

# Release Notes for the Access Operating System (AOS), Release 5.0.3

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**Corporate Headquarters**  
Redback Networks Inc.  
250 Holger Way  
San Jose, CA 95134-1362  
USA  
<http://www.redback.com>  
Tel: 408-571-5000

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# Supported Hardware

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The Access Operating System (AOS) Release 5.0 software supports the following Subscriber Management System hardware platforms:

- SMS 10000
- SMS 1000 and SMS 1800
- SMS 500

## SMS 10000

This section describes the system modules and interface modules supported in the AOS Release 5.0 software on the SMS 10000 platform.

### System Modules

The SMS 10000 platform supports the following system modules:

- One or two System Manager (SM) modules
- One or two Ethernet Management modules
- Three or four Switch Fabric 42G modules
- One or two Timing modules
- Up to 12 Connection Manager (CM) modules

### Interface Modules

The SMS 10000 platform supports up to 24 I/O modules. The SMS 10000 supports the following I/O modules:

- Two-port 155-Mbps ATM OC-3c (Single-mode Fiber [SMF] or Multimode Fiber [MMF])
- Two-port 155-Mbps POS OC-3c (SMF or MMF)
- Two-port 10/100-Mbps Ethernet Auto-Sensing
- Two-port 45-Mbps Clear-Channel DS-3
- Two-port 45-Mbps Channelized DS-3
- Two-port 45-Mbps ATM DS-3
- Eight-port 1.544-Mbps Packet T1
- Eight-port 2.048-Mbps Packet E1
- Two-port Gigabit Ethernet (SMF [LX] or MMF [SX])
- Two-port 622-Mbps POS OC-12c (SMF or MMF)

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## Software Features

The SMS 10000 platform supports up to 100,000 active subscribers.

All AOS features are supported on the SMS 10000 hardware platform, except for IP Security.

## SMS 1000 and SMS 1800

This section describes the system modules and interface modules supported in the AOS Release 5.0 software on the SMS 1000 and SMS 1800 platforms.

### System Modules

The SMS 1000 and SMS 1800 platforms support the following system modules:

- Control Engine One (CE1), Control Engine Two (CE2), or Control Engine Three (CE3) module
- 8-MB Forwarding Engine One (FE1), 16-MB or 48-MB Forwarding Engine Two (FE2), or 64-MB Forwarding Engine Three (FE3) module

**Note** The 4-MB FE1 module is no longer supported. Contact your technical support representative if you have production SMS 1000 systems using 4-MB FE1 module.

- IPSec/Compression Transform Engine (TE) module (required to utilize the IP Security features supported by the AOS software)

### Interface Modules

The SMS 1000 and SMS 1800 platforms support the following I/O modules:

- Two-port 155-Mbps ATM OC-3c MMF, Version 1 or Version 2
- Two-port 155-Mbps ATM OC-3c SMF, Version 1 or Version 2
- Two-port 45-Mbps ATM DS-3, Version 1 or Version 2
- Two-port 10/100-Mbps Ethernet Auto-Sensing
- Two-port 45-Mbps Clear-Channel DS-3
- Two-port 52-Mbps HSSI
- Two-port 45-Mbps Channelized DS-3
- Eight-port 1.544-Mbps Packet T1
- Eight-port 2.048-Mbps Packet E1

## Software Features

The SMS 1000 and SMS 1800 platforms support up to 8,000 active subscribers when configured with a CE3 module and a 48-MB FE2 module; SMS 1000 and SMS 1800 platforms support up to 10,000 active subscribers when configured with a CE3 module and a 64-MB FE3 module.

All AOS features are supported on the SMS 1000 and SMS 1800 hardware platforms.

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## SMS 500

This section describes the system modules and interface modules supported in the AOS Release 5.0 software on the SMS 500 platform.

