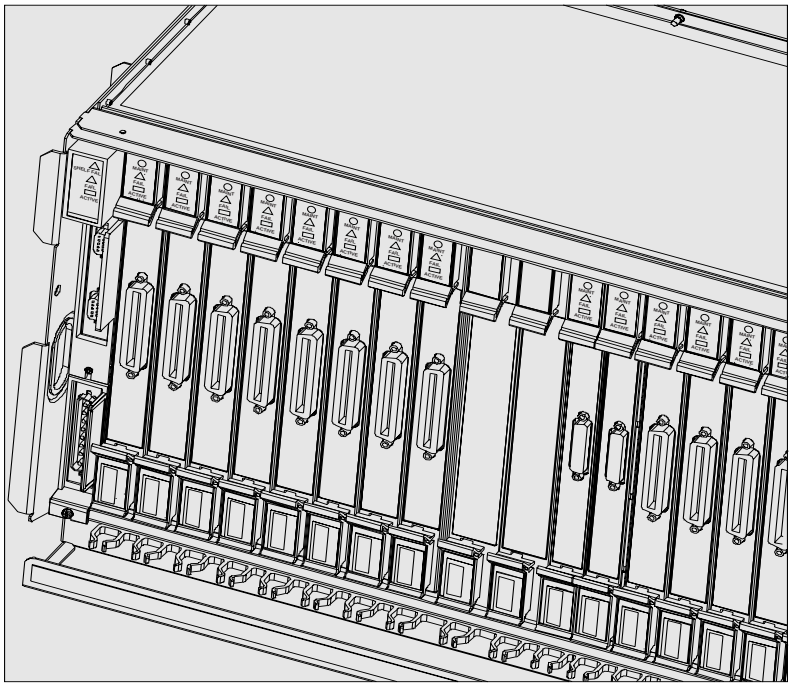
297-8391-501

DMS-100

Universal Edge 9000

Data Testing and Troubleshooting Guide

NA015 Standard 01.01 March 2001



NORTEL NETWORKS™

Front cover

DMS-100

Universal Edge 9000 DMS

Data Testing and Troubleshooting Guide

Title page

Document number: 297-8391-501
Document release: Standard 01.01
Date: March 2001

Publication history

March 2001

NA015 Standard 01.01 release of this document. Includes the following changes:

- removed SDSL and 1MM line cards from document, since they are not applicable to the UE 9000 DMS
- added DS3 ATM card information throughout document

August 2000

AN18 with AD3.0 Beta 1.1 release of the document. Includes the following changes:

- Added SDSL alarm descriptions and procedures.
- Made information and procedures in Chapters 1 and 2 generic by changing “ADSL” to “xDSL.”
- Added CPE troubleshooting information to Chapter 1.
- Added a procedure for troubleshooting slow data rate speeds to Chapter 1.
- Added information on DS3 ATM core cards throughout document, where appropriate
- Added information on 1-Meg Modem multi-circuit line cards throughout document, where appropriate
- Added information on SDSL multi-circuit line cards throughout document, where appropriate
- Added Procedure 2-8, “Upgrading the firmware”.

July 2000

AN18 Standard release of this document, Issue 1. This book was created from a restructuring of the *Universal Edge 9000 Data OAM&P User Guide*. Chapters 3, 5, 6, and 7 were removed from the previous version of the *Universal Edge 9000 Data OAM&P User Guide*, reorganized and updated for AN18, Issue 1 of this document.

Table of Contents

About this document

Audience

The intended audience for this document includes the following groups:

- maintenance technicians and experienced installers
- network administrators

Required reading

Before using this book, you should be familiar with the Release Notes for the Universal Edge 9000 element management system (uEMS). The Release Notes are provided on the uEMS software CD-ROM.

If you have limited experience with Hewlett Packard's™ HP OpenView™ Network Node Manager™ graphical user interface software, you should read Appendices A and B of the *UE9000 Data OAM&P User Guide* before using this guide.

How to use this guide

This guide is designed to be used after the following events have occurred:

- uEMS software is operational; that is, it has been installed and connected to the network
- The Universal Edge 9000 shelf has been installed; cables and power are connected

  Note: For more information on performing these prerequisites, see the *UE9000 Installation Quick Reference Guide* and the *UE9000 Data System Setup Guide*.

This guide should be used with the Hewlett Packard HP OpenView Network Node Manager documentation.

Additional documentation

The following additional documentation is available for the Universal Edge 9000 product:

- *UE9000 Pre-Installation Quick Reference Guide*
- *UE9000 Installation Quick Reference Guide*
- *UE9000 Adjacent Bay Installation Quick Reference Guide*
- *UE9000 Data Network Design Guidelines*
- *UE9000 Data System Setup Guide*
- *UE9000 Data OAM&P User Guide*
- *UE9000 Voice System Setup Quick Reference Guide*
- *UE9000 LED Quick Reference Guide*
- *UE9000 Voice OAM&P User Guide*

The following AccessNode documentation is referenced in this guide:

- *AccessNode Alarm and Trouble Clearing Procedures, 323-3001-543, in Volume 5A: Maintenance*

The following documentation is provided with the Universal Edge 9000 element management system (uEMS) software CD-ROM:

- *uEMS Release Notes*

Radio-frequency emissions notice

The following regulatory notice applies to Universal Edge 9000 equipment:

"This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be required to correct the interference at his own expense."

About the UE9000

The Universal Edge 9000 (UE9000) is a shelf on the AccessNode that provides voice and data services. The UE9000 supports the following circuit cards:

- DS1 IMA ATM (asynchronous transfer mode) core card
- DS3 ATM core card
- TDM card (time division multiplexing)
- SI card (system interface)
- Power I/O card
- Multi-circuit line card

AccessNode can support up to seven UE9000 shelves. Each UE9000 has a greater line density than traditional copper distribution shelves.

You provision and monitor data services independently from voice services using the UE9000 element management system (uEMS). The uEMS runs on an HP OpenView workstation and uses a graphical user interface. For information about the data network configuration, see the *UE9000 Data Network Design Guidelines*.

Troubleshooting

This chapter describes how to troubleshoot the Universal Edge 9000 (UE9000) data components.

Chapter contents

This chapter includes the following topics:

This chapter includes the following tasks:

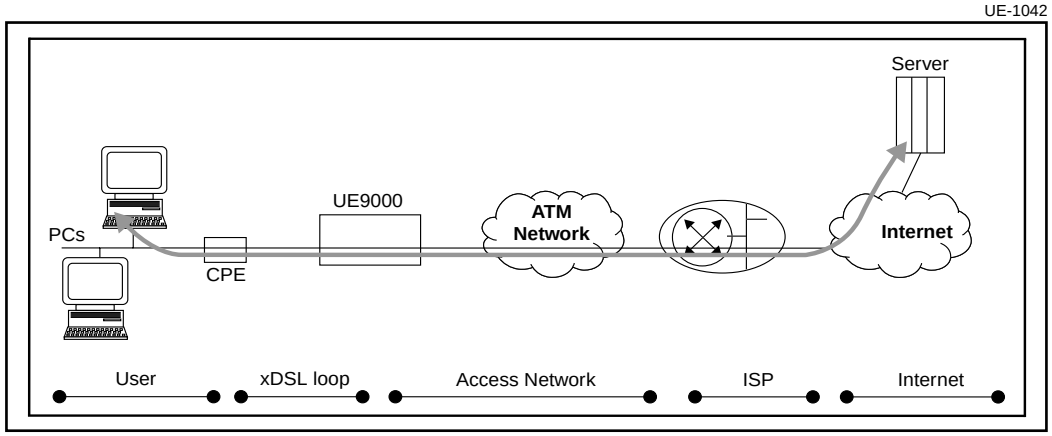
Task	See
Verify uEMS workstation has IP connectivity to the ATM core card	Procedure 1-7 on page 1-43
ATM core card is not sending traps to the uEMS workstation	Procedure 1-8 on page 1-46
No hardware flag for an xDSL line card	Procedure 1-9 on page 1-48
Troubleshooting an ATM core card	Procedure 1-10 on page 1-50
Synchronizing the alarm database	Procedure 1-11 on page 1-52
—end—	

Troubleshooting slow data transfer speeds

Troubleshooting slow data transfer rate problems can be difficult in a complex network, where many aspects of the end-to-end data path are not under the direct control of the person doing the troubleshooting. Unfortunately, this is the situation in a typical access service provider network.

