

DANS-RSMS-011

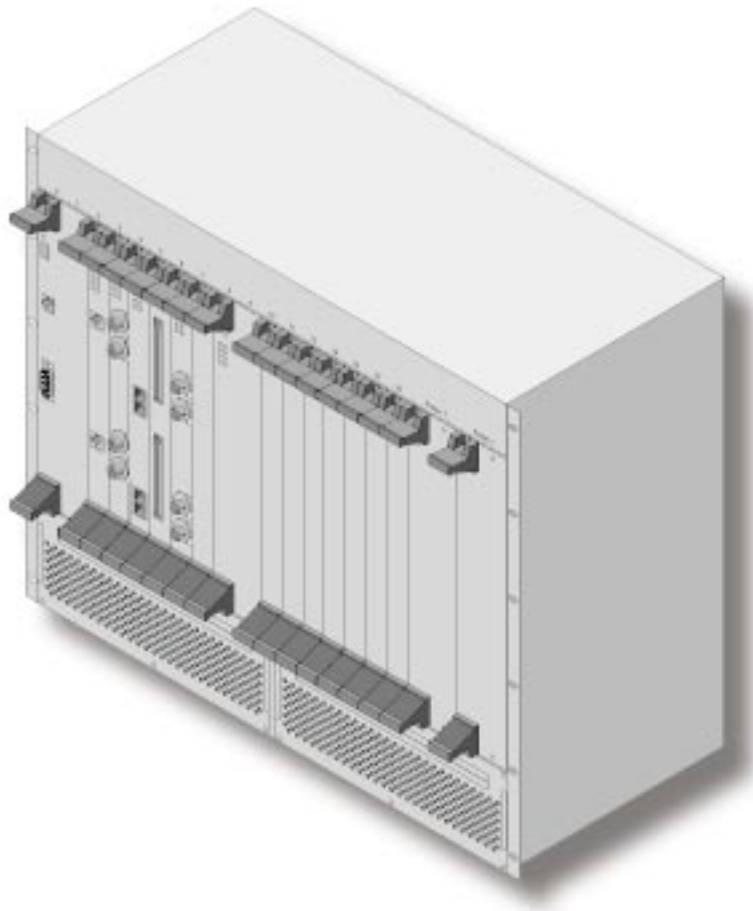
Data Access Network Solutions (DANS)

RedBack

SMS 1000

Troubleshooting Guide

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About this document

This document provides guidelines for troubleshooting a RedBack SMS 1000 running AOS Release 2.2. In general, this document provides high-level troubleshooting information with pointers to where more detailed information can be located.

Audience

The intended audience of this document is the Nortel Networks DANS (Data Access Network Solutions) design and support community (for example, TAS and GTS) who are assumed to be:

- IP literate with an understanding of bridging, routing, and subnet masking
- familiar with common networking concepts such as WANs, serial links, Frame Relay, and ATM

Organization

This document is organized as:

- Chapter 1 describes how to resolve problems within a RedBack SMS 1000
- Chapter 2 lists common configuration problems that have been encountered within a RedBack SMS 1000
- Chapter 3 describes the RedBack SMS 1000 hardware module indicators
- Chapter 4 provides information for identifying problems associated with RedBack SMS 1000 network elements

Related documents

For related documents, refer to:

- *DANS Redback SMS Documentation Guide*, DANS-RSMS-010
- *DANS IMMS Documentation Guide*, DANS-1MMS-010

Document version, issue, and status

The version and issue of Nortel Networks DANS documents are indicated by a four-digit number, for example, 01.01. The first two digits indicate the product version; the second two digits indicate the document issue. The digits increase by one for a new product release and when the document content is changed; for example, 02.03 indicates document issue 03 for product release 02. The status of documents is indicated by Draft and Final; Draft indicates the initial document issue for review by DANS; Final indicates that the document has been reviewed and approved by DANS on the indicated date.

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Troubleshooting a RedBack SMS 1000

This section describes how to resolve problems within a RedBack SMS 1000. In general, troubleshooting problems involves:

- Detecting that a problem exists
- Identifying the source of the problem
- Fixing the problem

Detecting that a problem exists

A problem is usually detected when:

- a system failure has occurred
- a log message indicates a problem
- an SMS module LED indicates a problem
- a user complaint is received
- another network element indicates a problem

Identifying the source of the problem

Consider the following when trying to identify the source of the problem:

- What has changed?
- Do you need to use troubleshooting commands?
- Is the problem a common one for which a resolution is already known?
- Has a problem been indicated in a log message?
- Could it be a RedBack SMS module problem?
- Could it be related to RedBack SMS connections or cables?
- Could it be a RedBack SMS configuration problem?
- Could it be an external hardware or software problem?

For specific network elements, see “Questions to ask first” on page 4-1.

Using troubleshooting commands

It may be necessary to use CLI (command line interface) commands to help determine the source of the problem. The following CLI commands are particularly useful: **ping**, **show**, **tracert**, and **debug**. To use each of these commands, refer to the *RedBack AOS Command Reference Guide*. Also refer to “Troubleshooting command summary” on page 4-5.

CLI commands are entered through a console attached to the RS-232 serial port on a CE module or through a Telnet session routed to the Ethernet port on a CE module.