### System Modules

The SMS 500 platform supports the following system modules:

- Control Engine (CE)-500 (all hardware revision levels)
- Forwarding Engine (FE)-500 (all hardware revision levels)

### Interface Modules

The SMS 500 platform supports the following I/O modules:

- One-port 155-Mbps ATM OC-3c MMF
- One-port 155-Mbps ATM OC-3c SMF
- One-port 45-Mbps ATM DS-3
- One-port 10/100-Mbps Ethernet Auto-Sensing
- One-port 45-Mbps Clear-Channel DS-3
- Four-port 1.544-Mbps Packet T1
- Four-port 2.048-Mbps Packet E1
- Four-port 1.544-Mbps ATM T1, with inverse multiplexing over ATM (IMA)

### Software Features

The SMS 500 platform supports up to 2,000 active subscribers.

All AOS features are supported on the SMS 500 hardware platform, except for IP Security.

### PCMCIA Modules

Not all PCMCIA cards are the same. The AOS software recognizes all PCMCIA cards sold by Redback. To ensure successful operation, purchase PCMCIA cards for your SMS device from Redback.

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# What's New in AOS Release 5.0

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This section describes the new features and software enhancements supported in the AOS Release 5.0 software.

## 802.1Q Encapsulation

This release adds support for 802.1Q encapsulation on Ethernet ports, Asynchronous Transfer Mode (ATM) circuits, and Frame Relay circuits, through the creation of 802.1Q permanent virtual circuits (PVCs). This feature adds to the existing 802.1Q internetworking capabilities supported by the AOS software.

## AAA/RADIUS

This release adds support for several new authentication, authorization, and accounting (AAA) and Remote Authentication Dial-In User Service (RADIUS) features:

- You can configure the system to first attempt local authentication, then attempt authentication via RADIUS.
- You can configure the system to send RADIUS requests using any interface IP address as the source address.
- This release adds support for the Acct-Tunnel-Connection attribute (68) described in RFC 2867, *RADIUS Accounting Modifications for Tunnel Protocol Support*.
- This release adds support for the Ascend-Data-Filter attribute (242) for downloading dynamic access lists via RADIUS.
- The software sends the ATM or Frame Relay profile name instead of the connection speed in the Connect-Info attribute (77); see RFC 2869, *RADIUS Extensions*.

## ATM and Frame Relay Circuit Configuration

The command-line interface (CLI) for configuring ATM and Frame Relay circuits has been enhanced. The updated interface enables you to create large ranges of ATM or Frame Relay circuits using minimal space in the configuration files and simplifies the interface for creating on-demand circuits.

If you currently use the on-demand circuit creation feature, you must modify your configuration files to configure on-demand circuits in this release of the software. If you use explicit circuit creation to create ranges of ATM or Frame Relay circuits, you do not need to modify your configuration file; however, you can use the new explicit circuit creation commands to reduce the size of your configuration files.

The following PVC-related commands are obsolete in this release of the software:

- **atm pvc default**—port configuration mode
- **circuit creation**—port configuration mode
- **circuit prefix-string**—port configuration mode



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- **circuit range**—port configuration mode
  - **frame-relay pvc default**—port configuration mode
  - **show atm range**—operator exec mode

The following PVC-related commands are new or modified in this release of the software:

- **atm pvc explicit**—port configuration mode
- **atm pvc on-demand**—port configuration mode
- **frame-relay pvc explicit**—port configuration mode
- **frame-relay pvc on-demand**—port configuration mode

See the *Access Operating System (AOS) Configuration Guide* and the *Access Operating System (AOS) Command Reference* publication for additional information.

## Bulkstats

This release of the software supports the following new bulk statistics features:

- Context-level schema definition—Use the **bulkstats schema** command in context configuration mode to configure a bulkstats schema for a context.
- Tunnel-level schema definition—Use the **bulkstats schema** command in L2TP peer configuration mode to configure a tunnel mode schema.
- New variables—This release supports new AOS variables defining receive packets dropped and transmit packets dropped. You can use these variables for port, circuit, tunnel, and subscriber schemas.

## DHCP

You can configure the system to act as a Dynamic Host Configuration Protocol (DHCP) server. Use the new **dhcp max-addr**s command in subscriber configuration mode to limit the number of addresses assigned to a subscriber.

You can configure the system to send AAA accounting records for packets received, packets sent, bytes received, and bytes sent to the RADIUS server for DHCP clients.

## GRE

The generic routing encapsulation (GRE) feature is supported on all hardware platforms. You can use RADIUS to configure on-demand GRE tunnel creation. This feature can be used to support hub-and-spoke IP-based Virtual Private Networks (VPNs).