Figure 1-1 shows the various portions of an end-to-end user data path, from the customer premises to a server on the internet.

Figure 1-1
Typical end-to-end user data path



Elements that can influence the data transfer rate occur in all locations within the network. In general they include processing speeds (PCs, network switching equipment, routers, servers), buffer sizes, protocol implementations, line speeds (access links, network trunks), delays (modulation/error correction, propagation, queuing, processing), error rates (transmission errors, packet discards due to congestion), and packet size.

TCP/IP protocol

Slow data transfer rates are most obvious during large file transfers, which generally use TCP/IP as the end-to-end protocol.

There are many implementations of the basic TCP/IP protocol, with different performance characteristics. In addition, there have been recent extensions to TCP/IP. These include: RFC1323, TCP Large Window, and RFC2018, TCP Selective Acknowledgment. All of these implementations include variable parameters that impact overall throughput. Changing parameters involves

trade-offs, so tuning these parameters to optimize throughput is not straight forward. Default values are provided that give acceptable performance in typical situations.

The major factors affecting TCP/IP throughput are line speed and round trip delay.

Line speed

In most situations, the user access line has the lowest data rate in the end-to-end data path and has the most affect. For ADSL lines, the upstream data rate is much lower than the down stream data rate. For file transfers from a remote server, this is not an issue, since the upstream (acknowledgment) packets are much smaller than the downstream packets, so the packet transmission time is small.

Round trip delay

The round trip delay is influenced by several factors, including modulation/error correction delays on the access line (may be adjustable, with trade-offs), propagation delays across the network (typically small), transmission delays (variable dependent upon packet size and line data rate), packet queuing delays in the switches/routers (variable, depending upon traffic congestion levels), and processing delay, primarily at the server (variable, depending upon traffic levels).

The next most important factors affecting data throughput are packet loss and TCP protocol implementation and tuning.

Packet loss

Packet loss can result from line errors that exceed the error correction capability of the xDSL modems, packet errors in the ATM network, or discarded packets due to network congestion on network links or within switches and/or routers.

TCP/IP implementation

Early implementations of TCP/IP are very sensitive to delay and packet loss. Recent extensions (RFC 1323: TCP Large Window and RFC 2018: TCP Selective Acknowledgments) significantly improve throughput in larger delay situations and where packets are occasionally lost due to errors or congestion.

Approaches to troubleshooting slow data transfer speeds

If a customer experiences slow data transfer speeds at all times, and from all sources, the problem is most likely with the customer loop (low line speed, delay) or the customer equipment (PC, PC software or setup).

If several customers on the same UE9000 shelf have the same complaint, always poor performance, then the problem is most likely with the UE9000 equipment or the links to the network.

If the customer experiences slow data transfer speeds only occasionally, and at the same time as other users on the same UE9000 shelf, then the problem is more likely to be network congestion somewhere between the UE9000 shelf and the server, or due to excess load on the server itself.

A careful review of the circumstances helps to find the most probable cause.

Customer premise equipment

It is important to understand that it is not possible for a customer to achieve a file transfer rate that matches the xDSL line rate.

First, the user data rate is approximately 15% less than the xDSL line rate due to protocol overheads (ATM cells, IP, TCP, PPPoE, etc.) and the average packet size. This means an 8 Mb/s xDSL line rate can carry at best approximately 6.8 Mb/s of user data.

Second, the TCP/IP protocol implementation can have a major impact on file transfer rate.

File transfer rate is very dependent upon round trip delay, window sizes, packet errors and buffer sizes. Extensions to TCP (RFC 1323: TCPLW and RFC 2018: SACK) can significantly improve file transfer rates.

For example, Windows 95 has a basic TCP implementation, whereas Windows 98 and higher support the extensions.

With a 6.6 Mb/s line rate, and a round trip delay of 18 msecs, Windows 95 can achieve a file transfer rate of approximately 2.5 Mb/s. Increasing the round trip delay to 34 msecs reduces the file transfer rate to less than half this amount.

Windows 2000 achieves approximately 5.2 Mb/s with a round trip delay of 18 msecs, which is close to the theoretical maximum for that line rate.

See the following web site for a good tutorial on performance tuning TCP:

http://www.psc.edu/networking/perf_tune.html

Round trip delay can be checked by “ping” or “trace route” to a known network device. The shortest path is to the gateway address defined in the PC, and shows the best case delay. Checking delay to other destinations indicates whether the delay is reasonable or not.

In addition, setting up ping for continuous packet transmission (or a large number such as 100) can identify packet errors, since a response timeout is usually the result of a discarded packet due to either error or congestion. A packet loss greater than 1 in 100 is considered poor quality.

ADSL local loop — line rate and user data rate

Each ADSL modem at the UE9000 shelf can be configured for maximum (and minimum) upstream and downstream line rates (see the *UE9000 Data OAM&P User Guide* for information about provisioning subscriber circuits). Depending upon loop length and noise characteristics, the modem may or may not be able to achieve the configured line rate. The modem synchronizes at start-up to the highest line rate that provides an error rate better than 10^{-7} and a signal to noise ratio (SNR) of 6 dB (default configuration values), up to the configured maximum upstream or downstream rate.

On full rate ADSL circuits, if the SNR degrades on the loop, the line rate does not change unless the line loses synchronization, or the error rate drops to approximately 10^{-5} for several minutes. Either situation forces the modem to resynchronize and adjust its line rate.

An error rate approaching 10^{-5} causes a higher packet loss, reducing file transfer throughput, but may not be bad enough to force a resynch. Taking the line out of service (lock, unlock) or turning the customer modem off and on can resynch the line and reduce the error rate.

Note also that if the modem resynchs at a lower rate due to a short term noise condition, and the line quality later improves, the line does not automatically return to a higher line rate. It must be forced to resynch, either by the customer or the network operator.

For G.Lite circuits, similar events will cause the modems to perform a full resynchronization, and, similarly, the subscriber's data session will be interrupted. In addition, there may be a number of “fast” resynchronizations that take place due to other, less severe changes in loop conditions. These “fast

retrains" may cause delays in the user's data session, but should not cause the user data session to drop. See the *UE9000 Data Network Design Guidelines*, Appendix B: "Full-rate ADSL and G.Lite," for more details on fast retrains.

ADSL local loop — ADSL delay

ADSL implementations provide a feature called interleaving to improve the data error rate in the presence of impulse noise on the local loop. Although the error rate may be improved, it is done at the expense of increased delay.

The UE9000 equipment has default interleaving delays of 10 msec upstream and downstream, for a total of 20 msecs.

In situations where impulse noise is not a problem, there may be an improvement in file transfer rate by reducing these delays to zero, especially if the remaining round trip delay is small.

Network transmission facilities, switches, and routers

Network facilities can contribute to poor data transfer rates primarily due packet loss.

Queuing delays vary with traffic levels, but with high speed facilities, queuing delays are typically small and have minimal impact on performance.

Packet loss has a serious impact on performance, and can be caused by either non-correctable data errors on the transmission facilities, or packet discards due to congestion.

Data errors on transmission facilities cause errored IP packets, resulting in retransmissions, and reduced data throughput. If the error rate is high enough to significantly reduce data throughput, the impact is not limited to a particular user, but impact all active users on that facility.

When using the unspecified bit rate (UBR) traffic class for user data service, packet loss due to congestion affects all active users.

If packet loss is suspected, the ATM switches and routers can be monitored for ATM cell errors and cell or packet discards due to congestion. Refer to the user manuals for the particular equipment to determine how to monitor for these conditions. If the equipment or facilities are supported by a third party service provider, request this information from them.