The CLI is comprised of a number of modes which specify an environment where a group of related commands are valid. When initiating a session, by default the CLI is always set to the operator (non-privileged) mode. In the operator mode, the system can not be modified. In order to configure the system, the administrator (privileged) mode must be entered; the operator **enable** command is used to do this; for example, enter **enable** after the Redback operator system prompt:

```
[local] Redback> enable
[local] Redback#
```

Once within the administrator mode, all system commands are available. To return to the operator mode, enter **no enable** after the system prompt. All other modes are sub-modes of the configuration mode (see Figure 1-1). To exit the configuration mode, enter the **end** command. To return to the a higher level configuration sub-mode or close an active session, use the **exit** command.

Note: Until valid administrator user names and passwords are configured, the administrator mode can only be accessed from the console attached to the RS-232 port on the CE module.

Configuring an administrator account

The following example, creates an administrator account with the user name of “root” and a password of “foobar” is assigned to the account.

```
[local]Redback(config)#context local
[local]Redback(config-ctx)#administrator root password foobar
```

The next time a session is initiated via Telnet or the console, the system will prompt for a user name and password. The user must enter “root@local” and “foobar” at the appropriate prompts in order to gain access.

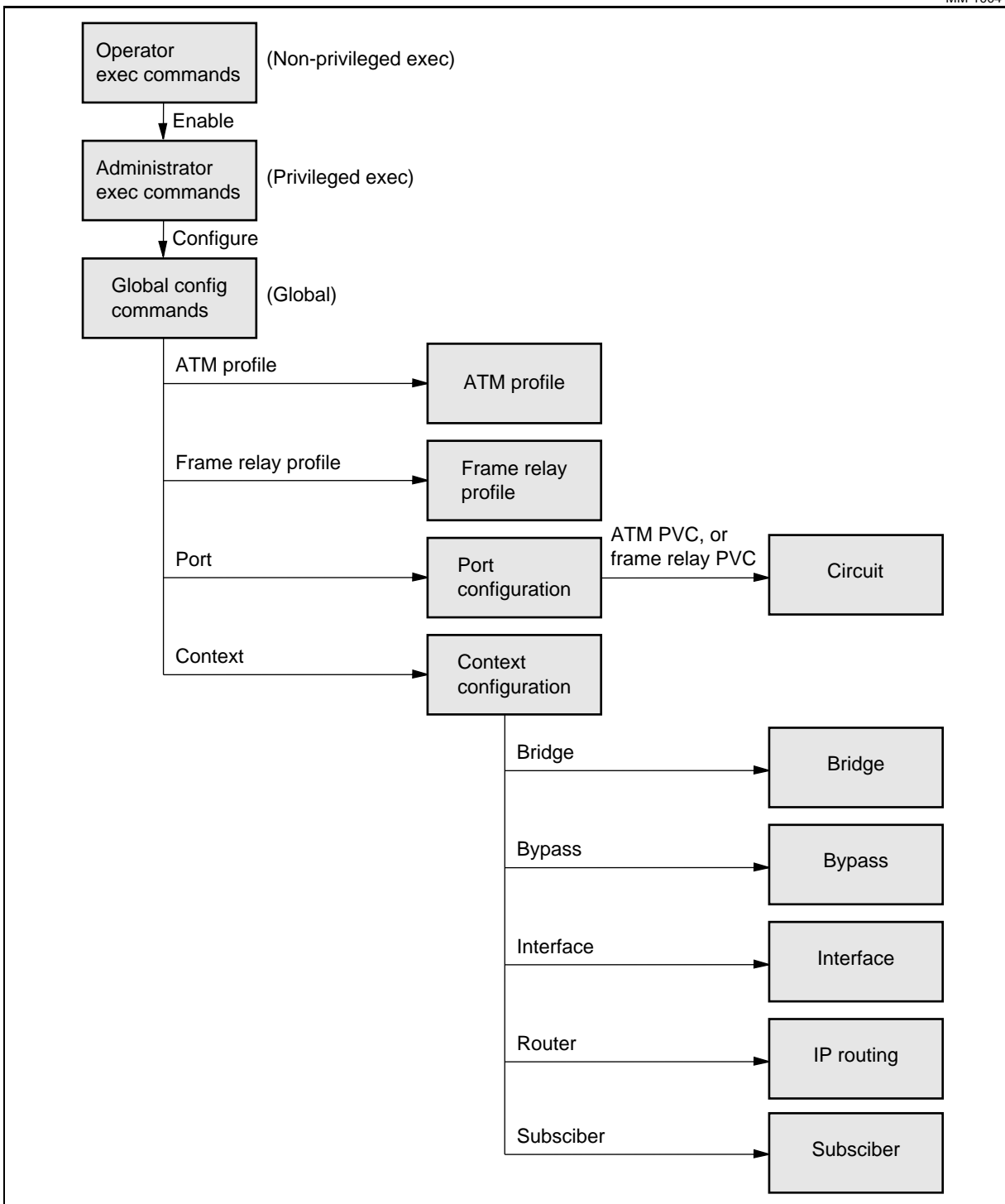
Configuring the Ethernet port on the CE module

Before a Telnet session can be initiated, the Ethernet port on the CE module must be configured as follows:

```
[local]Redback(config)#port ethernet 0/0
```

Figure 1-1
CLI modes

MM-10041



Common startup problems

Check that the correct software has been loaded. By default, the system boots using the *redback.bin* and *redback.cfg* files. These files are stored on the CE FLASH memory. The loaded files may not be the correct ones. The CE FLASH memory can store multiple system images and configurations. Determine which system images and configurations are available (use the **show version** command) and load the correct ones.

