
VPI/VCI [5] Range Support in ILMI 4.0	12.0(4)DB
UNI 3.0, UNI 3.1, and UNI 4.0	12.0(4)DB

1. EFCI = Explicit Forward Congestion Indication.
2. RR = relative rate.
3. PCMCIA = Personal Computer Memory Card International Association.
4. EHSA = Enhanced High System Availability.
5. VPI/VCI = Virtual Path Identifier/Virtual Channel Identifier.

New and Changed Information

This section describes new features available in Cisco IOS Release 12.2(2)B7 and enhancements to existing features offered in earlier releases.

There are no new hardware or software features supported by the Cisco 6400 aggregator in Cisco IOS Releases:

- 12.2(2)B7
- 12.2(2)B6
- 12.2(2)B5
- 12.2(2)B4
- 12.2(2)B3
- 12.2(2)B2

Limitations and Restrictions

- L2TP Multihop by remote tunnel hostname is not supported in Cisco IOS Release 12.2(2)B7. L2TP Multihop by domain is supported in Cisco IOS Release 12.2(2)B7 by entering the **lcp renegotiation always** command on the L2TP network server (LNS) vpdn-group.

- When you flap an ATM subinterface that has traffic shaping enabled, the NRP-2SV SAR can fail. If this occurs, all sessions will eventually timeout and disconnect. This issue can also occur when you change vc-class parameters. If you use traffic shaping and you need to change configurations related to virtual circuits with traffic shaping configured, you must shutdown the ATM main interface, make your configurations changes, then bring up the ATM main interface.

Important Notes

The following sections contain important notes about Cisco IOS Release 12.2(2)B7 that can apply to the Cisco 6400 aggregator.

Session and Tunnel Scalability

Table 4 shows the number of sessions and tunnels supported for the NRP modules in Cisco IOS Release 12.2(2)B7. While using NRP-SSG, Cisco IOS Release 12.2(2)B7 supports the number of sessions and tunnels shown in Table 5.

Table 4 Session and Tunnel Scalability in Cisco IOS Release 12.2(2)B7

	NRP-1		NRP-2 and NRP-2SV	
Protocol	**Supported Sessions**	**Supported Tunnels**	**Supported Sessions**	**Supported Tunnels**
L2TP PPPoA	1700	300	8000	2000
L2TP PPPoE	2000	300	8000	2000
L2TP Tunnel Switch PPPoA	940	50 Ingress 10 Egress		
L2TP Tunnel Switch PPPoE	940	50 Ingress 10 Egress		
PPPoA	2000	—	8000	—
PPPoE	2000	—	8000	—
PPP Autosense	2000	—	4000	—
RBE	2000	—	8000	—
RFC 1483 IP Routed	2000	—	8000	—
RFC1483 MPLS VPN	—	—	4000	500
RBE MPLS VPN	—	—	4000	500

Table 5 NRP-SSG Session and Tunnel Scalability in Cisco IOS Release 12.2(2)B7

	NRP-1		NRP-2 and NRP-2SV	
Protocol with NRP-SSG	**Supported Sessions**	**Supported Tunnels**	**Supported Sessions**	**Supported Tunnels**
L2TP PPPoA	700	100	4000	2000
L2TP PPPoE	700	100	4000	2000
PPPoA	2000	—	8000	—

Table 5 NRP-SSG Session and Tunnel Scalability in Cisco IOS Release 12.2(2)B7 (continued)

	NRP-1		NRP-2 and NRP-2SV	
Protocol with NRP-SSG	**Supported Sessions**	**Supported Tunnels**	**Supported Sessions**	**Supported Tunnels**
PPPoE	2000	—	8000	—
RBE	2000	—	8000	—
RFC 1483 IP Routed	2000	—	8000	—
GRE PPPoA	—	—	8000	2000

Note To support more than 750 sessions, the NRP-1 must have 128 MB DRAM.

Note In most NRP-2 configurations, 256 MB DRAM is adequate for up to 6500 (PPPoE) sessions. More sessions require 512 MB DRAM.

NRP-2SV Scalability Tuning Parameters

Following are scalability tuning parameter values used during testing for 8000 PPPoA sessions and 2000 L2TP tunnels. These parameters prevent known issue CSCdu86416 from occurring.

```
interface Virtual-Template1
keepalive 200
ppp timeout retry 25
ppp timeout authentication 20

vpdn-group 1
l2tp tunnel hello 150
l2tp tunnel receive-window 500
l2tp tunnel nosession-timeout 20
l2tp tunnel retransmit retries 12
l2tp tunnel retransmit timeout min 4
l2tp tunnel retransmit timeout max 6
```

Following is the hold-queue CLI used during testing.

```
interface ATM0/0/0
 no ip address
 load-interval 30
 atm vc-per-vp 2048
 no atm ilmi-keepalive
 hold-queue 4096 in
 hold-queue 4096 out
end
```

Tip With PPPoA over L2TP network architecture, a few PPP sessions may not have IP addresses allocated during system reboot or interface flapping. If you encounter this problem, configure ppp ncp timeout in the template on LNS as shown here:

```
interface Virtual-Template1
ppp timeout ncp 60
```

It is important to note a potential negative impact on PPPoX termination scenarios:

The default is no time-out at all. Configuring **ppp timeout ncp 60** tells the router if NCP cannot be established within 60 seconds to tear down LCP and start all over again.