Internet performance problems

Performance problems within the Internet that impact a user data transfer rate is outside the control of the UE9000 network management staff. In this case, it may be sufficient to demonstrate that the source of the problem is not within the UE9000 access network.

One approach to isolating the source of the problem is to provide a server within the UE9000 access network that can be accessed by end users for test purposes. As shown in Figure 1-1 on page 1-3, the server could exist within the ISP cloud. Since this server is within or close to the access network, it can have predictable performance.

While a normal ISP server could be used for testing, it would be preferable to have a separate test server. Since the load on this test server would be minimal, the test results would not be affected by the activity of other users.

If a file transfer from the test server shows acceptable throughput, but a file transfer from the Internet shows poor throughput, the problem is shown to be within the Internet or the remote file server.

uEMS troubleshooting

See Table 1-1 for troubleshooting information on the UE9000 element management system (uEMS) graphical user interface (GUI).

Table 1-1
uEMS troubleshooting

Symptom	Cause	Solution
Communications problems		
uEMS cannot communicate with the ATM card	loss of communications	See Procedure 1-3 on page 1-32 and Procedure 1-7 on page 1-43.
No communication between all ATM cards and the uEMS	Loss of network connectivity	Evaluate the connectivity and status of the transport network.
No hardware flag for an ATM core card that has hardware	communication may be down between the ATM card and uEMS workstation	Verify IP connectivity and SNMP communication from uEMS to the ATM card. See Procedure 1-3 on page 1-32 and Procedure 1-7 on page 1-43.
	HPOV did not discover the ATM card. There is no symbol for the ATM card on the IP Internet submap.	See Procedure 1-5 on page 1-36. If the problem does not clear, see the Hewlett Packard document *Using Network Node Manager*, J1136-90002, for information on discovering IP objects.
	uEMS did not receive an event indicating that a restart completed on the DAC ATM core card provisioned but the ATM hardware is not installed	See Procedure 1-5 on page 1-36.
	Incorrect provisioning	Verify the ATM card has the correct IP address for the uEMS workstation. Verify that uEMS has the correct IP address for the ATM card.

—continued—

Table 1-1
uEMS troubleshooting (continued)

Symptom	Cause	Solution
No communication between one ATM and the uEMS	ATM rebooting	Wait until ATM finishes rebooting.
	ATM has been provisioned, but ATM hardware has not been installed	Install ATM hardware.
	ATM was not provisioned with the uEMS workstation's IP address	• Verify that the ATM core card has the uEMS workstation's IP address using the local craft interface (LCI) • If the ATM core card has an incorrect IP address or no IP address, provision the uEMS IP address on the ATM core card using the LCI • Verify that uEMS is provisioned with the proper ATM core card address
No communication between the ATM card and the TDM cards xDSL line card LEDs do not function properly uEMS cannot detect card insertion on UE9000 shelf	Software or hardware problem on the ATM card or TDM cards	• Switch (swact) the TDMs • Restart the ATM card • Replace the ATM card using Procedure 2-11 on page 2-29.
—continued—		

Table 1-1
uEMS troubleshooting (continued)

Symptom	Cause	Solution
uEMS operation problems		
You cannot provision: • a UE9000 shelf • an ATM core card	UE9000 component was unprovisioned, but the hardware was not removed from the system	remove the unprovisioned ATM or xDSL line card hardware
	the symbol for the UE9000 component was hidden or deleted, but the UE9000 component was not unprovisioned from the uEMS database	unprovision the UE9000 component using the command line interface (CI), then reprovision the UE9000 component
uEMS does not detect inventory and status changes	uEMS or HP OpenView (HPOV) background processes are not functioning correctly the ATM core card is not communicating with the time division multiplexing (TDM) circuit cards	• Check the uEMS and HPOV background processes by typing at the prompt in a terminal window: **/opt/OV/bin/ovstatus** ↵ • Each background process should have a state of RUNNING. • If the background processes are not running, manually start them. To start the HPOV background process type: **/opt/OV/bin/ovstart** ↵ To start the uEMS background process type: **/opt/OV/bin/ovstart hstpmon** ↵

—continued—

Table 1-1
uEMS troubleshooting (continued)

Symptom	Cause	Solution
You cannot provision an xDSL line card	the ATM card is locked	using the ATM pop-up menu, put the ATM in the in-service (unlock) state
	UE9000 component was unprovisioned, but the hardware was not removed from the system	remove the unprovisioned ATM core card or xDSL line card hardware
	the symbol for the UE9000 component was hidden or deleted, but the UE9000 component was not unprovisioned from the uEMS database	unprovision the UE9000 component using the command line interface (CI), then reprovision the UE9000 component
You cannot unprovision a DS1 carrier	someone has attempted to delete all the DS1s	DS1 link numbers 1 and 2 in the IMA group cannot be unprovisioned.
You cannot unprovision an xDSL line card	line card is not locked cross connects are up	lock the line card provision the cross connects down See the *UE9000 Data OAM&P User Guide* for unprovisioning information.
You cannot edit the UE9000 components in a submap	submap is read-only	• Check the bottom left corner of the submap for read-write status • Check if another user has the map open. If another user has the map open, then all other users have read-only access to the map. • See the *UE9000 Data OAM&P User Guide* for information on opening a temporary read-write map.

—continued—

Table 1-1
uEMS troubleshooting (continued)

Symptom	Cause	Solution
You cannot drag a symbol into a submap	used the left or right mouse button	• Use the middle mouse button to drag the symbol. • Check to determine if the submap will accept the particular UE9000 component. Check the messages displayed in the Add Object-Set Attributes dialog.
You cannot add a UE9000 component to a submap	submap is read-only	• Check the bottom left corner of the submap for read-write status. • Check if another user has the map open. If another user has the map opened, then all other users have read-only access to the map. • See the *UE9000 Data OAM&P User Guide* for information on opening a temporary read-write map.
	adding a UE9000 component that cannot be added to the submap	Check to determine if the submap can take the particular UE9000 component. Check the messages displayed in the Add Object-Set Attributes dialog.
	uEMS database disk is full	• In a UNIX terminal window, at the prompt, type: **bdf** ↵ • In a Solaris terminal window, at the prompt, type: **df -bk** ↵ • If the disk is full, free up disk space.

—continued—

Table 1-1
uEMS troubleshooting (continued)

Symptom	Cause	Solution
Trouble status problems		
The alarm counts on uEMS symbols do not match the alarm counts in the Alarm Browser.	• alarm database is out of sync with the uEMS database • alarm database is missing	See Procedure 1-11 on page 1-52.
Subscriber's CPE symbol is red	• PC or modem is turned off	• no action is necessary. When the modem is turned on, the CPE symbol turns green.
	• modem is faulty	• check LED on CPE modem
	• modem is not of the proper type of xDSL to terminate the loop	• replace with the a modem of the correct xDSL type
	• PC is faulty	• replace the PC
uEMS indicates a subscriber loop is down when the loop is up and synchronized	slow uEMS polling of UE9000 components	Wait until uEMS polling is completed. After the loop has been polled, the loop displays as in-service.
	disk is full and uEMS database entries are not being updated	• In a UNIX terminal window, at the prompt, type: **bdf** ↵ • In a Solaris terminal window, at the prompt, type: **df -bk** ↵ • If the disk is full, free up disk space.
uEMS indicates there is excessive data loss on the CPE	• excessive noise on loop • incorrect loop length • faulty hardware	See Procedure 1-1 on page 1-21.

—continued—

Table 1-1
uEMS troubleshooting (continued)

Symptom	Cause	Solution
Operational activity problems		
ATM reboots with previous software load	• invalid software load name on the trivial file transfer protocol (TFTP) server • ATM software load was transferred in ASCII mode • ATM software load is corrupted	See Procedure 1-4 on page 1-33.
ATM does not send SNMP traps to the uEMS workstation	• loss of communication • ATM has wrong uEMS workstation IP address • ATM booting off a different network server than the one the uEMS workstation is on	• See Procedure 1-8 on page 1-46.
—end—		

ATM troubleshooting

See Table 1-2 for troubleshooting information on the ATM core card.