- The default system image is called *redback.bin* and it can be replaced with a file with a different name. A new system image can be copied to the CE FLASH memory from a PCMCIA card or a TFTP server using the command [local]Redback#**copy tftp:<IP_address>/tftpboot/redback.bin/flash/<filename>.bin**
- Use [local] Redback#**dir /flash** command to view the contents of the CE FLASH memory
- Use [local] Redback#**show configuration /flash/<filename>.cfg** command to view the contents of a configuration file and [local] Redback#**configure /flash/<filename>.cfg** command to load it
- The RedBack SMS can be booted over a network connection using BOOTP/TFTP to transfer the system image directly to RedBack SMS DRAM memory. The default system boot must be interrupted by pressing any key and changing the boot device from **flash** to **dc** and the boot flags to **0xC0**. You must then specify a filename and host to boot from

Note: The default system image and configuration files can be replaced by files with different names provided they are loaded as indicated above.

For a list of common configuration problems, their causes, and recommended resolution actions, see “Common configuration problems” on page 2-1. Review the list of common problems to see if the current problem is listed. Also refer to “Network element problems” on page 4-1.

Problem indicated in a log message

Analyze the log message and locate the source of the problem. Log messages are automatically kept in a circular buffer in the CE module FLASH memory. Use the **show log** command to display its contents. You can also use the **log checkpoint** command to move the entire contents of the log buffer to an inactive buffer. You can also save log messages to a file within FLASH memory using the **save log** command.

By default, log messages are not displayed in real time on the console or Telnet terminal. To display log messages in real time, use the **logging console** configuration command or the Telnet **terminal monitor** command.

All log messages contain a numeric value indicating the severity of the event or condition that caused the message, see Table 1-1.

Table 1-1
Log messages

Severity level	Log type	Meaning
0	emergency	Panic condition (the system is unusable)
1	alert	Immediate administrator intervention is required
2	critical	Critical conditions have been detected
3	error	An error condition has occurred
4	warning	A potential problem exists
5	notification	Normal, but significant events or conditions exist
6	informational	Informational message; no problem exists
7	debugging	Output from an enabled system debugging function

RedBack SMS module problem

Each RedBack SMS module has LED indicators. These LEDs assist the user in diagnosing possible problems with the interface associated with each module. There is a “Power” LED indicating that the module is seated in the chassis and powered properly. A “Status” LED goes on after the proper software is loaded, the system recognizes the module, self-test diagnostics for the module are completed, and the software drivers have been created for the module. Look at the LEDs for each module and refer to their interpretation within “Hardware module indicators” on page 3-1. You can also use the **show diagnostics** command to detect SMS module problems.

Connection or cable problem

Many problems can be traced back to bad cable or incorrect connections. Check all connections related to any suspect equipment; especially those of recent equipment additions. Also refer to “Subscriber fails to connect” on page 2-4.

Configuration problems

Use CLI configuration commands to check the configuration of suspect system elements. For a list of the available configuration commands, refer to the *RedBack AOS Configuration Guide*. Also refer to “Common configuration problems” on page 2-1 and “Configuration file-related problems” on page 4-7.

External equipment problems

If you suspect or know that the problem is related to external equipment (for example, a FID or router) refer to the troubleshooting section within the appropriate equipment documentation. Also refer to “Questions to ask first” on page 4-1.

Fixing the problem

Fixing a problem usually involves one of the following actions:

- referring to the common problem list and fixing the problem
- verifying correct connections and cables
- replacing software, modules, or equipment
- checking and correcting the system configuration
- referring to the appropriate external equipment documentation

Common configuration problems

This section lists common configuration problems that have been encountered within a RedBack SMS 1000. The problem is stated, followed by one or more possible causes for the problem. The common problems encountered include:

- Telnet login fails
- Routing problems
- Ethernet port is unreachable
- System fails to boot
- IP interface is unreachable
- Subscriber fails to connect
- CHAP fails to authenticate a PPP subscriber
- ATM problems
- Debugging is turned on but no messages are displayed
- Ping and traceroute can't reach a previously reachable destination
- LAC (L2TP Access Concentrator) problems

For detailed configuration information, refer to the *RedBack SMS Configuration Guide*. Also refer to “Configuration file-related problems” on page 4-7.

Telnet login fails

- If the RedBack SMS fails to return a “Username:” prompt, verify that at least one administrator account has been configured.
- Be certain the user name being supplied to the Telnet prompt is of the form *user@context* (for example, “malcolm@local”).
- Check to see whether the RedBack SMS is configured to authenticate administrative accounts using the local configuration or RADIUS. Verify that the proper user name and password information is stored in either the local configuration or the RADIUS database.
- The show configuration command is only available to administrators that have authenticated to the local context. Verify that you logged in to your Telnet session as *user@local*, as opposed to *user@some-other-context*.
- In addition, **show configuration** is an administrator command and is not available to operators. Enter the **enable** command and supply an administrator password when prompted to do so in order to change to administrator mode.

Routing problems

- The RedBack SMS lists only those directly attached subnets associated with interfaces that are currently up. Use the **show ip interface** command to determine if all of the interfaces on the RedBack SMS are up.
- The RedBack SMS will not list any downstream PPP routes until the appropriate PPP link is up. Use the **show subscribers** command to verify that the route in question is associated with a PPP link that is currently up.
- Verify that the neighbor router is connected to the RedBack SMS through an interface that is configured to supply routing updates.
- Verify that the routing protocol and version being used by the RedBack SMS on the appropriate interface and the neighbor router are the same.