Note that you should only configure **ppp timeout ncp 60** if you encounter the IP address allocation problem described here. Do not configure the timeout indiscriminately or to any local termination PPPoA/PPPoE deployment.

Note In most NRP-2 configurations, 256 MB DRAM is adequate for up to 6500 (PPPoE) sessions. More sessions require 512 MB DRAM.

Note The default threshold at which Cisco IOS declares a process to have run “too long” is too short for some Cisco IOS processes, when very large numbers of sessions are established on the NRP-2. Use the command **scheduler max-task-time 20000** to increase the default threshold. This will avoid unnecessary “CPUHOG” messages.

NRP-1 Scalability Tuning Parameters

This section describes the scalability tuning parameters that should be used for running large numbers of sessions on the NRP-1.

```
interface ATM0/0/0
 hold-queue 1000 in
 hold-queue 1000 out
!
interface Virtual-Template1
 keepalive 120
 ppp max-configure 255
 ppp timeout retry 15
 ppp timeout authentication 15
```

DHCP Option 82 Support for Routed Bridge Encapsulation

The DHCP Option 82 Support for RBE feature provides support for the Dynamic Host Configuration Protocol (DHCP) Relay Agent Information Option (Option 82) when using ATM RBE.

Service providers are increasingly using ATM RBE to configure DSL access. The DHCP Option 82 Support for RBE feature enables those service providers to use DHCP to assign IP addresses and DHCP Option 82 to implement IP address assignment policies such as limiting the number of IP addresses on specific ports on specific ports or ATM VCs.

The DHCP Relay Agent Information Option enables a DHCP relay agent to insert information about itself when forwarding client-originated DHCP packets to a DHCP server. The DHCP server can use this information to implement IP address or other parameter-assignment policies.

The DHCP Option 82 Support for RBE feature uses a suboption of the DHCP Relay Agent Information Option called Agent Remote ID. The Agent Remote ID suboption enables the DHCP relay agent to report the ATM RBE subinterface port information to the DHCP server when a DHCP IP address request is processed through the ATM RBE subinterface. The DHCP server can use the ATM RBE subinterface information for making IP address assignments and security policy decisions.

Field Notices and Bulletins

- Field Notices—You can view Cisco 6400 aggregator-specific field notices at http://www.cisco.com/en/US/products/hw/routers/ps314/prod_field_notices_list.html. You can view 12.2B field notices at http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/prod_field_notices_list.html
- Product Bulletins—You can find Cisco 6400 aggregator-specific product bulletins at http://www.cisco.com/en/US/products/hw/routers/ps314/prod_bulletins_list.html. You can view 12.2B product bulletins at http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/prod_field_notices_list.html

Software Caveats

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.

All caveats in Cisco IOS Release 12.2(4)T1 are also in Cisco IOS Release 12.2(2)B7.

For information on caveats in Cisco IOS Release 12.2(4)T1, see *Caveats for Cisco IOS Release 12.2T*, which lists severity 1 and 2 caveats and select severity 3 caveats.

Caveat numbers and brief descriptions are listed in the tables in this section. For details about a particular caveat, go to the Bug Navigator located at http://www.cisco.com/support/bugtools/. To access this location, you must have an account on Cisco.com. For information about how to obtain an account, go to the "Feature Navigator" section on page 25.

Open Caveats—Release 12.2(2)B7

All of the caveats listed in Table 6 are open in Cisco IOS Release 12.2(2)B7 for the Cisco 6400 NRP-1, NRP-2, NRP-2SV, and NSP. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 6 Open Caveats for Cisco 6400 NRP and NSP for Release 12.2(2)B7

Product	Caveat ID Number	Title	Description	Workaround
NRP-2, NRP-2SV, NRP-1, and NSP	CSCdx53637	High CPU utilization for PPPoA sessions recovery when modify shaper	When a traffic shaper value is assigned to a vc-class, or a traffic shaper value is modified, all of the virtual access interfaces belonging to the particular vc-class are reset. It takes approximately 20 minutes to recover 2000 PPPoA sessions.	Perform traffic shaper modifications during maintenance windows in the production network to avoid delay.
NRP-2	CSCdz32636	sub i/f flap causes traceback messages	Traceback messages happen when you flap a sub interface associated with some sessions.	None.