Table 1-2
ATM core card troubleshooting

Symptom	Cause	Solution
uEMS cannot ping the ATM	• No communication between the ATM card and the uEMS workstation • Did not wait more than five seconds to reapply power	• See Procedure 1-7 on page 1-43. • Wait more than five seconds to reapply power.
ATM card does not reboot	• invalid software load name on the trivial file transfer protocol (TFTP) server • ATM software load is corrupted • the TFTP server is down	• See Procedure 1-4 on page 1-33.
ATM card takes too long to restart or reboot	ATM card has been upgraded with a new software load	For a UE9000 shelf equipped with either a DS1 IMA ATM core card or a single DS3 ATM core card: Wait twelve minutes for the ATM card to restart or reboot. If the ATM card does not restart or reboot, reload the ATM software. If the problem continues, see Procedure 1-4 on page 1-33. For a UE9000 shelf equipped with two DS3 ATM core cards: An auto-swact will occur if the “active” DS3 ATM card is restarted/reloaded. Within 3 minutes, the “standby” DS3 ATM card will become “active” ***Note:*** No switch (swact) will occur if the “standby” DS3 ATM card is restarted/reloaded.

—continued—

Table 1-2
ATM core card troubleshooting (continued)

Symptom	Cause	Solution
Cannot perform a switch (swact) between the “active” and “standby” DS3 ATM core cards	• “standby” DS3 ATM card is not ready • second DS3 ATM card is not present in the UE9000 shelf • the “standby” card is reloading • the “active” card is locked • both cards are receiving LOS	• Make sure the “standby” card is active-ready • Install and provision the second DS3 ATM core card • Wait until “standby” card has finished reloading • Unlock the ATM card. See Procedure 2-2 on page 2-4 • Check cabling
NVStore download fails	• Database is corrupt • NVStore file is too large • Network problem	• Call Nortel Networks technical support • Check the path /etc/opt/OV/share/conf/Nortel/HSTP/uems/nvstore and make sure the file size is less than 750 KB. If the file size is larger than 750 KB, contact Nortel Networks technical support • Check network connection
xDSL line card is not passing data service	• xDSL line card is faulty • ATM is faulty • CPE is faulty • no cross-connect is assigned or cross-connect state is not in-service (down)	• See Procedure 1-1 on page 1-21.

—continued—

Table 1-2
ATM core card troubleshooting (continued)

Symptom	Cause	Solution
All received ATM cells are corrupted, generating CRC errors.	• Scrambling is enabled on the far-end equipment • physical layer convergence protocol (PLCP) problem • timing problem • cabling problem, e.g., a mismatch of Ethernet and ATM cables	• Disable scrambling on the far-end equipment, if the UE9000 has a DS1 IMA core card in the shelf. (The DS1 IMA. does not support scrambling. The UE9000 DS3 ATM core card, however, does support scrambling.)
ATM card does not send traps to uEMS workstation	• ATM card is booting off of another network server • ATM card is faulty • IP address of the uEMS workstation is not provisioned on the ATM core card	• See Procedure 1-8 on page 1-46.
ATM card fails an in-service test	faulty ATM card	• See Procedure 1-10 on page 1-50.
ATM card fails an out-of-service test	faulty ATM card	• See Procedure 1-10 on page 1-50.
ATM card is not functioning correctly	• See Procedure 1-10 on page 1-50.	
ATM card needs to be replaced	• See Procedure 2-11 on page 2-29.	
—end—		

Line card troubleshooting

See Table 1-3 for troubleshooting information on the xDSL line card.

Table 1-3
Line card troubleshooting

Symptom	Cause	Solution
xDSL circuit takes a long time to synchronize after power up	• loop is faulty • xDSL circuit is synchronizing to a lower than provisioned data rate speed	• Verify that voice service is provisioned and working on the subscriber loop • Troubleshoot the loop • Test the xDSL line card • Replace the xDSL line card • See Procedure 1-1 on page 1-21.
uEMS GUI cannot detect the xDSL line card No hardware flag for xDSL line card	• voice-only line card in slot • faulty xDSL line card • faulty TDM • uEMS processes not running	• See Procedure 1-9 on page 1-48.
xDSL line card is not passing data service	• xDSL circuit out of synchronization • xDSL line card is locked • CPE is OOS • xDSL circuit is locked • cross-connect is not in-service (down)	• See Procedure 1-1 on page 1-21.
xDSL line card fails a loopback test	• xDSL line card is faulty • ATM is faulty • UE9000 backplane is faulty	• See Procedure 1-6 on page 1-39.

—continued—

Table 1-3
Line card troubleshooting (continued)

Symptom	Cause	Solution
ADSL line card takes a long time to complete a restart reload or xDSL line card takes a long time to complete a restart reload	• line card load has a different DSP load than is currently used • management network congestion	• Wait 5 minutes per subscriber circuit for the reload to complete. See Procedure 2-9 on page 2-20. • Ensure that the network is reliable.
xDSL circuit does not sync to maximum speed or experiences intermittent data transfer	• the line has temporary noise • the subscriber loop features poor characteristics, such as permanent line noise • xDSL line card, ATM card, or CPE may be faulty • excessive subscriber loop length	• wait a few minutes for the noise to clear • see Procedure 1-1 on page 1-19. • see Procedure 1-1 on page 1-19.
—end—		

Procedure 1-1
Troubleshooting connection and data service problems with subscriber service

Use this procedure to:

- evaluate problems with UE9000 customer premise equipment (CPE)
- evaluate a subscriber's connection problems with their internet service provider (ISP)
- troubleshoot when an xDSL line card cannot pass data from the ATM core card to the CPE or vice versa

General problems with the CPE may indicate a specific problem at the subscriber location, central office (CO), or ISP. For more information, refer to the respective CPE user manual.

The following steps suggest ways for you to troubleshoot this type of problem. After completing a step, proceed to the next step only if necessary.

Action

Step	Action

Check that the UE9000 equipment is in-service.

1 From the Subscriber Loop submap (see the *UE9000 Data OAM&P User Guide*), confirm that all the UE9000 equipment is in-service.

If the	Then
ATM card is not in-service (locked)	Put the ATM card in-service.
xDSL line card is not in-service (locked)	Put the xDSL line card in-service.
xDSL circuits are not in-service (locked)	Put the xDSL circuits in-service.
Cross-connects are not in-service (down)	Put the cross-connects in-service (up)
CPE is not in-service	Go to step 2.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action
2	If the circuit is full rate xDSL or G.Lite, ensure that the circuit provisioning matches the capabilities of the CPE. See the *UE9000 Data OAM&P User Guide* for more information.
3	Verify that no there are no outstanding faults against the line card or the circuit under inspection. See Chapter 4, "uEMS faults and events," for more information.
4	Go to the subscriber loop submap and check the status of the data throughput. Verify that the xDSL circuit is in synch with the CPE. See the *UE9000 Data OAM&P User Guide* for more information.

If the minimum data rate is	Then
reached	Go to step 16.
not reached	Go to step 5.

Note: The subscriber circuit should be provisioned with the maximum supported speeds. See the *UE9000 Data OAM&P User Guide* for provisioning information.

Check the Loop Status LED on the CPE

5	Ask the subscriber to check that the CPE is turned on, is plugged into a power source, and is plugged into the correct phone jack.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action
6	Ask the subscriber to check the DSL Network Status LED on the CPE modem as follows:

On a 1-Meg Modem:

If the LED is	Then
green	There is a transport problem with the transport network or PC. Go to step 13.
red or amber	Wait a few moments. If the LED turns green, see above. If the LED stays amber or red, this indicates a problem with the 8+8 card, the CPE, or the phone line. Confirm that the subscriber line has dial tone. This can be done by having the subscriber plug a phone into the phone jack on the CPE. If there is no dial tone on the subscriber line, establish dial tone on the subscriber line. Go to step 7.