Dynamic routing

- Check to see if there is a **redistribute static** command configured on the RedBack SMS.
- Check to see if there is a **redistribute subscriber** command configured on the RedBack SMS.
- Check to see whether a **network** command has been configured in the RedBack SMS and that the address of the appropriate interface has the same network-prefix as a network number specified in a **network** command for the relevant context.

Ethernet port is unreachable

- Use the **show port info** command to determine which ports are being used.
- If the port is attached to a hub, a “straight through” cable is required. If the port is attached directly to an end station such as a router, a “cross over” cable is required.
- Check to see that the right cable type is being used.
- The port may be administratively shut down. Use the **no shutdown** port sub-mode command to enable the port.
- Verify bindings.
- Ethernet port 0/0 can only be used for out-of-band management.

System fails to boot

- Check to see that there is a file named “redback.bin” in CE FLASH memory and the system is set to boot from CE FLASH memory.
- Determine whether the system is attempting to boot from the network or from the CE FLASH file system. Select the appropriate option. If loading from the network, verify the operation of the BOOTP/TFTP server and the presence of the file to be loaded.
- Make sure the management Ethernet port (Ethernet 0/0) is properly cabled to the network. This port is the only port on the system capable of network loading the RedBack SMS image.
- Check to see if the system displays a valid IP address and subnet mask on the console during the boot process. If not, the BOOTP server may not be properly configured.
- If the system is displaying valid addressing information, check to see if the image transfer is failing. If so, verify the file name, the TFTP server configuration, and that the file is not read-protected.
- Verify that the boot device has been set to “dc” and that the boot flags have been set to 0xc0.
- The system will automatically load a configuration file named “redback.cfg.” Use the **directory** command to verify that this file exists.

IP interface is unreachable

- Verify the interface has a properly configured IP address and subnet mask.
- Check to see that the interface has at least one Ethernet port, ATM circuit, or Frame Relay circuit bound to it. An interface will always be in the down state if there are no static binds or active dynamic binds to it.
- Verify that at least one Ethernet port, ATM PVC, or Frame Relay PVC that is bound to the interface is up. For example, if only one Ethernet port is currently bound to the interface and that port is operationally or administratively down, the interface will also be down.
- If IP over ATM, ensure that a destination has been defined using **show ip host** command.
- ARP is disabled by default on all interfaces in the RedBack SMS. Verify that the `ip arp` command appears in the profile of the interface to which the Ethernet port is bound.
- After changing an IP address all communications no longer work. When the IP address is removed from an interface profile, all the bind commands that reference that interface are automatically and immediately deleted from the configuration. Re-enter the appropriate bind commands to restore communications.

Note: A quick way to restore the bindings is to use the **configure <url>** command to reload the configuration file.

Subscriber fails to connect

Are error messages being received? If they are not check the port status, circuit information and bindings. If they are:

- If authentication is being done remotely through RADIUS, then check the following:
 - Verify using the **ping** command that the RADIUS server is IP reachable from the RedBack SMS in the appropriate context.
 - Verify that the subscriber record in the RADIUS database has the correct information.
 - Make sure that the user-name string being supplied by the remote PPP equipment is of the form *user@context* (for example, “malcolm@isp.net”).
 - When configuring a radius server on the RedBack SMS, “oldports” option might be necessary if you are using a radius server that uses old UDP ports (1645 & 1646), instead of the new ones (1812 & 1813).
 - When configuring a radius server on the RedBack SMS, make sure that the ‘key’ on the RedBack SMS matches the one configured on the RADIUS server.

- If authentication is being done locally through subscriber records, then check the following:
 - Verify that the subscriber record in the RedBack SMS configuration is accurate.
 - Make sure that the user-name string being supplied by the remote PPP equipment is of the form *user@context* (for example, “malcolm@isp.net”).
- Check to see that a compatible authentication protocol is being used by each end of the link; for example, if the remote equipment supports PAP only and the RedBack SMS is configured for CHAP only, the link will not come up.

Is a password verification message being received? If so:

- A subscriber might fail to bind because the subscriber’s IP address does not fall within the range of addresses assigned to an interface (in the context to which the subscriber is to be bound).
- A subscriber might fail to bind because the subscriber’s IP address is a duplicate of another subscriber’s IP address that is already bound in.
- A subscriber might fail to bind because the subscriber is not using the correct context to log on.
- If a change is made to the interface IP address or netmask, it may affect subscriber bindings. Use the ‘Clear subscriber’ command to reestablish the binding.
- A subscriber might fail to bind because the DHCP server refuses to disseminate IP addresses to the subscriber beyond the number allocated for that subscriber.
 - This will only be enforced if the Redback SMS is configured with the ‘DHCP RELAY OPTION’ and the DHCP server is utilizing that option.
- Subscriber binds successfully (that is, authenticated and authorized) but can not receive data:
 - Is there a ‘BRIDGE-ONLY’ command in the interface? (BRIDGE-ONLY turns off all IP routing).
 - Is there a BYPASS redirecting traffic to an unexpected destination?
 - Is the ‘ip route’ for the next hop configured correctly (‘ip route is needed if your next hop is on a different sub-net then you current one).

CHAP fails to authenticate a PPP subscriber

- Check to see that the remote PPP equipment supports and is configured to run CHAP.
- Verify that the ATM or Frame Relay PVC is bound using the **bind authentication** command and that CHAP is included in the keywords.
- Verify that the remote PPP equipment is supplying a user name string of the form *user@context* and that the portion of the string to the left of the “@” sign appears in the RADIUS server being used by the appropriate context.
- Verify that the RedBack SMS has been configured to supply an outbound password and that this password matches that expected by the remote PPP equipment.
- Verify that the remote PPP equipment is expecting an authentication user name-string equivalent to the RedBack SMS host name.
- Check to be sure the RedBack SMS has been either configured for local authentication and the appropriate subscriber profile exists in the appropriate context, or that the RedBack SMS has been configured for remote RADIUS authentication and the server is reachable and working.

