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Release Notes for Cisco 6400 NRP for Cisco IOS Release 12.0(7)DC

February 16, 2002

These release notes for the node route processor (NRP) of the Cisco 6400 UAC support Cisco IOS Release 12.0DC, up to and including Cisco IOS Release 12.0(7)DC1. These release notes are updated as needed to describe new features, memory requirements, hardware support, software platform deferrals, and changes to the microcode or modem code and related documents.

For a list of the software caveats that apply to Cisco IOS Release 12.0(7)DC1, see the “Software Caveats” section on page 10 and *Caveats for Cisco IOS Release 12.0 T*. The caveats document is updated for every maintenance release and is located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

Use these release notes in conjunction with the cross-platform *Release Notes for Cisco IOS Release 12.0* located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

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System Requirements

This section describes the system requirements for the Cisco 6400 UAC NRP and includes the following sections:

- Memory Requirements, page 2
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Memory Requirements

Table 1 describes the memory requirements for the Cisco 6400 NRP.

Table 1 Cisco 6400 NRP Memory Requirements

Product Name	Image Names	Minimum Required Flash SIMM	Required Main Memory	Runs from
NRP - BASE, LSC, OR MPLS VPN	c6400r-g4p5-mz c6400r-boot-mz	8 MB Flash	64 MB DRAM	RAM
NRP - MD	c6400r-g4p5-mz c6400r-boot-mz	8 MB Flash	64 MB DRAM	RAM
NRP - WEB SELECTION	c6400r-g4p5-mz c6400r-boot-mz	8 MB Flash	64 MB DRAM	RAM

Note Depending on the configuration, you need 128 MB DRAM to support more than 750 subscribers.

Hardware Supported

Cisco IOS Release 12.0(7)DC1 supports the Cisco 6400 NRP. For detailed descriptions of the new hardware features, see the “New and Changed Information” section on page 5.

Software Compatibility

Cisco IOS Release 12.0(7)DC1 works with the Cisco Service Selection Dashboard, version 2.2.

Cisco recommends that you use Cisco IOS Release 12.0(7)DC1 for the NRP concurrently with Cisco IOS Release 12.0(7)DB for the Cisco 6400 node switch processor (NSP). For information about Cisco IOS Release 12.0(7)DB for the NSP, see the *Release Notes for Cisco 6400 Node Switch Processor (NSP) for Cisco IOS Release 12.0(7)DB*.

Determining Your Software Release

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

```
router> show version
```

An output appears similar to the following. The Cisco IOS version appears in the second line.

```
Cisco Internetwork Operating System Software
IOS (tm) 6400 Software (c6400r-g4p5-mz), Version 12.0(7)DC1.....
```

The output includes additional information including processor revision numbers, memory amounts, hardware IDs, and partition information. To upgrade to a new software release, see the “Cisco Connection Online” section.

Upgrading to a New Software Release

For information about upgrading software on the Cisco 6400 Universal Access Concentrator (UAC), including upgrading a single- or dual-NRP system to a new software release, see the software note *Upgrading Software on the 6400 UAC* located at:

http://www.cisco.com/univercd/cc/td/doc/product/dsl_prod/6400/softnote/upgradsw.htm

For general information about upgrading to a new software release, see the product bulletin *Cisco IOS Upgrade Ordering Instructions* located at:

http://www.cisco.com/warp/public/cc/pd/iosw/prodlit/957_pp.htm

If you do not have an account on CCO and want general information about upgrading to a new software release, see the product bulletin *Cisco IOS Software Release 11.3 Upgrade Paths and Packaging Simplification (#703: 12/97)* on CCO at:

Technical Documents: Product Bulletins: Software: Cisco IOS 11.3: Cisco IOS Software Release 11.3 Upgrade Paths No. 703

This product bulletin does not contain information specific to Cisco IOS Release 12.0 but provides generic upgrade information that may apply to Cisco IOS Release 12.0.

Feature Table

The Cisco IOS software is packaged in software images that each contain a specific set of Cisco IOS features. Table 2 lists the features supported by the Cisco 6400 NRP image called c6400r-g4p5-mz.

Note Table 2 contains only a selected list of features. The table is not a cumulative or complete list of all the features in this image.

Table 2 Feature List for the Cisco 6400 NRP

Layer 2 and Layer 3 Protocols

ARP

IPCP

IP forwarding

Table 2 Feature List for the Cisco 6400 NRP (continued)

IP host
IP multicast
IRB
L2TP
MPLS
PPP over ATM
PPP over Ethernet
RBE
Routed RFC1483 encapsulation
TCP
Telnet
TFTP
UDP
Transparent bridging
VLAN
Layer 3 Routing Protocols
BGP4
EIGRP
IS-IS
OSPF
PIM
RIP
WCCP Version 2
Network Management, Security
AAA
CHAP
FTP
NAT
PAP
RADIUS
SNMP
TACACS+
LAN Interfaces
ATM (OC-3, OC-12, DS3)
Ethernet (10BaseT)
Fast Ethernet (100BaseTX)
Other
NRP-SSG
CEF Switching

New and Changed Information

The following sections list the new features supported by the NRP in Cisco IOS Release 12.0(7)DC1 and Cisco IOS Release 12.0(7)DC.