On other xDSL Modems:

If the LED is	Then
green or yellow	There may be a problem with the subscriber loop performance, configuration, or with the transport network. Go to step 13.
red or off	There is a problem with either the ATM core card, the xDSL line card, the CPE, or the subscriber's phone line. Confirm that the subscriber line has dial tone. This can be done by having the subscriber plug a phone into the phone jack on the CPE. If there is no dial tone on the subscriber line, establish dial tone on the subscriber line. Go to step 7.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action
7	Ask the subscriber to turn the CPE power off and then on.
8	Wait two minutes for the CPE to synchronize with the xDSL circuit. Ask the subscriber to check the Loop Status LED on the CPE.

On a 1-Meg Modem:

If the LED is	Then
green	Go to step 13.
amber or red	Go to step 9.

On other xDSL Modems:

If the LED is	Then
green or yellow	Go to step 13.
red or off	Go to step 9.

9	One of the phone sets on the line card may be causing the problem. To determine which one, unplug all of the extension phone sets on the line card except for the one you are using.
10	Turn the modem's power off and then turn it back on.
11	To determine which phone set is causing the problem, plug in he phone sets, one by one, until the LED turns red.
12	Discard the faulty phone set.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action
	Check the Subscriber Loop Performance
13	Check for high error rates on the subscriber line at the uEMS. (See "Performance monitoring" on page 2.) If high error rates exist, analyze the characteristics of the line. Troubleshoot any problems if line characteristics appear adverse to xDSL data transmission. If the line appears usable upon inspection, go to step 16. ***Note:*** For a temporary solution to adverse line conditions, change the circuit provisioning parameters to improve immunity to severe line impairments. See the *UE9000 Data OAM&P User Guide* for provisioning information.
	Replace the xDSL line card
14	Put the xDSL line card out-of-service (lock) and replace the xDSL line card. Once the xDSL line card is replaced, put the xDSL line card in-service (unlock).
15	Wait two minutes for the CPE to synchronize with the xDSL circuit. Ask the subscriber to check the Loop Status LED on the CPE.

If the LED is	Then
green or yellow	Go to step 16.
red or off	It is likely that the loop or the CPE is faulty. Replace the CPE and retest. If this fails to clear the problem, test the subscriber loop. See the *UE9000 Voice OAM&P User Guide* for line/loop testing information.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action

Check the Ethernet Link Status LED on the CPE

16 The problem is with the subscriber configuration. Ask the subscriber to check the Ethernet Link Status LED on the CPE.

If the LED is	Then
green	Go to step 17.
off	Ask the subscriber to reconnect the Ethernet cable to the CPE and the PC. Then, have the subscriber check the Ethernet Link Status LED again. If the LED is green, go to step 17. If the LED is off, either the subscriber's Ethernet card is faulty, the Ethernet cable is faulty or disconnected, or the CPE is faulty. Isolate the problem and replace or repair the faulty component.

Check the transport network

17 Ask the subscriber to attempt to connect to another web site.

18 Ask the subscriber to verify that the following information is configured correctly on the PC:

- internet protocol (IP) address of personal computer (PC)
- IP address(es) of the PC gateway(s)

19 Check the configuration of the transport network.

20 Ask the ISP if service is still available to the subscriber.

Check the service configuration

21 Check the CO configuration for the ISP. For example, the transport network may not be configured correctly.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action
22	If you are using a DS1 IMA ATM card, ensure that the far end equipment does not have scrambling enabled on the IMA interface. Scrambling is an ATM parameter that UE9000 equipment does not support over the DS1 IMA links because it is not required at T1 speeds. If scrambling is enabled on the DS1 IMA links, the ATM cells experience payload corruption, resulting in CRC errors at the CPE. ***Note:*** Scrambling is supported on UE9000 shelves equipped with the DS3 ATM core card(s).
Check the ATM card	
23	Check the DS3 ATM core card network interface LED.

If the LED is	Then
green	go to step 25.
amber	a remote alarm indication (RAI) has been detected. Check the Alarm Browser (see the *UE9000 Data OAM&P User Guide*). If the ATM edge switch is not receiving a signal from the DS3 ATM core card, check the following: • DS3 transport network to ATM edge switch • coaxial cable from the Tx output connection of the “active” DS3 ATM core card • DS3 I/O cross-connect assembly • DS3 ATM core card
red	A network loss of signal (LOS) or loss of frame (LOF) condition exists. Go to step 24.

Note 1: In a redundant configuration (UE9000 shelf equipped with two DS3 ATM core cards), a detected RAI will cause the “active” DS3 ATM core card to automatically switch (swact) once to the “standby” DS3 ATM card. If this does not clear the RAI condition, no further swact will take place until the RAI condition is cleared.

Note 2: In a redundant configuration (UE9000 shelf equipped two DS3 ATM core cards), a detected LOS or LOF on only the “active” DS3 ATM core card will cause the traffic to automatically switch (swact) to the “standby” DS3 ATM core card.

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action

24 Check the following:

If there is a network	Then
LOS in a redundant configuration and both DS3 ATM cards are LOS	• check the DS3 transport network feeding the DS3 input of the DS3 I/O cross-connect assembly • check the DS3 I/O cross-connect assembly • check the DS3 ATM core card
LOS in a redundant configuration and one DS3 ATM cards is LOS	• check the coaxial cable between the DS3 ATM card input and the DS3 I/O cross-connect assembly • check the DS3 ATM core card • check the DS3 I/O cross-connect assembly
LOS in a non-redundant system with a DS3 I/O cross-connect assembly	• check the DS3 transport network feeding the DS3 input of the DS3 I/O cross-connect assembly • check the coaxial cable between the DS3 ATM card input and the DS3 I/O cross-connect assembly • check the DS3 ATM core card • check the DS3 I/O cross-connect assembly
LOS in a non-redundant system without a DS3 I/O cross-connect assembly	• check the DS3 transport network feeding the DS3 ATM core card Rx input • check the DS3 ATM core card
LOF	the DS3 ATM card is receiving a signal but cannot synchronize its framing. • check that the DS3 carrier provisioning matches the transport equipment

—continued—

Procedure 1-1 (continued)
Troubleshooting connection and data service problems with subscriber service

Step	Action

25 Verify that other subscribers on the same line card can receive data. Verify that other subscribers on other line cards on the same UE9000 shelf can receive data.

If the ATM card is	Then
sending data to other subscribers	Verify that the ATM card provisioning is correct.
not sending data to other subscribers	Conduct loopback tests as described in Chapter 3, “Testing and performance monitoring,” to isolate where data is being blocked within the shelf.

CAUTION
Loss of communication
Replacing an ATM core card changes the media access control (MAC) address of the ATM core card. Data network devices, such as routers, must be updated with the MAC address of the new ATM core card. If the data network devices are not updated, communication with the ATM core card is lost. Inform your network administrator of the new MAC address for the ATM core card.

26 If the problem still exists, replace the ATM card. See Procedure 2-11 on page 2-29. If the problem does not clear, go to step 27.

27 If you did not replace the CPE in step 16, replace the CPE.

28 If the problem still exists, contact your next level of support.

—end—

Procedure 1-2
Troubleshooting slow data rate speeds

Use this procedure to evaluate slow data rate speeds on a subscriber loop.

A slow data rate speed can be part of normal operations. Not all users will achieve the maximum data rate. Some causes of slow data rates are:

- the subscriber's data service is configured to a lower data rate
- the subscriber loop supports only a low data rate

Refer to section "Troubleshooting slow data transfer speeds" on page 1-3 for more information.

Note: Slow data rate speeds may also be caused by half-taps, bridge-taps, mixed-gauges, loading coils, and other cable irregularities.

Action

Step	Action
1	Check the provisioned data rate on the subscriber loop. **a.** Go to the LC submap. **b.** Right-click on the CCT symbol for the subscriber loop and select **Provision/Edit** from the pop-up menu. *The Object Description dialog appears.* **c.** Double-click **UE9000 Map Application** in the Object Attributes field. *The Attributes for Object dialog appears.* **d.** Write the provisioned data rates for the subscriber loop here. Maximum Downstream Speed (kbs): _____ Maximum Upstream Speed (kbs): _____
2	Go to the Subscriber Loop submap.