ATM problems

High percentage of packet loss on an ATM PVC

- Erratic packet loss is often a sign of improper traffic shaping settings. Attempt the following experiment. Ping a remote host connected to the ATM PVC in question from the RedBack SMS. Ping the host again using 1500 byte packets. If the small packet pings are more often successful than the large packet pings, the traffic shaping parameters are likely incorrect and cell loss is affecting reliable packet transmission.

RedBack SMS can send but can't receive data

- Verify that the VPI and VCI values are properly configured for the PVCs on the port.
- If the port is connected to a transit ATM switch (or switches), verify that a transit VCC has been provisioned across the switch (or switches).
- Check to see that all physical-layer parameters are configured appropriately for the port in question. Possible physical parameters to examine include cell delineation, scrambling, idle cells, and clock source.
- Determine whether the switch connected to the port in question is configured for “policing” (UPC/NPC). If so, verify the shaping parameters contained in the ATM profile for all of the PVCs on the port in question will not be dropped by the switch.

Cells not being received by a properly connected ATM DS-3 port

- If there are no alarms and cells are being sent but not received, most likely there is a configuration problem for a port physical-layer parameter. Check the configuration of the **scramble**, **cell-delineation**, and **clock source** port commands.
- Check that the encapsulation is the same at both ends of the link.

Debugging is turned on but no messages are displayed

- If log messages are not displayed in real time on the console, enter the **logging console** global configuration command.
- If log messages are not displayed in real time through a Telnet session, enter the **terminal monitor** exec command.

Ping and traceroute can't reach a previously reachable destination

- Verify the current context by examining the system prompt—the current context name appears within square brackets at the left side of the prompt. The **ping**, **traceroute**, and **show** administrator and operator commands are all specific to the context in which they are executed.
- Switch to the context in which the **ping** or **traceroute** command was previously successful by entering the **context** command within administrator (privileged exec) mode. Then attempt the **ping** or **traceroute** command again.
- The **ping**, **traceroute**, and **show** administrator and operator commands are all specific to the context in which they are executed. Verify the current context by examining the system prompt—the current context name appears within square brackets at the left side of the prompt.
- Switch to the context which is configured with interfaces providing IP reachability to the workstation in question by entering the **context** command within administrator (privileged exec) mode. Then attempt to **ping** the workstation again.
- Also see “Routing problems” on page 2-2, “Ethernet port is unreachable” on page 2-3, and “IP interface is unreachable” on page 2-4.

LAC (L2TP Access Concentrator) problems

- In the context where a tunnel is initiated, ensure that the following context sub-mode commands have been issued by the system administrator:
 - **aaa authentication subscriber none** to disable authentication of subscribers; AOS will only recognize the default subscriber profile
 - **subscriber default** to create a subscriber profile to be used by all subscribers
 - **domain** to configure a context domain-name alias for each tunnel
 - **l2tp-peer name** and verify that the specified L2TP-tunnel peer name and the UDP/IP remote and local IP addresses exist, and that the L2TP-tunnel peer name corresponds to the LNS (L2TP Network Server) hostname or the tunnel's local name
- Check that the **l2tp-tunnel domain** subscriber sub-mode command has been issued; this command is required to map a subscriber PPP session to an L2TP tunnel with the same name as the subscriber's domain name.
- Always verify spelling, a RedBack SMS 1000 is case sensitive.
- The password set using the **tunnel auth** L2TP sub-mode command on the LAC (L2TP Access Concentrator) must match the tunnel password on the LNS (L2TP Network Server).
- Check IP connectivity by pinging both the remote and local interfaces. If this fails confirm the remote IP address, check bindings and port status.

Hardware module indicators

This section describes the RedBack SMS 1000 hardware module indicators. The available hardware modules include:

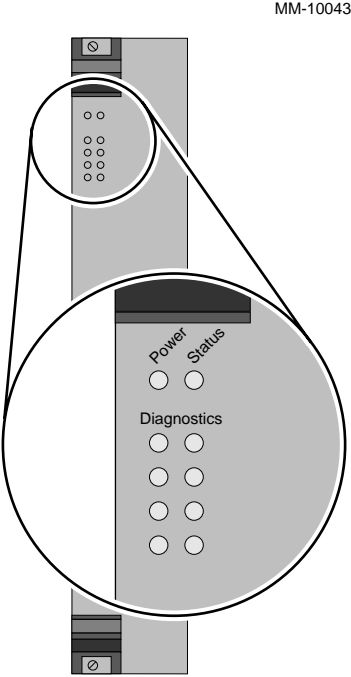
- Forwarding Engine (FE) module
- Control Engine (CE) module
- 2-port ATM OC-3c MMF module
- 2-port ATM OC-3c SMF module
- 2-port ATM DS3 module
- 2-port 10/100 Ethernet module
- 2-port Frame Relay DS3 module
- 2-port Frame Relay HSSI module

For more information on each module, refer to the *RedBack SMS 1000 Hardware Guide*.

Forwarding Engine (FE) module

Table 3-1 indicates the function, state and meaning for each module LED.