Closed and Resolved Caveats—Release 12.2(2)B7

All of the caveats listed in Table 7 are closed or resolved in Cisco IOS Release 12.2(2)B7 for the Cisco 6400 NRP-1, NRP-2, NRP-2SV, and the NSP. This table lists only severity 1 and 2 caveats and select severity 3 caveats.

Table 7 Closed or Resolved Caveats for Cisco 6400 NRP and NSP for Release 12.2(2)B7

Product	Caveat ID Number	Description
All	CSCdu41289	Error: Bad DFS cluster data passed occurs when deleted from data disk
	CSCdw18198	Parser cache entry may get deleted when in use
	CSCdw47129	Utopia Interface may be in disabled state
	CSCdy27667	Use OAM-Ping to detect/recover the SAR hangup issues
	CSCdy35644	SAR workaround for dx51200 need improve
	CSCdy61412	PPPoE crashes NRP-2 configured with Autosense
	CSCdy74356	NSP crashes while doing snmpwalk on cisco6400chassis MIB
	CSCdy88743	no protocol ip inarp disappears from config after reload
NRP-2, NRP-2SV, NRP-1, and NSP	CSCdx38290	Multiple users configuring vc-class simultaneously causes router to stop responding.
NRP-2, NRP-2SV	CSCdx49484	NRP-2: underflow message while passing traffic through shaped ppp session
	CSCdx56935	Configuring 8 shapers on NRP-2SV makes VCs UNACTIVE,out of rate queue
	CSCdx61271	The atm vc count shows as 0 with 8K sessions & 7 shaper configured
	CSCdx62483	NRP-2:SAR stuck while changing shaping value.
	CSCdx62435	NRP-2: negative VC count, when shut atm int after changing shaper val
	CSCdx81060	8K PPPoA sess/2K L2TP tunnel not coming up w/t traffic shaping enabled
	CSCdx89853	PPPoA/L2TP session takes a long time to appear while changing shaper
	CSCdx92449	With CEF ON, Input atm0/0/0 traffic is not displayed correctly
NRP1	CSCdw12730	NRP stops responding with corrupted PC on parse_token with DT special
NRP-2	CSCdy39288	NRP-2: spurious-memory-access traceback while passing traffic
	CSCdy73108	NRP-2SP (SAR rev D): SAR failure at RX side
	CSCdy74242	Many FIFO resets can cause SAR to hang.
	CSCin21529	NRP-2 crashing and reloading infinitely after wr erase+reload
NRP-2SV	CSCdy18667	NRP-2SV SAR PCI R/W point mismatch
	CSCdy73062	NRP-2: UTOPIA Rx reset check needs improvement
	CSCdz05890	TXRPT_NOBUF messages and console locks-up when shut a0/0/0 sub-I/F
	CSCdz19789	Add CLIs and Reset Default Values for the SAR E with Metal Fixes
	CSCin20239	Shaping accuracy is low
NSP	CSCdv39868	Assertion failed error on console during debugs
	CSCdx91019	OAM end-loopback pings not working properly on NSP
	CSCdx93120	OAM pings failing with ping no match message

Open Caveats—Release 12.2(2)B6

All of the caveats listed in Table 8 are open in Cisco IOS Release 12.2(2)B6 for the Cisco 6400 NRP-2, Cisco 6400 NRP-2SV, Cisco 6400 NRP-1, and the Cisco 6400 NSP.

Table 8 Open Caveats for Cisco 6400 NRP and Cisco 6400 NSP for Release 12.2(2)B6

Product	Caveat ID Number	Description
NRP-2, NRP-2SV	CSCdx49484	NRP-2: underflow message while passing traff through shaped PPP session.
	CSCdx56935	Configuring 8 shapers on NRP-2SV makes VCs UNACTIVE,out of rate queue
	CSCdx61271	The atm vc count shows as 0 with 8K sessions and 7 shaper configured
	CSCdx62435	NRP-2: negative VC count, when shut atm int after changing shaper val
	CSCdx62483	NRP-2:SAR stuck while changing shaping value.
	CSCdx81060	8K PPPoA sess/2K L2TP tunnel not coming up without traffic shaping enabled
	CSCdx89853	PPPoA/L2TP session takes a long time to appear while changing shaper
	CSCdx92449	With CEF ON, Input atm0/0/0 traffic is not displayed correctly
NRP-2, NRP-2SV, NRP-1, and NSP	CSCdx38290	Multiple users configuring VC class simultaneously can cause the router to stop responding
	CSCdx53637	High CPU utilization for PPPoA sessions recovery when shaper is modified
SSG	CSCdx94295	Dynamic MTU check for L2TP feature is not working with Boron

Closed or Resolved Caveats—Release 12.2(2)B6

All the caveats listed in Table 9 are closed or resolved in Cisco IOS Release 12.2(2)B6 for the Cisco 6400 NRP-2, Cisco 6400 NRP-2SV, Cisco 6400 NRP-1, and the Cisco 6400 NSP.