—continued—

Procedure 1-2 (continued)
Troubleshooting slow data rate speeds

Step	Action

3 Check the actual data rates under the connection symbol between the CCT symbol and the CPE symbol.

If the actual data rates	Then
match the provisioned data rates	The subscriber loop is operating correctly.
does not match the provisioned data rates	Go to step 4.

4 Use the following table to troubleshoot the problem.

Possible cause	Solution
Temporary noise on line.	Wait a few minutes for the noise to clear.
The CPE modem is within 12 inches of a personal computer (PC).	Ask the subscriber to move the CPE modem away from the PC.
Subscriber loop is degraded. For example, the subscriber loop has permanent line noise.	Analyze the characteristics of the subscriber loop. Troubleshoot any problems or contact your next level of support.
Subscriber is transferring data from a slow Internet site.	Tell the subscriber that the site is operating at a data rate slower than the data rate of the CPE modem.
CPE modem or line card has failed.	• Troubleshoot using Procedure 1-1 on page 1-21. • If the problem does not clear, check the Event Browser for CPE or xDSL LC failure events. Replace any faulty devices.
Subscriber loop length is excessive or undesirable cable makeup	•

5 If the problem still exists, contact Nortel Networks technical support.

—end—

Procedure 1-3
uEMS cannot communicate with the ATM core card via SNMP

Use this procedure to solve communication problems between UE9000 element management system (uEMS) and the ATM core card.

The following steps suggest ways for you to troubleshoot this type of problem. After completing a step, proceed to the next step only if necessary.

Action

Step	Action
1	Verify that the uEMS can ping the ATM core card. Highlight the ATM core card in the shelf submap (see the *UE9000 Data OAM&P User Guide*), then select **Ping** from the Fault pull-down menu.

If the uEMS	Then
can ping the ATM core card	Go to step 3.
cannot ping the ATM core card	See Procedure 1-7 on page 1-43.

2	If the problem still exists, verify that the transport network is correctly configured to pass SNMP messages.
3	If the problem still exists, contact your next level of support.

—end—

Procedure 1-4
ATM core card reboots with previous software load

Use this procedure when the ATM core card cannot reboot after a software upgrade.

Occasionally an ATM core card cannot reboot with an updated ATM core card software load. Instead, the ATM core card reboots with the previous ATM core card software load. The following table lists possible causes and solutions for this problem.

Possible cause	Solution
Hewlett Packard workstation trivial file transfer protocol (TFTP) server has an invalid software load name for the ATM core card software.	Verify that the following were provisioned correctly: • the directory path for the ATM core card software • the new ATM core card software load name See the steps in this procedure for information on how to verify provisioning.
File permissions are incorrect	Verify that the ATM card load file and all the directories along the path allow read access.
The new ATM core card software load was corrupted during the file transfer protocol (FTP) transfer to the uEMS. The load may have been transferred in ASCII mode.	Transfer the new ATM core card software load in binary mode to the uEMS. Check logs to confirm a corrupted load was rejected.
Excessive errors in the transport network caused the new software load to fail.	Ask the network administrator about the integrity of the network.

—continued—

Procedure 1-4 (continued)
ATM core card reboots with previous software load

Action

Step	Action
1	Verify that the new ATM core card software load name is correctly provisioned on the ATM core card. From the ATM core card pop-up menu, select: **Show -> ATMIF-DS1 Inventory ->Atmif** (for DS1 ATM core card) **Show -> ATMIF-DS3 Inventory** (for DS3 ATM core card) *The Inventory dialog appears.*
2	Scroll down through the Inventory dialog and check to see if the provisioned Atmif load name matches the current Atmif load name. **If** / **Then** yes / Go to step 6. no / Go to step 3.
3	Select **Change ATMIF Provisioned Load** from the pop-up menu. *The Load Selection Pop-up dialog appears.*
4	Select the desired load from the list of available loads and click **OK**. *The Load Selection Pop-up dialog disappears. The provisioned load is changed in the uEMS database.* ***Note:*** If there are two DS3 ATM core cards in the UE9000 shelf, you can update the load for the “standby” DS3 ATM card first, then perform a switch (swact) (“standby” card becomes the “active” card; the “active” card becomes the “standby”). You can then update the load on the other DS3 card. For more information see Procedure 2-8, “Performing a manual swact on the DS3 ATM core cards” on page 2-19.

—continued—

Procedure 1-4 (continued)
ATM core card reboots with previous software load

Step	Action

CAUTION
Loss of service
When the ATM card performs a restart, all data traffic on the UE9000 shelf is dropped.

Note: (if there are two DS3 ATM core cards in the UE9000 shelf, data service is dropped only if a cold restart is performed on the "active" ATM card.)

5 Perform a restart reload on the ATM card. Select **Maintenance** -> **Atmif** -> **Restart** -> **Reload -> Normal** from the pop-up menu. See Procedure 2-6 on page 2-14 for more information.

6 Verify that a valid software load has been placed on the uEMS workstation in the correct directory. In a terminal window at the prompt, type:

cd /etc/opt/OV/share/loads/Nortel/HSTP ↵

ls ↵

A list of the software loads in the directory appears. If the file is not listed, obtain a new copy of it.

7 Check the network connections and the TFTP server on the uEMS workstation.

8 If the problem still exists, contact your next level of support.

—end—

Procedure 1-5
No hardware flag for ATM core card

Use this procedure when a no hardware flag is displayed over the ATM core card symbol on any UE9000 element management system (uEMS) submap.

The following steps suggest ways for you to troubleshoot this type of problem. After completing a step, proceed to the next step only if necessary.

Action

Step	Action

1 Verify that the ATM core card hardware is installed and commissioned properly. For installation information, see the *UE9000 Installation Quick Reference Guide*. For commissioning information, see the *UE9000 Data System Setup Guide*.

If the ATM core card hardware is	Then
installed	The uEMS has not discovered the ATM core card. Go to step 2.
not installed	Install and commission the ATM core card hardware.

2 Verify that the uEMS is provisioned with the correct IP address for the ATM card. See the *UE9000 Data OAM&P User Guide* for more information.

3 Verify that the ATM core card is provisioned with the proper uEMS IP address and the proper card IP address. See the *UE9000 Data System Setup Guide* for more information.

4 Verify that the uEMS workstation has IP connectivity to the ATM card using Procedure 1-7 on page 1-43.

—continued—

Procedure 1-5 (continued)
No hardware flag for ATM core card

Step	Action

CAUTION
Loss of service
When the ATM card performs a restart, all data service on the UE9000 shelf is dropped.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, data service is dropped only if a restart is performed on the “active” ATM card.

CAUTION
Loss of provisioning
When the ATM card performs a restart, it loses all provisioning information until uEMS reloads it after the restart is completed.

Note: When a DS1 IMA ATM core card is restarted, all provisioning information is re-passed from the uEMS to the ATM card. The DS3 ATM core card, however, includes an on-board non-volatile store. Because of this, after the DS3 card restarts, a card can come up completely without uEMS intervention. Instead of all the provisioning information passing to the Atmif, only the changes are sent, allowing for a faster recovery time. For more information, see Procedure 2-7, “Updating Recovery Data” on page 2-17.

5 Cold restart the ATM core card by selecting:

Maintenance -> Atmif -> Restart -> Cold (for DS1 ATM)

Maintenance ->Restart -> Cold (for DS3 ATM)

The ATM card restarts.

Note: If this command is not accepted, go to step 6.

—continued—

Procedure 1-5 (continued)
No hardware flag for ATM core card

Step	Action

CAUTION
Loss of service
Reseating an ATM core card drops data service on all xDSL line cards in the UE9000 shelf.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, data service is dropped only if a restart is performed on the “active” ATM card.