New Hardware and Software Features in Release 12.0(7)DC1

No new hardware or software features are supported in Cisco IOS Release 12.0(7)DC1.

New Software Features in Release 12.0(7)DC

Border Gateway Protocol

The Cisco 6400 supports BGP4, the current version of Border Gateway Protocol (BGP). For more information on Border Gateway Protocol, see the "Border Gateway Protocol (BGP)" chapter in the *Internetworking Technology Overview*.

Layer 2 Tunnel Protocol Scalability Enhancements

By improving L2TP control connection processing and virtual template cloning, these scalability enhancements provide resilience to dropouts between the L2TP access concentrator (LAC) and L2TP network server (LNS) while supporting the following combinations of PPP sessions and L2TP tunnels:

PPP Type	Number of Supported PPP Sessions	Corresponding Number of Supported L2TP Tunnels
PPPoE	up to 2000	up to 300
PPPoA	up to 1700	up to 300
Combined PPPoE and PPPoA	up to 1700	up to 100

For more information on these enhancements, see the *Layer 2 Tunnel Protocol Scalability Enhancements* feature module.

Note Layer 2 forwarding (L2F) is not supported in Release 12.0(7)DC and Release 12.0(7)DC1 for the Cisco 6400 NRP.

Multiprotocol Label Switching

The Cisco 6400 NRP can participate in a Multiprotocol Label Switching (MPLS) network as an MPLS label switch controller (LSC) for the Cisco BPX 8650. For more information, see the *MPLS Label Switch Controller Enhancements* feature module.

The NRP can also participate in an MPLS network as a label switch router (LSR) or as an Edge LSR, as well support MPLS virtual private networks (VPNs). For more information on MPLS on the 6400, see the *Configuring Multiprotocol Label Switching on the Cisco 6400 UAC* configuration note.

Node Route Processor-Service Selection Gateway Enhancements II

The Node Route Processor-Service Selection Gateway (NRP-SSG) feature is now disabled by default. To use NRP-SSG in this release, enter the **ssg enable** global configuration command.

NRP-SSG now also supports L2TP. When a subscriber selects a service via the Service Selection Dashboard (SSD), the NRP as an L2TP Access Concentrator (LAC) will send the PPP session through the service specific L2TP tunnel. If the tunnel does not already exist, the NRP-LAC creates the proper tunnel to the L2TP Network Server (LNS).

For more information on these NRP-SSG enhancements, see the *Node Route Processor—Service Selection Gateway Enhancements II* feature module.

RADIUS VC Logging Enhancement

This feature enhancement provides a new **show** command to display the VPI/VCI information that can be used by the RADIUS VC Logging feature. For more information, see the *RADIUS VC Logging Enhancement* feature module.

Web Cache Communication Protocol Version 2

The Cisco 6400 NRP supports Web Cache Communication Protocol (WCCP) Version 2. The WCCP feature allows you to use a Cache Engine to handle web traffic, reducing transmission costs and downloading time. For more information on WCCP Version 2, see Appendix C, "Web Cache Communication Protocol Version 2", in the *Cisco Cache Engine User Guide, Version 2.0.0*.

New Software Features in Release 12.0(5)DC

Layer 2 Tunnel Protocol

The Cisco 6400 NRP supports the use of layer 2 tunnel protocol (L2TP), an extension to the PPP protocol used for virtual private networks (VPNs). Release 12.0(5)DC supports L2TP with up to 400 sessions and up to 25 tunnels. For more information about L2TP, see the *Layer 2 Tunnel Protocol* feature module.

Note Layer 2 forwarding (L2F) is not supported in Release 12.0(5)DC for the Cisco 6400 NRP.

Combined Network Management Ethernet Interface

The combined network management Ethernet (NME) interface allows the entire Cisco 6400 system, including the NSP and all installed NRPs, to be managed through a single Ethernet interface. The NME interface eliminates the need for Ethernet cables and connections on individual NRPs.

Use of the combined NME interface requires Cisco IOS Release 12.0(5)DB for the NSP. See "Software Compatibility" section on page 2 for more information.

For more information about using the combined NME interface, see "Configuring the NSP" and "Configuring the NRP" in the *Cisco 6400 UAC Software Configuration Guide*.

RADIUS VC Logging

RADIUS Virtual Circuit (VC) Logging allows the Cisco 6400 Universal Access Concentrator to accurately record the virtual path interface (VPI) and virtual circuit interface (VCI) of an incoming subscriber session. With RADIUS VC Logging enabled, the RADIUS network access server (NAS) port field is extended and modified to carry VPI/VCI information. This information is logged in the RADIUS accounting record created at session startup. For more information about RADIUS VC logging, see the *RADIUS VC Logging* feature module.