Table 9 Closed or Resolved Caveats for Cisco 6400 NRP and Cisco 6400 NSP for Release 12.2(2)B6

Product	Caveat ID Number	Description
NRP-2, NRP-2SV	CSCdx29110	NRP-2 input queue wedge when receiving OAM traffic
	CSCdx31956	CPU stops responding when performing interface shut/no shut frequently
	CSCdx45918	NRP-2SV with traffic shaping: SAR short fetch issue. SAR stops responding.
	CSCdx49465	CPUHOG at process=pool manager with traffic
	CSCdx51200	NRP-2 PVC stops responding when traffic travels through this shaped VC
	CSCdx54883	I/O memory completely depleted when traffic is sent overnight
	CSCdx62210	NRP-2 stops responding during stressful configuring ATM VCs
	CSCdx62263	Performance degradation with Traffic GE (ATM with shaping on)
	CSCdx68380	NRP-2 ATM transmit queue stops responding
	CSCdx70100	Port CSCdu24077 to NRP2 to suppress cache parity errors
NRP-1	CSCdw73249	SAR not setting up VC when VC line protocol is down

Table 9 Closed or Resolved Caveats for Cisco 6400 NRP and Cisco 6400 NSP for Release 12.2(2)B6 (continued)

Product	Caveat ID Number	Description
NRP-2, NRP-2SV, NRP-1, and NSP	CSCdt60558	Cisco 10000 series Edge Services Router (ESR) scalability: atm_vpivci_to_vc function is not scalable
	CSCdv48261	Improvements to dynamic ACLs for Cisco IOS fw
	CSCdv79009	Access-class on VTY denies all telnet sessions coming into VRF int.
	CSCdw11331	NSP crash with TLB exception and Traceback message
	CSCdw19522	Router restarts due to bus error @ dhcpd_destroy_binding
	CSCdw25402	RPM-PR card crashed when provisioning bulk connections from CWM
	CSCdx63798	NAS port prepend for the acct-sess-id(44) is missing
MIBs	CSCdv02925	Memory leak in CISCO-ATM-SWITCH-CUG-MIB
	CSCdv83902	SNMP timeouts walking ciscoPppoeMIB
	CSCdw13019	Loss of IP/SNMP connectivity to NRP2 when NSP has large run-conf

Open Caveats—Release 12.2(2)B5

No severity 1 or severity 2 open caveats exist for Cisco IOS Release 12.2(2)B5 for the Cisco 6400 NRP-2, Cisco 6400 NRP-2SV, Cisco 6400 NRP-1, and the Cisco 6400 NSP.

Closed or Resolved Caveats—Release 12.2(2)B5

All of the caveats listed in Table 10 are closed or resolved in Cisco IOS Release 12.2(2)B5 for the Cisco 6400 NRP-2, Cisco 6400 NRP-2SV, Cisco 6400 NRP-1, and the Cisco 6400 NSP.

Table 10 Closed or Resolved Caveats for Cisco 6400 NRP and Cisco 6400 NSP for Release 12.2(2)B5

Product	Caveat ID Number	Description
NRP-2 and NRP-2SV	CSCdw60560	Malloc failure for I/O memory during bursty traffic.
NRP-1 and NSP	CSCdw52894	NRP fails while walking the cdslVcClassTable.
	CSCdw68465	NRP-1: memory corruption in vpdn session failure recording.
NRP-2, NRP-2SV, NRP-1, and NSP	CSCdv66216	EE48: ST:RP stopped responding while it attempted to remove 48 VPNs from 48 DS3 interface.
	CSCdv83883	Spurious memory while walking SNMP tree.
	CSCdw80181	Watchdog timer expired.
	CSCdw85034	Memory leak in CISCO-DSL-PROVISION-MIB.

Open Caveats—Release 12.2(2)B4

No severity 1 or severity 2 open caveats exist for Cisco IOS Release 12.2(2)B4 for the Cisco 6400 NRP-2, Cisco 6400 NRP-2SV, Cisco 6400 NRP-1, and the Cisco 6400 NSP.