6 Reseat the ATM core card.

CAUTION
Loss of communication
Replacing an ATM core card changes the media access control (MAC) address of the ATM core card. Data network devices, such as routers, must be updated with the MAC address of the new ATM core card. If the data network devices are not updated, communication with the ATM core card is lost. Inform your network administrator of the new MAC address for the ATM core card.

7 Replace the ATM core card. See Procedure 2-11 on page 2-29.

8 If the problem still exists, contact your next level of support.

—end—

Procedure 1-6
xDSL fails loopback test

Use this procedure when an xDSL line card fails a loopback test.

Note: It is assumed in this procedure that other xDSL line cards on the shelf are functioning properly.

Action

Step	Action

1 If an xDSL line card fails a loopback test, perform the loopback test again.

If the xDSL	Then
fails the loopback test	Go to step 2.
passes the loopback test	End the procedure.

CAUTION
Loss of service
When the xDSL line card performs a Cold, Normal Load, or Forced Load restart, all voice and data service on the xDSL line card is dropped.

CAUTION
Loss of provisioning
When the xDSL line card performs a cold restart, it loses all provisioning information until uEMS reloads it after the cold restart is completed.

2 From the xDSL line card pop-up menu, select:

Maintenance ->LC -> Restart -> Cold

The xDSL line card restarts.

—continued—

Procedure 1-6 (continued)
xDSL fails loopback test

Step	Action
3	Repeat the loopback test. If the test fails, go to step 4.

CAUTION
Loss of service
Removing an xDSL line card drops voice and data service on all subscriber circuits on that line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card can drop all voice and data service for five to eight minutes.

4	Reseat the xDSL line card and repeat the loopback test. If the test fails, go to step 5.
5	From the xDSL line card pop-up menu, select: **Maintenance ->LC** ->**Lock** -> **Normal** *The xDSL line card is out of service.*
6	Replace the xDSL line card and manually change the state to in-service (unlocked).

—continued—

Procedure 1-6 (continued)
xDSL fails loopback test

Step	Action
7	Repeat the loopback test. If the test fails, go to step 5.

CAUTION
Loss of service
When the ATM card performs a restart, all data service on the UE9000 shelf is dropped.

Note 1: If there are two DS3 ATM core cards in the UE9000 shelf, data service is dropped only if a restart is performed on the “active” ATM card.

Note 2: When a DS1 IMA ATM core card is restarted, all provisioning information is re-passed from the uEMS to the ATM card. The DS3 ATM core card, however, includes an on-board non-volatile store. Because of this, after the DS3 card restarts, a card can come up completely without uEMS intervention. Instead of all the provisioning information passing to the Atmif, only the changes are sent, allowing for a faster recovery time. For more information, see Procedure 2-7, “Updating Recovery Data” on page 2-17.

8 From the ATM symbol pop-up menu, select:

Maintenance -> Atmif -> Restart -> Cold (for DS1 ATM)

Maintenance -> Restart -> Cold (for DS3 ATM

The ATM card restarts.

—continued—

Procedure 1-6 (continued)
xDSL fails loopback test

Step	Action

CAUTION
Loss of service
Reseating an ATM core card drops data service on all xDSL line cards in the UE9000 shelf.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, data service is dropped only if a restart is performed on the “active” ATM card.

9 Reseat the ATM core card.

CAUTION
Loss of communication
Replacing an ATM core card changes the media access control (MAC) address of the ATM core card. Data network devices, such as routers, must be updated with the MAC address of the new ATM core card. If the data network devices are not updated, communication with the ATM core card is lost. Inform your network administrator of the new MAC address for the ATM core card.

10 If the problem still exists, replace the ATM core card. See Procedure 2-11 on page 2-29.

11 If the problem still exists, contact your next level of support.

—end—

Procedure 1-7
Verify uEMS workstation has IP connectivity to the ATM core card

Use the following procedure to verify that the uEMS workstation has basic connectivity to the ATM card. This is a prerequisite for SNMP access and file transfer of software update.

Probable cause

The ATM core card is not installed or is faulty, or the IP network between the uEMS and ATM core card is down.

Action

Step	Action
1	Verify that the ATM core card hardware is installed and has been commissioned. See the *UE9000 Data System Setup Guide* for more information.
2	Verify that the uEMS can ping the ATM core card. Highlight the ATM core card in the shelf submap (see the *UE9000 Data OAM&P User Guide*), then select: **Fault -> Ping** *The Ping dialog box appears.*

If the uEMS	Then
can ping the ATM core card	There is basic IP connectivity to the ATM card. You are finished with this procedure.
cannot ping the ATM core card	Go to step 3.

—continued—

Procedure 1-7 (continued)
Verify uEMS workstation has IP connectivity to the ATM core card

Step	Action

3 Attempt to ping a different ATM card. Highlight a different ATM core card in the shelf submap (see the *UE9000 Data OAM&P User Guide*), then select:

Fault -> Ping

The Ping dialog box appears.

If the uEMS	Then
can ping the ATM core card	There is basic IP connectivity to the ATM network. Go to step 4.
cannot ping the ATM core card	There is a network IP connectivity problem. Identify and fix.

4 Is the IP address assigned to the subject ATM card provisioned correctly in uEMS?

If	Then
yes	Go to step 5.
no	Correct the provisioning. See the *UE9000 Data OAM&P User Guide* for more information. Go to step 1.

5 Connect to the ATM core card local craft interface (LCI) port (see the *UE9000 Data System Setup Guide* for more information). Are the IP address, subnet mask, gateway address, and VPI/VCI provisioned correctly? Is inband/out-of-band management properly configured?

If	Then
yes	Go to step 6.
no	Correct the provisioning using the LCI connection. Go to step 1.

—continued—

Procedure 1-7 (continued)
Verify uEMS workstation has IP connectivity to the ATM core card

Step	Action

6 At the uEMS workstation, open a terminal window and issue a trace route to the IP address of the ATM card. This indicates how far the uEMS has IP connectivity toward the ATM card.

If the trace route indicates	Then
connectivity to the gateway router at the ATM network	the uEMS and the uEMS LAN are functioning correctly. The problem is likely within the ATM network. Isolate and correct the fault.
no access to the gateway router	the problem is likely within the uEMS LAN segment to the gateway. Isolate and correct the fault.

CAUTION
Loss of communications
If you are using a DS1 IMA ATM card, ensure that the far end equipment does not have scrambling enabled on the IMA interface. Scrambling is an ATM parameter that UE9000 equipment does not support over the DS1 IMA links because it is not required at T1 speeds. If scrambling is enabled over the DS1 IMA links, the ATM cells experience payload corruption, resulting in CRC errors at the CPE.

Note: Scrambling is supported on UE9000 shelves equipped with the DS3 ATM core card(s).

7 If the problem still exists, then the ATM is either faulty or provisioned incorrectly, or a cabling or facilities problem exists at the site. Investigate and correct these issues.

—end—

Procedure 1-8
ATM core card is not sending traps to the uEMS workstation

Use this procedure to troubleshoot when the ATM core card is not sending traps to the UE9000 element management system (uEMS) workstation.

The following steps suggest ways for you to troubleshoot this type of problem. After completing a step, proceed to the next step only if necessary.

Action

Step	Action
1	Verify that the uEMS can ping the ATM core card. Highlight the ATM core card in the shelf submap (see the *UE9000 Data OAM&P User Guide*), then select: **Fault -> Ping** *The Ping dialog box appears.*

If the uEMS	Then
can ping the ATM core card	Go to step 3.
cannot ping the ATM core card	Go to step 2.

Step	Action
2	Are the IP address, subnet mask, and gateway address assigned to the subject ATM card provisioned correctly in uEMS?

If	Then
yes	Repeat step 1. If the problem still exists, go to Procedure 1-7 on page 1-43.
no	Correct the provisioning. See the *UE9000 Data OAM&P User Guide* for more information. Go to step 1.

—continued—

Procedure 1-8 (continued)
ATM core card is not sending traps to the uEMS workstation

Step	Action

3 Verify that the ATM card can communicate with uEMS using SNMP. From the pull-down menu, select:

Fault -> Nortel uEMS -> verify com

Was the test successful?	Then
yes	Go to step 4.
no	Go to step 5.