IPCP Subnet Mask Support

IP Control Protocol (IPCP) subnet mask support allows customer premise equipment (CPE) to connect to the Cisco 6400 NRP and obtain an IP address and subnet mask range which it can use to populate its DHCP server database. To enable IPCP subnet mask support, you must specify a value for the **Framed-IP-Netmask** attribute (IETF RADIUS attribute 9) in the RADIUS user profile.

Using IPCP, the Cisco 6400 brings up PPP sessions with the CPE and authenticates each CPE as a separate user. The Cisco 6400 adds a static route for the IP address with the mask specified. If the netmask is specified in the user profile, the Cisco 6400 passes the IP netmask value and the IP address to the CPE during IPCP negotiation. The CPE uses the netmask to calculate an IP address pool from which IP addresses are assigned to PCs using the access link.

ATM Routed Bridge Encaps

The ATM routed bridge encaps feature on the Cisco 6400 NRP is used to route IP over bridged RFC 1483 Ethernet traffic from a stub bridged LAN. Bridged IP packets received on an ATM interface configured in route-bridged mode are routed via the IP header. Such interfaces take advantage of the characteristics of a stub LAN topology and offer increased performance and flexibility over integrated routing and bridging (IRB). For more information about ATM routed bridge encaps, see the *ATM Routed Bridge Encaps* feature module.

Service Selection Gateway Features

Enhancements to the Cisco 6400 NRP Service Selection Gateway (SSG) include IOS network address translation (NAT), support for Cisco Express Forwarding (CEF), VPI/VCI indexing to service profile, and RADIUS interim accounting record generation. For more information about SSG enhancements, see the *Node Route Processor-Service Selection Gateway Enhancements* feature module.

New Software Features in Release 12.0(3)DC

Point-to-Point Protocol over Ethernet

The Cisco 6400 NRP now supports Point-to-Point Protocol over Ethernet (PPPoE), which allows you to configure PPP over Ethernet on ATM using a virtual circuit (VC) multiplexed encapsulation mode. Using a PPPoE client, a PPP session can be initiated on a simple bridged Ethernet connected client through a standard Digital Subscriber Line (DSL) modem. The session is transported over the ATM DSL link via RFC 1483 Ethernet bridged frames and terminated in the Cisco 6400 NRP. The Cisco 6400 NRP does not support PPPoE on the Fast Ethernet port.

For more information about PPPoE, see the *PPP over Ethernet* feature module.

Node Route Processor—Service Selection Gateway

The Node Route Processor-Service Selection Gateway (NRP-SSG) is a switching solution for service providers who offer intranet, extranet and Internet connections to subscribers using high-speed data circuit equipment (DCE) such as Asymmetric Digital Subscriber Line (ADSL) equipment to allow simultaneous access to network services. The NRP-SSG allows the Cisco 6400 to act as a central control point for Layer 2 and Layer 3 services. This can include services available through ATM VCs, virtual private dial-up networks (VPDNs) or normal routing methods. The NRP-SSG feature is designed to work with the Cisco Service Selection Dashboard version 2.1 for Layer 3 services available on CCO.

For more information about the Service Selection Gateway, see the *Node Route Processor—Service Selection Gateway* feature module

Pre-Existing NRP Hardware Caveats

This section describes possible unexpected behavior by earlier hardware versions of the NRP.

- CSCdk47837—NRPs reset when you reload or reset a non-redundant NSP in Slot 0A.

Affected Part Number: 800-03785-03

Symptom:

While the NSP is in Slot 0A of a single NSP system, the NRPs reset during NSP reloads or resets.

Workaround:

In a non-redundant system using an NSP of P/N 800-03785-03, place the NSP in Slot 0B.

- CSCdk88262—NRP ignores **boot system** command entries in the startup configuration.

Affected Part Numbers:

800-03655-01, 800-03655-02, 800-03655-03, 800-03655-04

Symptoms:

Regardless of any **boot system** global configuration command entries in the startup configuration, the NRP boots the first image in flash after a reset. This problem occurs after one of the following actions:

- NRP power cycle
- Two or more successive resets by using the **hw-module EXEC** command on the NSP.

Workaround:

To avoid this problem, make sure that the desired image is the first file on the flash device. Complete the following steps in EXEC mode:

- 1 Enter **delete flash:*** to mark all files on the flash device for deletion.
- 2 Enter **squeeze flash:** to permanently erase all files marked for deletion.
- 3 Use the **copy flash:** EXEC command to copy the desired image to the flash device.
- 4 Use the **dir flash:** EXEC command to verify that the image file is the first file on the flash device.

Recovery:

If you encounter the problem before implementing the workaround, reset the NRP once by using the **hw-module slot number reset** EXEC command on the NSP. As long as the NSP sends a single reset to the NRP, the NRP does not ignore the **boot system** global configuration command entries in the startup configuration.

- CSCdp57387—Hot-inserting an NRP might reset the adjacent NRP.

Affected Part Numbers:

800-03655-04, 800-03655-05, 800-03655-06

Symptoms:

With or without redundancy configured, an NRP inserted into a live system might reset the NRP in the adjacent slot of the slot pair. NRP slot pairs are slots 1-2, 3-4, 5-6, and 7-8.