Closed or Resolved Caveats—Release 12.2(2)B4

All of the caveats listed in Table 11 are closed or resolved in Cisco IOS Release 12.2(2)B4 for the Cisco 6400 NRP-2, Cisco 6400 NRP-2SV, Cisco 6400 NRP-1, and the Cisco 6400 NSP.

Table 11 Closed or Resolved Caveats for Cisco 6400 NRP and Cisco 6400 NSP for Release 12.2(2)B4

Product	Caveat ID Number	Description
NRP-2 and NRP-2SV	CSCdw60122	OAM CRC10 Errored packets can cause an input queue wedge on ATM0/0/0.
	CSCdw83085	Enhance ATM driver debugging.
NRP-1 and NSP	CSCdv74851	NRP1 with IRB fails with bus error.
	CSCdw05710	Cisco 6400 aggregator: PVC becomes inactive, %ATMCES-1-ERRCREATEVC.
	CSCdw81924	Port CSCdm89718 to NRP1 (code currently only on Cisco 7200 series router and rsp).
NRP-2, NRP-2SV, NRP-1, and NSP	CSCdw42849	PPPoE session does not clear.
	CSCdw65903	An error can occur with management protocol processing.

Open Caveats—Release 12.2(2)B3

All of the caveats listed in Table 12 are open in Cisco IOS Release 12.2(2)B3 for the Cisco 6400 NRP-2 and NRP-2SV.

Table 12 Open Caveats for Cisco 6400 NRP-2 and NRP-2SV for Release 12.2(2)B3

Product	Caveat ID Number	Description
NRP-2 and NRP-2SV	CSCdw13019	Loss of IP/SNMP connectivity to NRP-2 when NSP has large run-conf.
	CSCdw26218	Virtual access gets stuck in LCP closed state.
	CSCdw30583	Loss of IP connectivity between NSP and NRP-2 with large config files.
	CSCdw32965	NRP-2 stops responding when traffic switches over from another NRP-2.
	CSCdw37740	Heavy loading prevents NSP from pinging ATM OAM to NRP-2.

Closed or Resolved Caveats—Release 12.2(2)B3

All of the caveats listed in Table 13 are closed or resolved in Cisco IOS Release 12.2(2)B3 for the Cisco 6400 NRP-2 and NRP-2SV.

Table 13 Closed or Resolved Caveats for Cisco 6400 NRP-2 and NRP-2SV for Release 12.2(2)B3

Product	Caveat ID Number	Description
NRP-2 and NRP-2SV	CSCdu29467	ipfast_frag.c: Contains a possible dereference null pointer.
	CSCdw11239	PE of MPLS-VPN stops forwarding packets after stress with large packet sizes.
	CSCdw37282	Traffic does not pass when reset occurs with traffic shaping enabled.

Open Caveats—Release 12.2(2)B2

All of the caveats listed in Table 14 are open in Cisco IOS Release 12.2(2)B2 for the Cisco 6400 NRP-1, NRP-2, and NRP-2SV. All of the caveats listed in Table 15 are open in Cisco IOS Release 12.2(2)B2 for the Cisco 6400 NSP. These tables list only severity 1 and 2 caveats and select severity 3 caveats. Table 16 lists caveats that pertain to MIB files for the Cisco 6400 aggregator for Release 12.2(2)B2.

Table 14 Open Caveats for Cisco 6400 NRP for Release 12.2(2)B2

Product	Caveat ID Number	Description
NRP-2	CSCdr95295	NRP-2: Total memory size displayed is incorrect.
	CSCdt57785	NRP-2: You cannot view startup config context if config is set to 0x**4*.
	CSCdu58024	NRP-2: GE<->GE back to back with no autonegotiation and user is unable to recover link.
	CSCdu58091	A copy of files from NRP-2 to NSP causes an NSP Bus Error exception.
	CSCdu66436	False counter throughput statistics.
	CSCdv32871	NRP-2: Cut and paste a range pvc config produces a traceback message.
	CSCdv39868	Assertion failed error on console during debugs.
	CSCdv55745	If you try to change encap type, the error message Null RX particle header appears.
	CSCdv55811	NRP-2 stops responding at se64_close_rx_vc_desc if you try to change vc encap.
	CSCdv56280	GE: Auto-nego CLI command is missing.
	CSCdv70703	NRP-2: After removing the multicast boundary mroute table not updated.
	CSCdv75114	NRP-2: ISIS routing updates not sent with AAL5NLPID, SNAP, MUX in GE-ATM.
	CSCdv77023	NRP-2: Multicast client does not respond to ICMP packet with CEF ON.
	CSCdw07107	When NSP has large run-conf, there is a loss of IP/SNMP connectivity to NRP-2.
NRP-1	CSCdp05523	NAT: Large address range and portlist chains cause CPU spikes.
	CSCdp59354	Egress traffic to RBE ints process sw with FE+ISL and <<bridge irb>>.
	CSCdr04534	PPPoA/L2TP: 2000 sessions. Some connected routes are not established after flap.
	CSCdr50376	Some sessions drop when the VCs are oversubscribed.
	CSCdr82324	L2TP: VPDN: Releases idb for LAC/LNS tunnel.
	CSCdt74755	NAT cause high CPU utilization.
	CSCdu01557	NRP fails with BADFREEMAGIC message.
	CSCdu09764	c6400: NRP crash with bad magic on allocated block.
	CSCdu56256	Fast Ethernet interface reports %AMDP2_FE-3-UNDERFLO, transmit error.
	CSCdu64354	Option 82 and RADIUS VPI/VCI authentication does not work with S-PVC.
	CSCdv19996	FE interface on some NRP-1 boards drops packets.
	CSCdv63811	Memory corruption in I/O pool.
	CSCdv74851	NRP-1 with IRB fails with bus error.
	CSCdv75177	NRP-1-PPPoA—Poor traffic performances caused by ATM0/0/0 drops.
	CSCdv82697	NRP-1: IRB Routing protocol updates not working with ISIS.
SSG	CSCdv05136	SSG Service Profile Name should be legally formatted.