Table 3-1
Forwarding Engine (FE) module

Faceplate LED locations	LED function	Color status	Meaning
	Power	Green	The module is properly seated and is receiving input power.
		Off	The module is either not fully inserted or is not receiving input power.
	Status	Green	The module has passed its self diagnostics and has been brought into service. Under some circumstances this LED may blink. This occurs when the FE appears to be operational but has not yet been brought into service.
		Off	The module has failed diagnostics, is not properly recognized by the system, or is installed in the wrong slot.
	Diagnostics	Green	If all the diagnostic LEDs are on steadily, the FE has not yet had code downloaded to it by the CE and or has not yet been initialized.
		Counting	A binary “counting” pattern indicates that the FE has been initialized and enabled and is operational. Any other pattern (such as all left LEDs are on or all right LEDs are on) indicate failed conditions and should be reported to RedBack Customer Support personnel.

Control Engine (CE) module

Table 3-2 indicates the state and meaning for each module LED.

Table 3-2
Control Engine (CE) module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10044</p>	Power	Green	The module is properly seated and is receiving input power.
		Off	The module is either not fully inserted or is not receiving input power.
	Status	Green	The module has passed its self diagnostics and is in service. Under some circumstances this LED may blink. This occurs when the CE1 appears to be operational but has not yet been brought into service.
		Off	The module has failed diagnostics or is installed in the wrong slot.
	100 M	Red	The Ethernet management port is connected at 100 Mbps
		Green	The Ethernet management port is either disconnected or connected at 10 Mbps
	Diagnostics	-	This LED is reserved for future use.

2-port ATM OC-3c MMF module

Table 3-3 indicates the state and meaning for each module LED.

Table 3-3
2-port ATM OC-3c MMF module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10045</p>	Power	Green	Module is properly seated and receiving input power.
		Off	Module is not properly seated or is not receiving power.
	Status	Green	Module has passed self test diagnostics on both ports and has been initialized by the system.
		Off	Module has failed diagnostics.
	Link	Green	Signal is present and within specifications.
		Flashing	Signal is present and within specifications. Receiving/transmitting packets, not idle cells.
		Off	No signal present or not within specifications.
	Loc	Yellow	Local port is in alarm state, for example LOF, LCD, AIS.
		Off	Normal.
	Rem	Yellow	Remote end cannot obtain sync or has a defect or failure; for example FERF.
		Off	Normal.

2-port ATM OC-3c SMF module

Table 3-4 indicates the state and meaning for each module LED.

Table 3-4
2-port ATM OC-3c SMF module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10045</p>	Power	Green	Module is properly seated and receiving input power.
		Off	Module is not properly seated or is not receiving power.
	Status	Green	Module has passed self test diagnostics on both ports and has been initialized by the system.
		Off	Module has failed diagnostics.
	Link	Green	Signal is present and within specifications.
		Flashing	Signal is present and within specifications. Receiving/transmitting packets, not idle cells.
		Off	No signal present or not within specifications.
	Loc	Yellow	Local port is in alarm state, for example LOF, LCD, AIS.
		Off	Normal.
	Rem	Yellow	Remote end cannot obtain sync or has a defect or failure; for example FERF.
		Off	Normal.

2-port ATM DS3 module

Table 3-5 indicates the state and meaning for each module LED.

Table 3-5
2-port ATM DS3 module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10046</p> <p>Power Status</p> <p>Port ① Link ① Loc ① Rem</p> <p>TX RX } Port 0</p> <p>TX RX } Port 1</p>	Power	Green	Module is properly seated and receiving input power.
		Off	Module is not properly seated or is not receiving power.
	Status	Green	Module has passed self test diagnostics on both ports and has been initialized by the system.
		Off	Module has failed diagnostics.
	Link	Green	Signal is present and within specifications.
		Flashing	Signal is present and within specifications. Receiving/transmitting packets, not idle cells.
		Off	No signal present or not within specifications.
	Loc	Yellow	Local port is in alarm state, for example LOF, LCD, AIS.
		Off	Normal.
	Rem	Yellow	Remote end cannot obtain sync or has a defect or failure; for example FERF.
		Off	Normal.

2-port 10/100 Ethernet module

Table 3-6 indicates the state and meaning for each module LED.

Table 3-6
2-port 10/100 Ethernet module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10047</p>	Power	Green	Module is properly seated and receiving input power.
		Off	Module is not properly seated or is not receiving power.
	Status	Green	Module has passed self test diagnostics on both ports and has been initialized by the system.
		Off	Module has failed diagnostics.
	Link	Green	Carrier detected by the port.
		Off	No Carrier has been detected by the port.
	100 M	Green	Port is operating at 100 Mbps.
		Off	Port is operating at 10 Mbps.
	RX	Green	~1 mS persisted blink for each frame received by the port.
		Off	No Activity.
	TX	Green	~1 mS persisted blink for each frame transmitted by the port.
		Off	No Activity.

2-port Frame Relay DS3 module

Table 3-7 indicates the state and meaning for each module LED.

Table 3-7
2-port Frame Relay DS3 module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10048</p>	Power	Green	Module is properly seated and receiving input power.
		Off	Module is not properly seated or is not receiving power.
	Status	Green	Module has passed self test diagnostics on both ports and has been initialized by the system.
		Off	Module has failed diagnostics.
	Link	Green	Signal is present and within specifications.
		Flashing	Signal is present and within specifications. Receiving packets.
		Off	No signal present or not within specifications.
	Loc	Yellow	Local alarm indicator. Normal, no alarms.
		Off	Local port is in an alarm state (for example, LOF, LCD, AIS).
	Rem	Yellow	Remote alarm indicator. Far end cannot obtain sync or has a far end defect/failure (for example, FERF).
		Off	Normal, no alarms.