Workaround (use one of the following):

- If you are not using NRP redundancy and your system contains four or less NRPs, place only one NRP in each slot pair.
- If this workaround is not feasible, replace your NRP(s) with P/N 800-03655-07 or higher.

- CSCdr08888—NRP Console port doesn't respond

Affected Part Number: 800-03655-01

Symptoms:

When the terminal server is configured such that hardware flow control is enabled on the port attached to the NRP console, the NRP console port does not respond.

Workaround:

Configure your terminal server to disable hardware flow control on the port attached to the NRP console.

Determining Your NRP Part Number

To determine the NRP part number, use one of the following methods along with Table 3:

- If you are holding the board, look at the 800- part number label on the back of the NRP.
- If you can only view the faceplate of the NRP, look at the CLEI code label.
- Enter the **show nrp** privileged EXEC command to display the 73- part number.

The following example displays the **show nrp** command output for an NRP with part number 73-3082-06:

```

6400-nrp# show nrp
Router installed in slot 5
Network IO Interrupt Throttling:
throttle count=0, timer count=0
active=0, configured=0
netint usec=4000, netint mask usec=200
NRP CPU ID EEPROM:
Hardware revision 4.255 Board revision A0
Serial number 12346818 Part number 73-3082-06
Test history 0x0 RMA number 00-00-00
EEPROM format version 2
EEPROM contents (hex):
0x00: 02 E3 04 FF 00 BC 65 C2 49 0E 26 05 00 00 00 00
0x10: 50 00 00 00 07 CF 04 09 00 00 00 78 00 00 00 00
6400-nrp#

```

Table 3 NRP Part Numbers

CLEI Code	800- Part Number	73- Part Number
BAC5EEPDAA	800-03655-01	73-3082-03
BAC5EEPDAB	800-03655-02	73-3082-04
BAC5EEPDAC	800-03655-03	73-3082-05
BAC5EEPDAD	800-03655-04	73-3082-06
BAC5EEPDAE	800-03655-05	73-3082-07
BAC5EEPDAF	800-03655-06	73-3082-08
BAC7RUBCAA	800-03655-07	73-3082-09

Software Caveats

This section contains open caveats for the current Cisco 6400 NRP release only. Caveats in Cisco IOS Release 12.0 also apply to Release 12.0(7)DC1. For information about caveats in the Cisco IOS Release 12.0, refer to the “Caveats” sections in the *Cross-Platform Release Notes for Cisco IOS Release 12.0* document located on CCO and the Documentation CD-ROM.

In addition, caveats from Cisco IOS Release 11.3(9)DB2 and Cisco IOS Release 12.0(5)DC also apply to Cisco IOS Release 12.0(7)DC1. Information regarding these caveats can be found in *Release Notes for Cisco 6400 NRP for Cisco IOS Release 11.3(9)DB2* and *Release Notes for Cisco 6400 NRP for Cisco IOS Release 12.0(5)DC*, respectively.

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. Bug Navigator II can be found at <http://www.cisco.com/support/bugtools>, or from CCO, select **Technical Assistance Center: Software Bug Toolkit**.

Open Caveats - Release 12.0(7)DC1

There are no open caveats specific to Cisco IOS Release 12.0(7)DC1 that require documentation in the release notes.

Resolved Caveats - Release 12.0(7)DC1

All the caveats listed in this section are resolved in Release 12.0(7)DC1. This section describes severity 1, 2, and selected severity 3 caveats.

- CSCdw65903

An error can occur with management protocol processing. Please use the following URL for further information:

<http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903>

Open Caveats - Release 12.0(7)DC

This section describes possibly unexpected behavior by Release 12.0(7)DC. This section describes severity 1, 2, and selected severity 3 caveats.

- CSCdp19647

After all NRP-SSG users log off a specific service, the service object is cleared, but the subblock associated with the interface is not reset. As a result, all traffic from the interface is still treated by NRP-SSG as downstream traffic.

Workaround (do one of the following):

 - Enter the **no ssg bind direction uplink** global configuration command for the affected interface.
 - Reload the NRP
- CSCdp29451

Changing service binding while using the service might cause an inconsistency in the service binding table and break the NRP-SSG data path forwarding table.

Workaround: Avoid changing service binding while the service is in use.
- CSCdp42210

Problem symptom: The NRP ATM interface stops to transmit. (This problem only happens at one customer's site). We can not reproduce the problem in the "DevTest" lab and have not received any other customer's report on this problem.

Workaround: issue a **shut** command followed by a **no shut** command.
- CSCdp59354

The traffic coming from FE interface on the NRP, with ISL encapsulation, forwarded out of the ATM RBE interface, might not be fast-switched but process switched when bridge irb is configured on the NRP.