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## IP Routing

This release adds support for the following IP and IP routing features:

- IRDP—You can configure the system to use the Internet Control Message Protocol (ICMP) Router Discovery Protocol (IRDP) to enable hosts to learn their default route via router-transmitted advertisement packets instead of through manual configuration of the hosts.
- Equal Cost Multipath Routing—You can increase bandwidth utilization and provide redundancy by configuring the system to use up to six routes to a destination. This feature is supported for OSPF and static routes.
- OSPF NSSA—The AOS supports not-so-stubby-areas (NSSAs), an extension of Open Shortest Path First (OSPF) stub areas, per Internet Draft, *The OSPF NSSA Option*, draft-ietf-ospf-nssa-update-09.txt.
- Use the new **ip ignore-df-bit** command in interface configuration mode to configure an interface to ignore the IP Don't Fragment bit.



**Caution** This command can affect the performance of the SMS device and the behavior of other systems in the network. Consult your technical support representative prior to using this feature.

## L2TP

This release of the software supports the following new Layer 2 Tunneling Protocol (L2TP) features:

- Use the new **attribute calling-number real-circuit-id** command in context configuration mode to configure the system to send the real circuit ID in the Calling-Number attribute (22). This preserves compatibility with RADIUS servers that are configured to use the Calling-Number attribute.
- The AOS software supports multiple tunnels with the same name; this feature enhances compatibility with Windows L2TP clients.
- Secondary tunnel password—You can configure a secondary tunnel password to allow for tunnel failover.
- Use the new **l2tp radius auto-group** command in context configuration mode to configure the system to automatically create a tunnel group when RADIUS returns multiple tunnels grouped by tag values. You can disable auto-grouping and use the Tunnel-Preference RADIUS attribute defined in RFC 2868, *RADIUS Attributes for Tunnel Support*, to specify a list of tunnels ordered by preference.
- The software sends PPP over Ethernet (PPPoE) Hype URLs (HURLs) across an L2TP tunnel using a vendor-specific attribute (VSA).
- Idle timeout—Use the new **l2tp eth-sess-idle-timeout** command in global configuration mode to configure a timeout that is specific to Ethernet traffic (does not consider PPP traffic). This command specifies the time between polls of the L2TP session statistics. If the inbound or outbound packet statistics show no change from the last poll, the session is considered idle and is ended.
- You can configure an Ethernet over L2TP tunnel to allow only PPPoE sessions.

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## Network Management

This release of the software adds support for the following new network management features:

- SMS 10000 web interface.
- Simple Network Management Protocol (SNMP) enhancements:
  - You can configure the source IP address for SNMP packets.
  - The AOS software supports the Redback Networks enterprise subscriber Management Information Base (MIB). You can use this MIB to view and modify subscriber configuration and statistics information.
  - You can configure the system to use a single community string for all contexts. The system generates the community string in the form *community-name* for the local context and *community-name@ctx-name* for all other contexts on the system.
  - You can clear subscriber sessions via SNMP.
- Remote session reservations—You can configure the system to reserve remote sessions for a particular IP address or administrator. This guarantees that the specified number of remote sessions (Telnet, Secure Shell [SSH], or HTTP) are available for use by the preferred IP address, or the preferred administrator.

## Miscellaneous

This release of the software adds support for the following new features and enhancements:

- Cisco High-Level Data Link Control (HDLC) and Frame Relay encapsulation on all Packet over SONET (POS) I/O modules.
- Subscriber-based bindings for multiencapsulated circuits—You can configure subscriber-based bindings for multiencapsulated circuits.
- ATM circuit debugging—Use the new **debug atm** command in administrator exec mode to enable debugging of ATM circuits on a per-port, virtual path identifier (VPI), or virtual connection identifier (VCI) basis.
- Auto-more feature enhancements—The AOS provides several options for searching the command output for patterns, and modifying the output displayed.

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# Upgrading to AOS Release 5.0

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The *Access Operating System (AOS) Configuration Guide* provides extensive information about upgrading your system image. This section provides an abbreviated version of the “Loading and Maintaining the System” chapter; see the *Access Operating System (AOS) Configuration Guide* for more information.