Table 15 Open Caveats for Cisco 6400 NSP for Release 12.2(2)B2

Product	Caveat ID Number	Description
NSP	CSCdr71571	Disk access error after NRP2 fails with config file open.
	CSCdt33730	Port scans caused ALIGN-3-READEXCEPTION on NSP.
	CSCdt39132	Unable to synchronize files and directories if the path+filename is more than 53 characters.
	CSCdt41423	Secondary stops responding when transitioning to primary on failover.
	CSCdu23253	ATM i/f with NRP is not properly displaying alarm state.
	CSCdv35547	%SCHED-3-THRASHING error with traceback on NSP.

Table 16 Open Caveats for Cisco 6400 MIBs for Release 12.2(2)B2

Caveat ID Number	Description
CSCdv82930	Threshold value for cPppoeVcSessionThresholdTrap not defaulting.
CSCdv83898	atmIntfCurrentlyOAMFailingPVcls.1 causing SNMP-3-CPUHOG.
CSCdv83902	SNMP timeouts walking ciscoPppoeMIB.
CSCdv86358	System reset when activate CISCO-FTP-CLINET-MIB cfcRequestTable row.

Closed and Resolved Caveats—Release 12.2(2)B2

All of the caveats listed in Table 17 are closed or resolved in Cisco IOS Release 12.2(2)B2 for the Cisco 6400 NRP-1 and NRP-2. All of the caveats listed in Table 18 are closed or resolved in Cisco IOS Release 12.2(2)B2 for the Cisco 6400 NSP. These tables list only severity 1 and 2 caveats and select severity 3 caveats.

Table 17 Closed or Resolved Caveats for Cisco 6400 NRP for Release 12.2(2)B2

Product	Caveat ID Number	Description
NRP-2 and NRP-1	CSCdt84904	DHCP offer forwarded out all MPLS VPN cable subinterfaces.
	CSCdw00126	Input queue wedged on BV1.

Table 17 Closed or Resolved Caveats for Cisco 6400 NRP for Release 12.2(2)B2 (continued)

Product	Caveat ID Number	Description
NRP-2	CSCdm92848	EHSA minor alarm appears after two non-redundancy NRP bootups.
	CSCdr88742	wr mem on NRP2 does not generate a warning or error message if no disk0.
	CSCdr98773	Creating subinterfaces and PVCs does not appear in the configuration file.
	CSCds26319	VA interfaces counters show three times the actual counts if the client is NRP2.
	CSCds47327	NRP2_SE64-3-ULD_BADVC message if you issue the **shut atm sub-interface** commands.
	CSCds79849	CPUHOG while clearing counters with large numbers of PPP sessions.
	CSCds83542	Spurious Memory access during PPPOA/L2TP sessions.
	CSCds83689	NRP2: Some sessions may not come up after interface flap in L2TP.
	CSCdt15119	NRP2: ISIS routing updates are not sent with AAL5NLPID,SNAP,MUX encap.
	CSCdt19637	CPU hog when clear counters are being processed.
	CSCdt37234	ATM0/0/0 stops passing traffic on the NRP2 in Cisco IOS Release 12.1(4.4)DC1.
	CSCdt51547	Packet drop with ip verify unicast reverse-path.
	CSCdt51810	Crash at nrp_ip2_tag_feature in Cisco IOS Release 12.1(5)DC throttle.
	CSCdt65960	Access-list not working on VTY when you telnet GigEth port.
NRP-1	CSCdv47420	NRP1 Ethernet interface does not receive a dynamic IP address.
	CSCdv51304	Option 82 is not removed from unnumbered DHCP responses.
	CSCdv57549	NRP1 FE interface enters reset state.
SSG	CSCdt73695	SSG HTTP Redirection feature does not work for RBE user.
	CSCdt76953	Memory leaks occur in Net Background processes when you log on to ssg l2tp.