The workaround is to remove the "bridge irb" statement from the configuration.
- CSCdp60255

PPPoE sessions terminated on a 6400 do not release IP addresses in the pool. This exhausts the pool way too fast. There is no workaround.
- CSCdp62927

CPU hog messages appear on the NRP console when performing a shutdown/no shutdown on the ATM interface of the NRP configured with 2000 RBE sessions. This might cause RBE traffic to freeze. There is no workaround.
- CSCdp73529

Sometimes the escape sequence does not work on the NRP. For example, during an extended ping, one is unable to escape using either the default escape sequence CTRL+SHFT+6,x or a user defined one such as "escape-character 3" on the console "line con 0". There is no workaround.
- CSCdp79358

When aal5cisco encapsulation is used, traffic with 1514 packet size coming from L2TP session to PPPoA client experiences a performance drop when compared with that of Cisco IOS Release 12.0(5)DC. For other packet sizes or other encapsulations (such as aal5mux), the performance number is comparable to Cisco IOS Release 12.0(5)DC.

Workaround: Change the encapsulation to aal5mux.

- CSCdp82287

The upstream traffic for PPPOE is not showing up under the main ATM interface counters. If you send packets from a PPPOE client, the ATM interface counters for the ingress direction will not increase.

There is no workaround.
- CSCdp86322

When an NRP-SSG subscriber exceeds the maximum number of services determined by the **ssg maxservice** global configuration command, the Cisco SSD incorrectly displays the following message: “The server returned an invalid or unrecognized response.”

The correct message reads: “You have reached the maximum allowed number of concurrently logged in services for your system, *host-ID*. Please logoff of at least one service, and try your service logon request again.”

Workaround: Simply click the “Ok” button to recognize the error, and select the service on the viewService frame again. The correct message will appear.
- CSCdp90880

The NRP-LNS occasionally crashes if you enter the following command sequence with a configuration of 50 tunnels and 1326 PPPoA sessions: (1) **write erase**, (2) **reload**, (3) **copy tftp running-config**.

Workaround: Avoid the stated operation sequence.
- CSCdp93303

Using WebConsole, when you click the "configure" button for an NRP, you might get an error message in your browser indicating that the browser cannot locate the server. There is no known workaround.
- CSCdr07190

Cisco IOS Release 12.0(7)DC supports L2TP as a service type. When you have a L2TP service type configured, the subscriber can start the service using the Cisco SSD. The subscriber can also start the service using PPPoA or PPPoE if you have configured this service as “Auto logon” for this subscriber. This problem happens if you configured L2TP type of service with PPPoA or PPPoE. There is no workaround.
- CSCdr07853

Cisco IOS Release 12.0(7)DC supports L2TP as a service type. When you have a L2TP service type configured, the subscriber can start the service using the Cisco SSD. The subscriber can also start the service using PPPoA or PPPoE if you have configured this service as “Auto logon” for this subscriber. This problem happens if you configured L2TP type of service with PPPoA or PPPoE. There is no workaround.
- CSCdr08555

The **vpdn softshut** global configuration command does not function with NRP-SSG.
- CSCdr08602

The **vpdn session-limit** global configuration command does not function with NRP-SSG.

- CSCdr12244
If Cisco Express Forwarding (CEF) is turned on globally while using NRP-SSG with a PPPoA client and selected service type L2TP, NRP-SSG data-path forwarding breaks.
Workaround: Enter the **no ip route-cache cef** global configuration command for the affected interface.
- CSCdr15067
The command syntax help (using the “?” in the CLI) does not work for the **ip wccp** global configuration commands. To view the command menu, enter the **show ip wccp EXEC** command.
- CSCdr82841
When the Service Selection Gateway (SSG) is enabled after an upgrade from Cisco IOS Release 12.0(3) DC or Release 12.0(5) DC to Release 12.0(7) DC, the SSG transparent passthrough feature is no longer supported.
Workaround: To enable non-SSG connections to pass through the NRP, disable the SSG with the **no ssg enable** command.

Resolved Caveats - Release 12.0(7)DC

All the caveats listed in this section are resolved in Release 12.0(7)DC. This section describes severity 1, 2, and selected severity 3 caveats.

- CSCdm53112
By turning on fast switching on an ATM subinterface doing RFC1483 routing, IP connectivity is lost.
- CSCdm87040
The 6400 NRP FE interface cannot be run in full-duplex mode.
- CSCdm89963
This bug deals with inconsistent alarm reporting of FE ports on the NRP. If there is no cable in the FE port of the NRP some Cisco 6400s will display and alarm and others will not. This needs to be made consistent. Also no alarm should be reported if the port is in “admin down” state.
- CSCdm94174
If a permanent virtual circuit (PVC) or virtual channel identifier (VCI) is added to a subinterface and then an identifier is added, the router might reload with memory corruption after exiting the configuration mode. There is no workaround.
- CSCdm94751
PPPoE compatibility with other vendors products.
- CSCdp21524
A Cisco 6400 node route processor (NRP) that is running Cisco IOS Release 12.0(3)DC might receive a malformed packet. In this situation, the NRP declares the RADIUS server dead. There is no workaround.
- CSCdp23734
NRP-SSG does not switch anymore if NRP only is reloaded.
- CSCdp24654
Erroneous RADIUS accounting logging on the remote RADIUS server.