2-port Frame Relay HSSI module

Table 3-8 indicates the state and meaning for each module LED.

Table 3-8
2-port Frame Relay HSSI module

Faceplate LED locations	LED function	Color status	Meaning
<p>MM-10049</p> <p>Power Status</p> <p>Port ① Link ① Loop</p> <p>Port 0</p> <p>Port 1</p>	Power	Green	Module is properly seated and receiving input power.
		Off	Module is not properly seated or is not receiving power.
	Status	Green	Module has passed self test diagnostics on both ports and has been initialized by the system.
		Off	Module has failed diagnostics.
	Link	Green	Signal is present and within specifications.
		Flashing	Signal is present and within specifications. Receiving packets.
		Off	No signal present or not within specifications.
	Loop	Yellow	Local port is in loopback.
		Off	Non-loopback.

Network element problems

This section provides information of identifying problems associated with RedBack SMS 1000 network elements. It includes:

- Questions to ask first
- Top problem summary
- General questions
- Troubleshooting command summary
- Configuration file-related problems
- Frame Relay problems
- Management Information Base (MIB) problems

Questions to ask first

Questions to ask first when trying to identify the source of a problem:

- Top question to ask
- 10 top questions to ask if there is a network problem
- 10 top questions to ask if there is an Ethernet hub problem
- 10 top questions to ask if there is an Ethernet switch problem
- 10 top questions to ask if there is a router problem

Top question to ask

What has changed?

10 top questions to ask if there is a network problem

1. What is the network topology and address plan?
2. What is the software lineup?
3. What is working in the network?
4. What is not working in the network? Has it ever worked?
5. What has changed?
6. Can you isolate the problem to a particular network element?
7. Are all network elements configured correctly?

8. Is the problem an intermittent one or a failure?
9. Can the problem be reproduced?
10. Is the problem load related?

10 top questions to ask if there is an Ethernet hub problem

1. If it was working, what has changed?
2. Are there any link lights on the equipment or hub ports?
3. If there are no link lights, are the Ethernet cables straight through?
4. If there are link lights, is there any activity?
5. Which ports work to which ports?
6. What is the length of the Ethernet cables?
7. Are the speeds of the equipment and hub ports the same?
8. Has the hub been segmented?
9. If hubs are daisy chained, is there a crossover connection?
10. Ask question 1 again.

10 top questions to ask if there is an Ethernet switch problem

1. Ask the hub questions, see “10 top questions to ask if there is an Ethernet hub problem” on page 4-2.
2. What are the rules for membership in VLAN's?
3. Are the rules defined and used correctly?
4. Is there activity/errors by viewing stats on the Ethernet and uplink ports?
5. What are the entries in the CAM table and are they correct?
6. What is the forwarding table and associated ports?
7. Is spanning tree enabled and is it working correctly?
8. Is there a way of monitoring data on ports?
9. For uplink ports, are they configured correctly?
10. What has changed?

10 top questions to ask if there is a router problem

1. What has changed?
2. Is the software load correct?
3. Are all the interfaces configured and working properly?
4. Is there activity/errors by viewing stats on Ethernet and uplink ports?
5. Can you ping each neighbor?
6. Is the ARP table updated correctly?
7. Are traceroute entries in each direction correct?
8. Is the routing table updated correctly?

9. Can you ping each of the required remote locations?
10. Are there any access lists (AOL)?

Top problem summary

- Physical problems
 - cable faults
 - defective hardware
 - network design errors
- Software problems
 - wrong release of software
 - incompatible protocols
 - improper configuration of switches, routers, bridges
 - incorrect framing, encapsulation, scrambling
- Addressing problems
 - incorrect addresses
 - duplicate node addresses
 - incorrect subnet masks
 - broadcast storms
 - private versus public addresses
- Routing problems
 - routing loops
 - no routing updates
 - no default route, if required
 - not using best link

General questions

Answers to the following general questions are presented:

- How many Telnet sessions can a RedBack SMS handle?
- How can I tell who's logging into the RedBack SMS?
- What does show command information mean?

How many Telnet sessions can a RedBack SMS handle?

Currently, a maximum of 4 Telnet sessions per RedBack SMS node are supported. These can be in any context. There can be 5 CLI sessions total: 4 Telnet + 1 console.

How can I tell who's logging into the RedBack SMS?

Without a distinct userid for each of the managers you will be unable to get a true name, but you can tell the source ip address of the Telnet by issuing a `sh ip socket` command. Table 4-1 gives an example of the output.

Table 4-1
Active Internet connections (including servers)

PCB	Proto	Recv-Q	Send-Q	Local Address	Foreign Address	(state)
1e170b0	TCP	0	0	10.1.1.21.23	10.1.1.22.3585	Established
1e171b0	TCP	0	0	0.0.0.0.23	0.0.0.0.0	Listen
1e17230	UDP	0	0	0.0.0.0.1812	0.0.0.0.0	

Table 4-1 shows that the port is added as the 5th octet. In this case the source of the Telnet session is 10.1.1.22.

What does show command information mean?

Several show commands produce information about circuits. What does the information mean and can it be used to trace back to a interface or subscriber?

- ATM and Frame Relay connections

The first 8 bits are for slot and port information:

- slot -- 5 bits
- port -- 3 bits

- Frame Relay connections

The remaining 24 bits are the DLCI.