**Caution** If you have an SMS 10000 system that is running AOS Release 4.0.3 software, your system requires a field upgrade to run the AOS Release 5.0.3 software. Failure to perform the upgrade prior to installing this release of the software renders the system inoperable and requires that you return the system to the factory for repair. Contact your technical support representative to arrange for the field upgrade; do not use the procedures in this section prior to performing the field upgrade.

**Note** Upgrading your system image requires the Trivial File Transfer Protocol (TFTP) and a host computer running a TFTP server.

The method you choose for upgrading your image depends on how you boot the SMS device:

- Boot via the Local Flash File System
- Boot via TFTP from an Explicit Image
- Boot via TFTP from an Image Specified by a BOOTP Server

## Boot via the Local Flash File System

If you are booting off the local flash file system, you must copy the image from the TFTP server to the flash file system.

**Note** If you are upgrading from a release earlier than AOS Release 2.2, you can make a copy of the image in flash memory and skip the first step. If you are upgrading from AOS Release 2.2, or later, and have a CE1, CE2, CE3, or CE-500 without PCMCIA expansion flash modules, flash memory does not have enough space to store two versions of the image. The process in this section assumes that you cannot store two versions of the image.

1. Boot across the network using the Bootstrap Protocol (BOOTP), or TFTP, or both to ensure that the new image you want to load works correctly. For more information, see the “Network Loading the System” section in the *Access Operating System (AOS) Configuration Guide*.
2. Copy the new image from the TFTP server to the flash file system. In the following example, the IP address of the TFTP server is 10.1.1.1, and the new image is stored in a file named `redback.bin`:

```
[local]RedBack#copy tftp://10.1.1.1/redback.bin /flash/redback.bin
```

**Note** Ensure that the image you copy uses the same name as your existing image. If it does not, delete the existing image before you perform this step.

- 
3. Reload the system by entering the following command in administrator exec mode:

```
[local]RedBack#reload
```

## Boot via TFTP from an Explicit Image

If the SMS device is configured to boot using TFTP from a named file on a specific host, then upgrading the system image involves changing the name of the file in the boot loader, or swapping the files on the TFTP server.

Follow these steps to boot via TFTP from an explicit image:

1. To change the name of the file read by the boot loader at system boot time, restart the system using the following command in administrator exec mode:

```
[local]RedBack#reload
```

Interrupt the normal boot process by pressing any key when the system indicates that this is possible. In the following example, the administrator presses **3** to interrupt the normal boot process:

```
Press any key to stop auto-boot...
```

```
3
```

```
[RedBack Boot]:
```

Change the configuration by pressing **c** at the boot prompt. Press **Enter (Return)** to accept the existing setting of an item; enter the new value of the item and press **Enter (Return)** to change the setting of an item. In the following example, we change only the filename to be read at boot time from **/3\_1\_6\_0.bin** to **/5\_0\_3\_0.bin**:

```
[RedBack Boot]: c
```

```
',' = clear field; '-' = go to previous field; ^D = quit
```

```
boot device          : dc
processor number     : 0
host name            :
file name            : /3_1_6_0.bin /5_0_3_0.bin
inet on ethernet (e) :
inet on backplane (b):
host inet (h)        :
gateway inet (g)     :
user (u)             :
ftp password (pw) (blank = use rsh):
flags (f)            : 0xc0
target name (tn)     :
startup script (s)   :
other (o)            : dc
```

To view the current configuration of the boot loader, press **p**:

---

[RedBack Boot]: **p**

```
boot device      : dc
processor number : 0
file name       : /5_0_3_0.bin
flags (f)      : 0xc0
other (o)      : dc
```

After you have modified the appropriate boot parameters, initialize the system by entering the **@** character at the prompt.

[RedBack Boot]: **@**

A similar message to the following is displayed if the system is correctly loading:

```
Loading /redback.bin... 1554048 + 395560 + 486464
Image checksum verified.
Starting at 0x108000...
```

The system has completed its initialization and is ready for use when the following message is displayed:

```
Press <return> to connect...
```

2. Alternatively, you can change the filenames on your TFTP server such that the SMS device finds the new image under the same filename as it previously used to load the old image. See the documentation that came with your TFTP server to determine how to move and copy files on the TFTP server.