Table 18 Closed or Resolved Caveats for Cisco 6400 NSP for Release 12.2(2)B2

Product	Caveat ID Number	Description
NSP	CSCdr65451	ILMI does not come up on DS3 interface.
	CSCdr88742	wr mem on NRP2 does not generate a warning or error message when no disk0.
	CSCds51415	PAM mailbox configuration not valid on NRP1 while booting.
	CSCdt29127	ILMI failure on atm0/0/0 after NSP switchover.
	CSCdt45629	Problem with VC resource allocation.
	CSCdt46373	Rwait is not cleaned up. Problem with VC management.
	CSCdt47730	OSPF and XtagATM interface issues on NRP when NSP reloads.
	CSCdt65698	NSP switchover causes NRP2 in certain slots to reset.
	CSCdt71049	APS unidirectional switches bidirectionally.
	CSCdt71080	APS forced switch to non-operational protect should not be allowed.
	CSCdt76617	PVCs on NSP subinterface stops passing traffic after reload.

Related Documentation

The following sections describe the documentation available for the Cisco 6400 aggregator. Documentation is available on Cisco.com and on the Documentation CD-ROM.

Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.2T and are located on Cisco.com and the Documentation CD-ROM:

- *Cross-Platform Release Notes*

  On Cisco.com at:

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

- Product bulletins, field notices, and other release-specific documents on Cisco.com at:

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

- *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2T*

  As a supplement to the caveats listed in the "Software Caveats" section in these release notes, see *Caveats for Cisco IOS Release 12.2* and *Caveats for Cisco IOS Release 12.2T*, which contain caveats applicable to all platforms for all maintenance releases of Release 12.2.

  On Cisco.com:

  Caveats for Cisco IOS Release 12.2T
  http://www.cisco.com/en/US/products/sw/iosswrel/ps1839/prod_release_note09186a00800a84d7.html

  Caveats for Cisco IOS Release 12.2
  http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/prod_release_note09186a00800ab6bb.html

Platform-Specific Documents

The documents listed in this section are available for the Cisco 6400 aggregator on Cisco.com and the Documentation CD-ROM. To access Cisco 6400 aggregator documentation on Cisco.com, go to http://www.cisco.com/en/US/products/hw/routers/ps314/index.html

- *Cisco 6400 Software Setup Guide*
- *Cisco 6400 Command Reference*
- *Cisco 6400 Feature Guide*
- *Cisco 6400 Hardware Installation and Maintenance Guide*
- *Cisco 6400 Installation and Replacement of Field-Replaceable Units*
- *Regulatory Compliance and Safety Information for the Cisco 6400*
- *Cisco 6400 Site Planning Guide*

Feature Navigator

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image.

Feature Navigator is available 24 hours a day, 7 days a week. To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at cdbadmin@cisco.com. If you do not have an account on Cisco.com, go to http://www.cisco.com/register and follow the directions to establish an account.

To use Feature Navigator, you must have a JavaScript-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has JavaScript enabled. To enable JavaScript for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For JavaScript support and enabling instructions for other browsers, check with the browser vendor.

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. It contains feature information about mainline-, T-, S-, and P-trains. You can access Feature Navigator at the following URL:

http://www.cisco.com/go/fn

Cisco IOS Release 12.2 Documentation Set

Table 19 lists the contents of the Cisco IOS Release 12.2 software documentation set, which is available in both electronic and printed form. This documentation is available on Cisco.com at http://www.cisco.com/en/US/products/sw/iosswrel/ps1835/index.html

Table 19 Cisco IOS Release 12.2 Documentation Set

Books	Major Topics
• *Cisco IOS Configuration Fundamentals Configuration Guide* • *Cisco IOS Configuration Fundamentals Command Reference*	Cisco IOS User Interfaces File Management System Management
• *Cisco IOS Bridging and IBM Networking Configuration Guide* • *Cisco IOS Bridging and IBM Networking Command Reference, Volume 1 of 2* • *Cisco IOS Bridging and IBM Networking Command Reference, Volume 2 of 2*	Transparent Bridging SRB Token Ring Inter-Switch Link Token Ring Route Switch Module RSRB DLSw+ Serial Tunnel and Block Serial Tunnel LLC2 and SDLC IBM Network Media Translation SNA Frame Relay Access NCIA Client/Server Airline Product Set DSPU and SNA Service Point SNA Switching Services Cisco Transaction Connection Cisco Mainframe Channel Connection CLAW and TCP/IP Offload CSNA, CMPC, and CMPC+ TN3270 Server