- CSCdp25103

When configuring several hundred PPPoA VCs under a single sub-interface via the use of a VC-class statement, some of the VCs may end up with a Virtual-Access Interface Number of 0. The only way to get a valid VA number and get the VC functional is to delete it and reconfigure it.

To avoid this problem you have a number of options:

a) Do not use VC-class statements

b) Netboot the config, and ensure when netbooting the config that the physical interface is shutdown prior to configuring, and then bring it up.

Example:

```
...
int atm 2/0
shut
int atm 2/0.1 multipoint
pvc DSLAIC32 1/32
...
int atm 2/0.2 multi
....
int atm 2/0
no shut
int eth 3/0
...
```

A possible third solution that has not had much lab testing is to reduce the number of VCs in each sub-int that is using VC-class statements to the teens.

- CSCdp46737

On an NRP configured for PPPoA, it is possible to end up in a situation where subscriber traffic is able to reach the Cisco 6400, but does not pass through it. In other words, you can ping the FE interface but not beyond. This is caused by an NRP-SSG host object being created for the PPPoA session and the packets are dropped by NRP-SSG.

To work-around this problem, please configure **ssg disable** or split the subscriber traffic between multiple NRPs with the SSG traffic going to 1 NRP, and the non-SSG traffic going to a second NRP.

- CSCdp55823

Router crash in pref__C9RWString on NRP.

- CSCdp55964

PPPoE sessions are not CEF/fast-switched.

- CSCdp56022

A 6400 NRP running PPPoE and IRB simultaneously might see some spurious memory accesses. This problem does not seem to have any adverse impact on the router.

- CSCdp73152

Issuing a telnet session to the NRP via to ethernet port, And we then request a connection to a remote device connected On the ATM side, if "pasting" too much data at once on the session The router will freeze on almost all connected port, except the console. The ATM 0/0/0 will show a lot of input-queue drops and will be wedge. The ethernet port doesn't report anything particular.

To this was the way the problem was reproduce, the problem occur At customer site also, in that case it is not very clear what the cause Is but the problem is identical as well as the symptoms.

A loss of connections to the NRP, is also reported by The customer, while I was doing the test, I also notice, that my telnet get very slow, when this occur, sometimes we cannot recover.

The console is always accessible.

- CSCdp76989

RADIUS attribute 43 is sent with value=0 in Radius Accounting updates.

That attribute is supposed to report the amount of traffic an end-user has generated during his session.

- CSCdp83038

When Radius/AAA is configured on the Cisco 6400 and accessed, the Cisco 6400 will reboot. The stack dump shows that everything is normal.

- CSCdr03903

NRP crashes on receipt of RADIUS packet.

Related Documentation

This section describes the documentation related to the Cisco 6400 UAC NRP, typically including hardware installation guides, software installation guides, Cisco IOS configuration and command references, system error messages, and feature modules that are updates to the Cisco IOS documentation set. Documentation is available as printed manuals or electronic documents, except for the feature modules that are available online only.

You can find the most up-to-date documentation on the Web via Cisco Connection Online (CCO) and the Documentation CD-ROM. These electronic documents might contain updates and modifications made after the hard copy documents were printed.

These release notes should be used with the documents listed in the following sections:

- Release-Specific Documents, page 15
- Platform Documents, page 16
- Feature Modules, page 17
- Cisco IOS Software Document Set, page 18

Release-Specific Documents

The following documents are specific to Release 12.0 T. They are located on CCO and the Documentation CD-ROM:

- *Release Notes for Cisco IOS Release 12.0 T:*

To access the cross-platform *Release Notes for Cisco IOS Release 12.0 T* on CCO, follow this path:

Service and Support: Technical Documentation: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

To access the cross-platform *Release Notes for Cisco IOS Release 12.0* on the Documentation CD-ROM, follow this path:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Release Notes: Cross-Platform Release Notes

- Product bulletins, field notices, and other release-specific documents:
To access these documents, refer to the Software Center at this path on CCO:

Service and Support: Technical Documentation

- Caveat documents:
As a supplement to the caveats listed in the “Caveats” section in these release notes, see the *Caveats for Cisco IOS Release 12.0 T* document, which contains caveats applicable to all platforms for all maintenance releases of Release 12.0 T.

To access the caveat document on CCO, follow this path:

Service and Support: Technical Documentation: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

To access the caveat document on the Documentation CD-ROM, follow this path:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS 12.0: Caveats: Caveats for Cisco IOS Release 12.0 T

Note If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. Bug Navigator II can be found at <http://www.cisco.com/support/bugtools>, or from CCO, select **Software & Support: Tools: Bug Toolkit II**.

Platform Documents

The documents listed in Table 4 are available for the Cisco 6400 UAC. These documents are also available online at Cisco Connection Online (CCO) and on the Documentation CD-ROM.