## Boot via TFTP from an Image Specified by a BOOTP Server

When booting the system via TFTP from an image specified by a BOOTP server, change the configuration of the BOOTP server for the SMS device to point to the new system image. The configurations of your BOOTP server and TFTP server are outside the scope of this document.

## Documentation Errata

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This section describes errors in the printed versions of the AOS and SMS documents.

### AOS Command Reference

This section describes errors in the printed version of the *Access Operating System (AOS) Command Reference* publication.

### AOS Functions, Chapter 1

This section states that AOS supports up to 10,000 subscribers. The AOS supports up to 100,000 active subscribers, depending on your hardware configuration. See the “Supported Hardware” section for additional information.

---

## load, Chapter 4

The command syntax omits the **dhcp-server** keyword. The correct syntax is:

**format** [/sm]/device [**dhcp-secured-arp** | **dhcp-server**]

Use the **dhcp-server** keyword to format a device for use as DHCP server nonvolatile storage. This option is valid only for PCMCIA synchronous RAM (SRAM) cards.

## police, Chapter 9

The correct range of values for the *rate* argument is 10 to 1,250,000.

## rate-limit, Chapter 9

The correct range of values for the *rate* argument is 10 to 1,250,000.

## PPP compression features, Chapter 23

PPP compression is not supported in this release of the software. The following commands are not supported as documented:

- **ppp compression** command in subscriber configuration mode
- **show ppp compression** command in operator exec mode

## show ppp compression, Chapter 23

This command is not supported in this release of the command

## L2X profile features, Chapter 25 and Chapter 26

The L2X profile feature is not supported in this release of the software. The following commands, described in Chapters 25 and 26, are not supported:

- **debug l2x** in administrator exec mode
- **l2x profile** in context configuration mode
- **min-subscribers** in l2x profile configuration mode
- **profile** in L2TP and L2F configuration modes

## load, Chapter 29

The command syntax omits the **dhcp-secured-arp** keyword. The correct syntax is:

**format** [/sm]/device [**dhcp-secured-arp** | **dhcp-server**]

Use the **dhcp-server** keyword to format a device for use as DHCP server nonvolatile storage. This option is valid only for PCMCIA SRAM cards.

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## AOS Configuration Guide

This section describes errors in the printed version of the *Access Operating System (AOS) Configuration Guide*.

### AOS Functions, Chapter 1

This section states that AOS supports up to 10,000 subscribers. The AOS supports up to 100,000 active subscribers, depending on your hardware configuration. See the “Supported Hardware” section for additional information.

### Command Modes, Chapter 2

The L2X profile feature is not supported in this release of the software; disregard the L2X profile configuration mode information in Figure 2-1 and Table 2-1.

### PPP Compression, Chapter 23

PPP compression is not supported in this release of the software. Disregard the “PPP Compression” section in Chapter 23.

### Table B-2, Appendix B

The following MIBs are missing from Table B-2:

MIB Name	Description
RBN-X-AAL5-VCL-STAT-MIB	Extension to RBN-AAL5-VCL-STAT-MIB.
RBN-X-ATM-PROFILE-MIB	Extension to the RBN-ATM-PROFILE-MIB.

### Table D-2, Appendix D

The following Redback Vendor-Specific L2TP attribute-value pairs (AVPs) are missing from Appendix D-2:

Num	AVP Name	Mandatory	May be Hidden	Message Types Used In	Notes
48	L2TP AVP RBAK Hurl	No	No	L2TP CM HURL	String. Sent to configure the <b>pppoe url</b> command for subscribers that are terminated on the LNS side of an L2TP tunnel.
49	L2TP AVI RBAK MOTD	No	No	L2TP CM HURL	String. Sent to configure the <b>pppoe url</b> command for subscribers that are terminated on the LNS side of an L2TP tunnel.

## SMS 1000 and SMS 1800 Hardware Guide

The printed version of the *SMS 1000 and 1800 Hardware Guide*, published in September 2000, contains the following editorial errors.