Table 19 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• *Cisco IOS Dial Technologies Configuration Guide* • *Cisco IOS Dial Technologies Command Reference*	Preparing for Dial Access Modem and Dial Shelf Configuration and Management ISDN Configuration Signaling Configuration Dial-on-Demand Routing Configuration Dial Backup Configuration Dial Related Addressing Service Virtual Templates, Profiles, and Networks PPP Configuration Callback and Bandwidth Allocation Configuration Dial Access Specialized Features Dial Access Scenarios
• *Cisco IOS Interface Configuration Guide* • *Cisco IOS Interface Command Reference*	LAN Interfaces Serial Interfaces Logical Interfaces
• *Cisco IOS IP Configuration Guide* • *Cisco IOS IP Command Reference, Volume 1 of 3: Addressing and Services* • *Cisco IOS IP Command Reference, Volume 2 of 3: Routing Protocols* • *Cisco IOS IP Command Reference, Volume 3 of 3: Multicast*	IP Addressing and Services IP Routing Protocols IP Multicast
• *Cisco IOS AppleTalk and Novell IPX Configuration Guide* • *Cisco IOS AppleTalk and Novell IPX Command Reference*	AppleTalk Novell IPX
• *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide* • *Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference*	Apollo Domain Banyan VINES DECnet ISO CLNS XNS
• *Cisco IOS Voice, Video, and Fax Configuration Guide* • *Cisco IOS Voice, Video, and Fax Command Reference*	Voice over IP Call Control Signaling Voice over Frame Relay Voice over ATM Telephony Applications Trunk Management Fax, Video, and Modem Support
• *Cisco IOS Quality of Service Solutions Configuration Guide* • *Cisco IOS Quality of Service Solutions Command Reference*	Packet Classification Congestion Management Congestion Avoidance Policing and Shaping Signaling Link Efficiency Mechanisms

Table 19 Cisco IOS Release 12.2 Documentation Set (continued)

Books	Major Topics
• *Cisco IOS Security Configuration Guide* • *Cisco IOS Security Command Reference*	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options Supported AV Pairs
• *Cisco IOS Switching Services Configuration Guide* • *Cisco IOS Switching Services Command Reference*	Cisco IOS Switching Paths NetFlow Switching Multiprotocol Label Switching Multilayer Switching Multicast Distributed Switching Virtual LANs LAN Emulation
• *Cisco IOS Wide-Area Networking Configuration Guide* • *Cisco IOS Wide-Area Networking Command Reference*	ATM Broadband Access Frame Relay SMDS X.25 and LAPB
• *Cisco IOS Mobile Wireless Configuration Guide* • *Cisco IOS Mobile Wireless Command Reference*	General Packet Radio Service
• *Cisco IOS Terminal Services Configuration Guide* • *Cisco IOS Terminal Services Command Reference*	ARA LAT NASI Telnet TN3270 XRemote X.28 PAD Protocol Translation
• *Cisco IOS Configuration Guide Master Index* • *Cisco IOS Command Reference Master Index* • *Cisco IOS Debug Command Reference* • *Cisco IOS Software System Error Messages* • *New Features in 12.2T-Based Limited Lifetime Releases* • *New Features in Release 12.2T* • *Release Notes* (release note and caveat documentation for 12.2T-based releases and various platforms)	

Obtaining Documentation

These sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at this URL:

http://www.cisco.com

Translated documentation is available at this URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/cgi-bin/order/order_root.pl

- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

  http://www.cisco.com/go/subscription

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

You can submit comments electronically on Cisco.com. In the Cisco Documentation home page, click the **Fax** or **Email** option in the "Leave Feedback" section at the bottom of the page.

You can e-mail your comments to bug-doc@cisco.com.

You can submit your comments by mail by using the response card behind the front cover of your document or by writing to the following address:

Cisco Systems
Attn: Document Resource Connection
170 West Tasman Drive
San Jose, CA 95134-9883

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

If you want to obtain customized information and service, you can self-register on Cisco.com. To access Cisco.com, go to this URL:

http://www.cisco.com

Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Cisco TAC inquiries are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

The Cisco TAC resource that you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

You can use the Cisco TAC Web Site to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to this URL:

http://www.cisco.com/tac

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

http://www.cisco.com/register/

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC Web Site, you can open a case online by using the TAC Case Open tool at this URL:

http://www.cisco.com/tac/caseopen

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

Before calling, check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, have available your service agreement number and your product serial number available.

This document is to be used in conjunction with the documents listed in the "Related Documentation" section on page 24.