To access Cisco 6400 documentation on CCO, follow this path:

Service and Support: Technical Documents: Documentation Home Page: DSL Products: Cisco 6400

To access Cisco 6400 documentation on the Documentation CD-ROM, follow this path:

DSL Products: Cisco 6400

Table 4 Platform Documents for the Cisco 6400 Universal Access Concentrator

Document Title	Chapter Topics
<i>Cisco 6400 UAC Hardware Installation Guide</i>	About This Manual Hardware Description Preparing for Installation Installing the Cisco 6400 Troubleshooting Maintaining the Cisco 6400 System Specifications Glossary Configuration Worksheets Installing the AC-Input Power Shelf and Power Supply

Table 4 Platform Documents for the Cisco 6400 Universal Access Concentrator (continued)

Document Title	Chapter Topics
<i>Cisco 6400 UAC Site Planning Guide</i>	About This Guide Cisco 6400 Overview Site Planning Considerations System Specifications Cabling Specifications Glossary
<i>Regulatory Compliance and Safety Information for the Cisco 6400</i>	Overview of the Cisco 6400 Universal Access Concentrator General Documentation Information Agency Approvals Translated Safety Warnings Cisco Connection Online
<i>Cisco 6400 UAC Software Configuration Guide and Command Reference</i>	About This Guide Product Overview and Configuration Cisco IOS Software Fundamentals Using the Web Console Configuring the NSP Configuring System Features Configuring the NRP Configuring Interfaces Command Reference MIB Information Resolving Error Messages Glossary
<i>Cisco 6400 UAC FRU Installation and Replacement</i>	Tools and Equipment Required General Safety Precautions and Maintenance Guidelines Replacing the Front Cover Powering Down the System Backing Up the PCMCIA Card Maintaining the Air Filter Replacing an NSP Module Replacing an NRP Module Installing or Replacing a Half-Height NLC Replacing a PEM Replacing the Blower Module and Fans Verifying Plug-In Module and Component Installation

Feature Modules

Feature modules describe new features supported by each Cisco IOS Release, and are only available online. Each feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference for new and modified commands.

To reach the feature modules for Cisco IOS Release 12.0(7)DC1 on the CCO home page, click on this path:

Service & Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation: New Features in 12.0-Based Limited Lifetime Releases: New Features in Release 12.0DC: New Features in Release 12.0(7)DC

To reach the feature modules for Cisco IOS Release 12.0(7)DC on the Documentation CD-ROM, click on this path:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0: New Feature Documentation: New Features in 12.0-Based Limited Lifetime Releases: New Features in Release 12.0DC: New Features in Release 12.0(7)DC

Cisco IOS Software Document Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents. These documents are shipped with your order in electronic form on the Documentation CD-ROM, unless you specifically ordered the printed versions.

Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality and contain comprehensive configuration examples. Chapters in a command reference provide complete command syntax information. Each configuration guide can be used in conjunction with its corresponding command reference.

To reach these documents on CCO, click on this path:

Service and Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0: Configuration Guides and Command References

To reach these documents on the Documentation CD-ROM, click on this path:

Cisco IOS Software Configuration: Cisco IOS Release 12.0: Cisco IOS Release 12.0 Configuration Guides and Command References

To access documentation related to an index entry, click on the page number following the entry.

Release 12.0 Documentation Set

Table 5 details the contents of the Cisco IOS Release 12.0 software documentation set. The document set is available in electronic form, and also in printed form upon request.

Note The most current Cisco IOS documentation can be found on the latest Documentation CD-ROM and on the Web. These electronic documents might contain updates and modifications made after the paper documents were printed.

To access the Cisco IOS documentation set on CCO, follow this path:

Service and Support: Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.0

You can reach the Cisco IOS documentation set on the Documentation CD-ROM at:

Cisco Product Documentation: Cisco IOS Software Configuration: Cisco IOS Release 12.0

Table 5 Cisco IOS Software Release 12.0 Documentation Set

Books	Chapter Topics
<ul style="list-style-type: none"> • <i>Configuration Fundamentals Configuration Guide</i> • <i>Configuration Fundamentals Command Reference</i> 	Configuration Fundamentals Overview Cisco IOS User Interfaces File Management System Management
<ul style="list-style-type: none"> • <i>Bridging and IBM Networking Configuration Guide</i> • <i>Bridging and IBM Networking Command Reference</i> 	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ STUN and BSTUN LLC2 and SDLC IBM Network Media Translation DSPU and SNA Service Point SNA Frame Relay Access Support APPN Cisco Database Connection NCIA Client/Server Topologies Cisco Mainframe Channel Connection Airline Product Set
<ul style="list-style-type: none"> • <i>Dial Solutions Configuration Guide</i> • <i>Dial Solutions Command Reference</i> 	X.25 over ISDN Appletalk Remote Access Asynchronous Callback, DDR, PPP, SLIP Bandwidth Allocation Control Protocol ISDN Basic Rate Service ISDN Caller ID Callback PPP Callback for DDR Channelized E1 & T1 Dial Backup for Dialer Profiles Dial Backup Using Dialer Watch Dial Backup for Serial Lines Peer-to-Peer DDR with Dialer Profiles DialOut Dial-In Terminal Services Dial-on-Demand Routing (DDR) Dial Backup Dial-Out Modem Pooling Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Dialup Networks Dial Business Solutions and Examples
<ul style="list-style-type: none"> • <i>Cisco IOS Interface Configuration Guide</i> • <i>Cisco IOS Interface Command Reference</i> 	Interface Configuration Overview LAN Interfaces Logical Interfaces Serial Interfaces
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 1</i> • <i>Network Protocols Command Reference, Part 1</i> 	IP Overview IP Addressing and Services IP Routing Protocols
<ul style="list-style-type: none"> • <i>Network Protocols Configuration Guide, Part 2</i> • <i>Network Protocols Command Reference, Part 2</i> 	AppleTalk Novell IPX