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## DC Power, page 2-12

The “DC Power” section omits the following information:

All conductors must be copper. Do not use conductors of different metals in a terminal or splicing connector. Coat bare conductors with an appropriate antioxidant before making crimp connections. Use Listed fastening hardware that is compatible with the materials used.

## Fan Trays, page 2-12

The caution statement in the “Fan Trays” section on page 2-12 is amended as follows:



**Caution** Fan trays are not hot-swappable. The system must be powered down before fan trays are removed and replaced. Failure to do this may cause damage to hardware components.

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## Caveats and Known Problems

This section describes the outstanding issues and limitations in this release of the software.

### ATM Virtual Path Shaping

ATM virtual path shaping is not supported in this release of the software.

### Equal Cost Multipath Routing

Equal cost multipath routing is not applied to L2TP sessions; all L2TP sessions use the same path that the tunnel uses. (22969)

### FE3 Module Upgrade

The FE3 module requires hardware upgrades in the SMS 1000 and SMS 1800 chassis when you upgrade from either the FE1 or FE2 module. You must upgrade the hardware prior to installing the FE3 module.

The FE3 module requires a fuse upgrade in the SMS 1000 and SMS 1800 chassis. See the *Forwarding Engine 3 (FE3) Upgrade Instructions* publication for information on upgrading the fuses.

The FE3 module also requires the installation of a load resistor kit on the SMS 1000 chassis. Contact your technical support representative to obtain upgrade information and the load resistor kit.

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## FE2 Module Upgrade

The FE2 module requires different fuses than an FE1 module in the SMS 1000 and SMS 1800 NEBS-compliant chassis. The FE1 module uses two 7.5-amp fuses in the fuse sockets labeled “F1” and “F2”. You must replace the fuses with a 15-amp and a 5-amp fuse for F1 and F2, respectively, prior to installing an FE2 module in the chassis. Contact your technical support representative to obtain upgrade information and the correct fuses.

**Note** The non-NEBS chassis does not contain any fuses.

## Hot-Swap Capabilities

This section describes known caveats and outstanding problems related to hot swapping.

### ATM OC-3 Modules

You cannot insert an ATM OC-3 module with assembly revision 0.2 or lower into a running system. If you try to insert any of these modules, your system may unexpectedly reload. (6619)

### CM Modules



**Caution** If the ejector on a CM module is opened, all operations on the CM module are halted and the message “Ejct” displays on the module’s 4CAD LED, a four-character alphanumeric display. Traffic running through the CM module is lost. When the ejector on the CM module is closed, the CM module reboots and resumes operation.

You can verify the status using the **show cm table** command in operator exec mode.

### SM Modules



**Caution** On a single-SM system, opening the ejector on the SM module halts all system operation. Current data is lost. The “Ejct” message displays on the module’s 4CAD LED. The system waits until the ejector on the SM module is closed to complete the reboot process.

If the ejector is opened on a standby SM module and the active SM module is operational, the standby module is halted. The “Ejct” message displays on the ejected module’s 4CAD LED. When the ejector is closed, the standby SM module reboots without affecting other modules in the system.

### Switch Fabric Modules

If the optional fourth switch fabric module is installed, one switch fabric module operates in hot standby. If the ejector on an active switch fabric module is opened, the system switches over to a standby fabric module transparently. The ejected fabric module’s LEDs flash to indicate the ejected state. You can verify status using the **show fabric counters** command in operator exec mode. System operation is seamless and there is no loss of data. If the ejector is opened on a standby fabric module, the module becomes inactive. When the ejector is closed on any switch fabric module, it becomes operational.



**Caution** Once the ejector is opened on any switch fabric module in the system, you are operating in nonredundant mode.

## Timing Modules

If the ejector on an active timing module is opened, the system switches over to a standby timing module. The ejected timing module is inactive.



**Caution** The changeover to the standby module is quick; however, there may be some loss of data.

An event is recorded in the system log. Link errors on the timing module switchover appear when the **show fabric counters** command in operator exec mode is entered.

## IP Security

The following problems exist in the IP security software:

- The **ipsec options pfs** command in IPsec peer configuration mode does not work correctly. (12445)
- The **ipsec mode aggressive** command in IPsec peer configuration mode does not work correctly; peers always come up in main mode. (12496)

## IP Source-Address Validation

The IP source-address validation (SAV) feature results in consumption of additional FE module memory (16 bytes per-subscriber address) and has a slight performance impact. Use the **show memory** command in operator exec mode to determine how much memory is available.