Thus the circuit value of 0x30000037 would be slot 6, port 0, and DLCI of 55.

- ATM connections

The remaining bits are comprised of the VPI and VCI. It breaks down as follows:

- VPI -- 8 bits
- VCI -- 16 bits

Thus a circuit value of 0x30040037 would be slot 6, port 0, VPI of 4 and VCI of 55 (0x37). From here you can look to the configuration to find who is bound to that port.

Troubleshooting command summary

Use the following commands to troubleshoot problems associated with the indicated network element. For detailed command descriptions, syntax, use, and examples, refer to the *RedBack AOS Command Reference Guide*.

RedBack SMS node

- Show log inactive
- Show stack
- Show hardware
- Show diag all
- Show config

Connectivity (context sensitive)

- Ping
- Traceroute

Hardware (Port/ Slot)

- Show diag
- Show port diag
- Show hardware
- Show port info
- Show port table
- Show slot table
- Show port counters
- Debug port
- Debug slot

Frame Relay

- Show frame-relay lmi-config (lmi must be up before troubleshooting)
- Show frame-relay counters
- Show frame-relay lmi-errors
- Show frame-relay lmi-statistics
- Show frame-relay profile
- Show frame-relay pvc
- Show frame-relay lmi
- Show frame-relay packets (non lmi-packets)

IP (context sensitive)

- Show ip arp
- Show ip host
- Show ip secured-arp
- Show ip interface
- Show ip route
- Show ip static-route
- Show ip socket
- Show ip traffic
- Show ip icmp
- Debug ip route
- Debug ip interface

BYPASS/BRIDGE

- Show bridge info
- Show bridge table
- Show bridge span-tree
- Debug bridge table
- Debug bridge span-tree
- Show bypass

ATM

- Show atm pvc
- Show atm profile
- Show atm counters

PPP

- Show PPP
- Debug PPP

RADIUS/DHCP

- Show subscriber
- Debug aaa
- Debug radius
- Debug dhcp packets

Clear commands

- Clear subscriber
- Clear counters
- Clear ip counter
- Clear arp-cache

L2TP commands

- debug l2tp
 - all
 - window
 - tun-state
 - ses-state
 - tun-setup
 - ses-setup
 - aaa
 - packets
 - filte
- show l2tp counters
- show l2tp info

Configuration file-related problems

- Ports shutdown
- Use the 'IP Route' command to specify a destination that has no information present dynamically through protocols. Use this command if the destination that needs to be reached is on a different subnet.
- Use the 'radius strip-domain' command to strip the @context from the login id and just send the username to the RADIUS server.
- Use the 'ip host' for a circuit when using Route1483 RFC, since no ARP is done using this protocol.
- Packets could be dropped if they exceed the configured policing rate (for receiving) or the rate-limiting rate (for transmitting).
- If the RADIUS server sends a special value in the FRAMED-IP-ADDRESS attribute which informs the RedBack SMS device to assign the subscriber an IP address, the RedBack SMS MUST have a pool maintained locally for IP addresses.
- If ACLs (access control list) are used, note if each ACL has an implicit "deny all else" statement which causes packets that do not match any in the filter statement to be dropped.

- Port configuration parameters could cause cells to drop (clock-source, shutdown, cell-delination, scramble, length, loopback, framing).

Also refer to “Common configuration problems” on page 2-1.

Frame Relay problems

- Before doing any troubleshooting, make sure that LMI is up.
Enter the command "show frame-relay lmi-config". Make sure that the status of the LMI is up.
- Framing errors or basic connectivity problems
Only M13 framing as of 2.0.1.0 is supported. C-Bit may be supported later, but nothing is scheduled at this time.
- The frame-relay status is not staying up. It looks like the LMI is going up and down.
You've got clocking problems or LMI problems. Find out which system is providing the clocking and ensure it's on. Make sure that the LMI is of the same type (RedBack SMS defaults to the ANSI standard).

Management Information Base (MIB) problems

Nothing shows up in my SNMP view

1. First make sure SNMP is configured:
snmp server
snmp community SecretHandshake
2. By default only a very basic view is enabled, turn on the entire view:
snmp view InternetView internet included
snmp view SystemView system included

RedBack SMS supported MIBs

AOS includes support for SNMPv1, SNMPv2c and the following MIBs:

- AToM MIB (partial) [RFC 1695]
- EtherLike MIB [draft-ietf-hubmib-etherif-mib-02]
- Frame Relay DTEs MIB [RFC 2115]
- IP MIB [RFC 2011]
- IP forwarding MIB [RFC 2096]
- Interfaces MIB [RFC 2233]
- RMON (alarms and events groups) [RFC 1757]
- SNMPv2 MIB [RFC 1907]
- TCP MIB [RFC 2012]
- UDP MIB [RFC 2013]

Refer to the release notes for the version of AOS you are running for the most up-to-date list of supported MIBs.

MIB traps and events

- authenticationFailure, coldStart, linkDown, linkUp [RFC 1215]
- fallingAlarm, risingAlarm [RFC 1757]

Refer to the release notes for the version of AOS you are running for the most up-to-date list of supported traps.

Is there a hierarchy for MIBs?

Some systems require that the MIBs be loaded in an order so that the dependencies are all defined.

- RBN-SM1.my
- RBN-*-MIB.my
- RBN-*-CAP.my

Data Access Network Solutions (DANS)

RedBack

SMS 1000

Troubleshooting Guide

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