Related Documentation

Table 5 Cisco IOS Software Release 12.0 Documentation Set (continued)

Books	Chapter Topics
<ul style="list-style-type: none">• <i>Network Protocols Configuration Guide, Part 3</i>• <i>Network Protocols Command Reference, Part 3</i>	Network Protocols Overview Apollo Domain Banyan VINES DECnet ISO CLNS XNS
<ul style="list-style-type: none">• <i>Security Configuration Guide</i>• <i>Security Command Reference</i>	AAA Security Services Security Server Protocols Traffic Filtering and Firewalls IP Security and Encryption Passwords and Privileges Neighbor Router Authentication IP Security Options
<ul style="list-style-type: none">• <i>Cisco IOS Switching Services Configuration Guide</i>• <i>Cisco IOS Switching Services Command Reference</i>	Switching Services Switching Paths for IP Networks Virtual LAN (VLAN) Switching and Routing
<ul style="list-style-type: none">• <i>Wide-Area Networking Configuration Guide</i>• <i>Wide-Area Networking Command Reference</i>	Wide-Area Network Overview ATM Frame Relay SMDS X.25 and LAPB
<ul style="list-style-type: none">• <i>Voice, Video, and Home Applications Configuration Guide</i>• <i>Voice, Video, and Home Applications Command Reference</i>	Voice over IP Voice over Frame Relay Voice over ATM Voice over HDLC Frame Relay-ATM Internetworking Synchronized Clocks Video Support Universal Broadband Features
<ul style="list-style-type: none">• <i>Quality of Service Solutions Configuration Guide</i>• <i>Quality of Service Solutions Command Reference</i>	Policy-Based Routing QoS Policy Propagation via BGP Committed Access Rate Weighted Fair Queueing Custom Queueing Priority Queueing Weighted Random Early Detection Scheduling Signaling RSVP Packet Drop Frame Relay Traffic Shaping Link Fragmentation RTP Header Compression
<ul style="list-style-type: none">• <i>Cisco IOS Software Command Summary</i>• <i>Dial Solutions Quick Configuration Guide</i>• <i>System Error Messages</i>• <i>Debug Command Reference</i>	

Service and Support

For service and support for a product purchased from a reseller, contact the reseller. Resellers offer a wide variety of Cisco service and support programs, which are described in the section “Service and Support” in the information packet shipped with your product.

Note If you purchased your product from a reseller, you can access CCO as a guest. CCO is the primary real-time support channel for Cisco Systems. Your reseller offers programs that include direct access to CCO services.

For service and support for a product purchased directly from Cisco, use CCO.

Software Configuration Tips on the Cisco Technical Assistance Center Home Page

If you have a CCO login account, you can access the following URL, which contains links and tips on configuring your Cisco products:

http://www.cisco.com/kobayashi/technotes/serv_tips.shtml

This URL is subject to change without notice. If it changes, point your Web browser to CCO and click on this path: **Technical Assistance Center: Technical Tips.**

The following sections are provided from the Technical Tips page:

- Access Dial Cookbook—Contains common configurations or recipes for configuring various access routes and dial technologies.
- Field Notices—Designed to provide notification of any critical issues regarding Cisco products. These notices include problem descriptions, safety or security issues, and hardware defects
- Hardware—Technical Tips related to specific hardware platforms
- Hot Tips—Popular tips and hints gathered from the Cisco Technical Assistance Center (TAC). Most of these documents are available from the TAC FAX-on-demand service. To reach FAX-on-demand and receive documents at your FAX machine from the USA, call 888-50-CISCO (888-502-4726). From other areas, call 650-596-4408.
- Internetworking Features—Tips on using and deploying Cisco IOS software features and services
- Sample Configurations—Actual configuration examples—examples complete with topology and annotations
- Software Products—MultiNet & Cisco Suite 100, Network Management, Cisco IOS Software Bulletins, and CiscoPro Configurations
- Special Collections—Other Helpful Documents, including Case Studies, References & RFCs, and Security Advisories.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: http://www.cisco.com/public/countries_languages.shtml
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at <http://www.cisco.com>, <http://www-china.cisco.com>, or <http://www-europe.cisco.com>.

If you are reading Cisco product documentation on the World Wide Web, you can submit comments electronically. Click **Feedback** in the toolbar and select **Documentation**. After you complete the form, click **Submit** to send it to Cisco. We appreciate your comments.

This document is to be used in conjunction with the documents listed in the “Related Documentation” section on page 15.

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