## L2TP/L2F

The following L2TP and L2F problems exist in this release of the software:

- On an SMS 10000, when you disable L2TP tunnel auto-grouping (using the **no l2tp radius auto-group** command in context configuration mode) and use the Tunnel-Preference RADIUS attribute defined in RFC 2868 to specify a list of PVC tunnels ordered by preference, you must configure a preference values for all tunnels in the list and specify tags for all tunnel values (default values from the untagged attributes are not applied to the tagged tunnels); failure to do so may result in a CM reload. (21550)
- On an SMS 10000, when you enable L2TP tunnel auto-grouping and use tagged PVC tunnels with preference values, a CM may reload. (22969)
- The L2X profile feature, including the ability to enter L2X profile configuration mode using the **l2x profile** command in context configuration mode, and the ability to set minimum subscribers for the profile, is not supported in this release. Disregard documentation for all l2x profile features. (22997, 22999)

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## NetOp Network Manager

Using the NetOp Network Manager for SMS, it is possible to configure Frame Relay PVCs on ports or HDLC channels that are not configured for Frame Relay encapsulation. This is a misconfiguration, and traffic does not flow on the PVCs. Verify that the encapsulation type on a port or HDLC channel is Frame Relay prior to creating Frame Relay PVCs on that port or HDLC channel. (19439)

## POS OC-12 I/O Modules

The following are known issues with the POS OC-12 I/O modules for the SMS 10000 platform running the AOS Release 5.0.3 software:

- With a load of 50% or higher, an OC-12 port configured with Point-to-Point Protocol (PPP) encapsulation may generate false LCP-Protocol-Reject messages. We do not expect this to cause interoperability problems, because the far end should ignore these messages.
- Only the ANSI Local Management Interface (LMI) type is supported for POS OC-12 ports configured with Frame Relay encapsulation.
- Due to a hardware issue, POS OC-12 ports configured with Frame Relay encapsulation send LMI Status messages that contain status for data link connection identifiers (DLCIs) 984 through 991, even if you have not configured these DLCIs on your system. This does not affect normal operation of the port; you can configure and use these DLCIs on a port, if preferred.

## Redundancy Features

When you reboot an SMS 10000 system that is configured with redundant SM modules, the system alternates which SM module is loaded. This can result in the system running with different configuration information, if the PCMCIA modules are not synchronized.

To configure the system to always boot from the same SM, configure the boot flag values according to Table 1.

**Table 1 SM Module Boot Flags**

Value	Description
0x40000	Always boot the SM module in slot 2.
0x80000	Always boot the SM module in slot 3.

See the “Change Boot Parameters” section of the “Loading System Images and Configuration Files” chapter in the *Access Operating System (AOS) Configuration Guide*.

## SONET APS

The Synchronous Optical Network (SONET) Automatic Protection Switching (APS) feature is not supported in this release of the software.

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## Miscellaneous

This section lists miscellaneous caveats and outstanding problems in the software.

- The use of the `!`, `|`, and `"` characters in AOS names (for example, context names, interface names, and so on) is discontinued in this release of the software; update your configuration files to remove these characters from any names.
- Your Telnet session may stop responding if you enter the **show bridge span-tree states** command in administrator exec mode when the system is processing heavy bridging traffic. (21775)
- The AOS software disables DHCP relay on an interface if you specify the value 65,536 for the **dhcp relay size** command in interface configuration mode.
- The **timeout idle** command in administrator configuration mode does not work correctly; the system does not log out sessions after the specified idle timeout value. (12152)
- The ATM DS-3 I/O module does not respond to remote loopback requests. (8089)
- The `ifInOctets` and `ifOutOctets` counters for an interface of `atmIma` type include the protocol overhead of the IMA group. For an accurate count of data cells for an IMA group, use the `ifInOctets` and `ifOutOctets` counters for the `aa15` interface type, which is stacked above the `atmIma` interface.

## Contacting Customer Support

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For assistance or more information, contact your local technical support representative.