4 The ATM card should be sending traps to uEMS. If no traps are being sent, go to step 6.

5 Verify that the ATM card has been provisioned with the correct IP address for the uEMS workstation. See the *UE9000 Data System Setup Guide* for more information.

CAUTION
Loss of service
Restarting an ATM core card drops data service on all xDSL line cards in the UE9000 shelf.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, data service is dropped only if a restart is performed on the “active” ATM card.

6 Perform a restart reload on the ATM card. Select **Maintenance** -> **Atmif** -> **Restart** -> **Reload -> Normal** from the pop-up menu. See Procedure 2-6 on page 2-14 for more information.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, you can update the load for the “standby” DS3 ATM card first, then perform a switch (swact) (“standby” card becomes the “active” card; the “active” card becomes the “standby”). You can then update the load on the other DS3 card. For more information see Procedure 2-8, “Performing a manual swact on the DS3 ATM core cards” on page 2-19.

7 If the problem still exists, contact your next level of support.

—end—

Procedure 1-9
No hardware flag for an xDSL line card

Use this procedure when

- a no hardware flag appears over the xDSL line card symbol on any UE9000 element management system (uEMS) submap
- the uEMS cannot detect an xDSL line card
  - — xDSL disappears from the uEMS submap
  - — xDSL symbol appears with incorrect information

Action

Step	Action

CAUTION
Loss of service
You must wait more than five seconds to reinsert a line card after removing the line card from the shelf to reseat it. If you do not wait more than five seconds, the line card can drop all voice and data service for five to eight minutes.

1 Verify that the xDSL line card is properly seated.

If the xDSL is	Then
properly seated	Go to step 2.
not properly seated	Reseat the xDSL line card. If the problem continues, go to step 3.

2 Verify that the TDM card is properly seated.

If the TDM card is	Then
properly seated	Go to step 3.
not properly seated	Reseat the TDM card. If the problem continues, go to step 3.

—continued—

Procedure 1-9 (continued)
No hardware flag for an xDSL line card

Step	Action
3	Check that the line card in the slot is an xDSL line card and not a voice-only line card.

If the line card in the slot is	**Then**
an xDSL line card	Using the pop-up menu, put the xDSL line card out-of-service (lock) and replace the xDSL line card. Put the xDSL line card in-service (unlock).
voice-only line card	Replace the voice-only line card with an xDSL line card. Using the pop-up menu, put the xDSL line card in-service (unlock).

4	If the problem continues, contact your next level of technical support.

—end—

Procedure 1-10
Troubleshooting an ATM core card

Use this procedure to evaluate whether an ATM core card is faulty.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, one is designated the “active” card, one is designated the “standby” card. In the event of a DS3 card hardware failure, or loss of service (LOS), loss of frame (LOF), or remote alarm indication (RAI), the “standby” card detects the failure of the “active” card and takes over (auto-swact).

There will be a service outage while the newly active DS3 ATM card configures itself to match the previously active configuration. Service will then be restored automatically.

Action

Step	Action

CAUTION
Loss of service
Restarting an ATM drops data service on all xDSL line cards in the UE9000 shelf.

1 Is communication up between the ATM and the UE9000 element management system (uEMS) workstation?

If	Then
yes	Cold restart the ATM. If the ATM does not function correctly, go to step 2.
no	Use Procedure 1-7 on page 1-43 to evaluate the problem. If the ATM continues to act faulty after communication between the uEMS workstation and the ATM is restored, cold restart the ATM. If the ATM still does not function correctly, go to step 2.

—continued—

Procedure 1-10 (continued)
Troubleshooting an ATM core card

Step	Action

CAUTION
Loss of service
Reseating an ATM drops data service on all xDSL line cards in the UE9000 shelf.

2 Reseat the ATM. If the ATM does not function correctly, go to step 3.

CAUTION
Loss of communications
If you are using a DS1 IMA ATM card, ensure that the far end equipment does not have scrambling enabled on the IMA interface. Scrambling is an ATM parameter that UE9000 equipment does not support over the DS1 IMA links because it is not required at T1 speeds. If scrambling is enabled on the DS1 IMA links, the ATM cells experience payload corruption, resulting in CRC errors at the CPE.

Note: Scrambling is supported on UE9000 shelves equipped with the DS3 ATM core card(s).

3 Replace the ATM. See Procedure 2-11 on page 2-29 for information on how to replace the ATM.

—end—

Procedure 1-11
Synchronizing the alarm database

Use this procedure to synchronize the alarm database with the uEMS database. This procedure also rebuilds the alarm database if it is missing.

The alarm browser can be either open or closed when this command is issued. However, if it is open, you must press the refresh button or wait 60 seconds for an automatic refresh to occur.

This procedure is not service affecting and can be followed at any time.

Action

Step	Action
1	Issue the following command from a uEMS screen: **Misc -> Nortel uEMS -> Synchronize Alarm Browser** *A confirmation dialog box appears when the alarm database is synchronized.*
2	Click **OK**. *The confirmation dialog disappears and the alarm browser functions normally.*

—end—

Hardware management

This chapter includes procedures for managing the hardware on the Universal Edge 9000 (UE9000) system.

See the *UE9000 Data OAM&P User Guide* for information on upgrading the software loads in the ATM card and the xDSL line card.

Chapter contents

This chapter contains the following tasks:

Task	See
Upgrading the firmware	Procedure 2-10 on page 2-23
Replacing an ATM core card	Procedure 2-11 on page 2-29
Replacing an xDSL multi-circuit line card	Procedure 2-12 on page 2-32
—end—	

Procedure 2-1
Inventorying UE9000 components

Use this procedure to inventory UE9000 components using the UE9000 element management system (uEMS) graphical user interface (GUI).

The inventory command inventories only those components hierarchically beneath the UE9000 component where the inventory command was selected.

For example, if you are in the Root submap and use the HSTP-Network symbol's pop-up menu to select inventory, all UE9000 components in the data network will be inventoried. If you are in the Shelf submap and use the ATM core card symbol's pop-up menu to select inventory, then only the ATM card and the carriers associated with it are inventoried.

Action

Step	Action
1	Go to any uEMS GUI submap (see the *UE9000 Data OAM&P User Guide*). From any symbol's pop-up menu, select **Show** -> **Inventory**, then the UE9000 component you want to inventory. ***Note:*** If you want to inventory all UE9000 components, select **Show** -> **Inventory** -> **All** from the HSTP network symbol pop-up menu. *The Inventory dialog appears listing all UE9000 components.*
2	When you are finished with the Inventory dialog, click the **Close** button.

—end—

Procedure 2-2
Changing the operational state of an ATM core card

Use this procedure to change the operational state of an ATM core card using the UE9000 element management system (uEMS) graphical user interface (GUI).

Note: You must lock an object before you can unprovision it.

Action

Step	Action
1	Go to the Shelf submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
When the ATM core card is put in the Lock state, all data service on the UE9000 shelf is dropped.

—continued—

Procedure 2-2 (continued)
Changing the operational state of an ATM core card

Step	Action
2	From the ATM core card's pop-up menu, select: **Maintenance -> Atmif -> [state] -> [method]** (for DS1 ATM) **Maintenance -> [state] -> [method]** (for DS3 ATM) where [state] is the operational state **Unlock** is in-service **Lock** is out-of-service [method] is how the state is achieved **Normal** is performed at the earliest convenient time. **Force** is performed immediately regardless of the traffic load or condition. If there is no communication between the uEMS and the ATM core card, the change is saved in the uEMS database and will take effect after communication has been restored. In this case, uEMS attempts to make the change at intervals defined by the Network Polling Configuration in the HPOV Options menu. *The ATM core card changes to the indicated operational state.* **—end—**

Procedure 2-3
Changing the operational state of a DS1 carrier

Use this procedure to change the operational state of a DS1 carrier using the UE9000 element management system (uEMS) graphical user interface (GUI).

You must lock an object before you can unprovision it.

Note: DS1 carrier numbers 1 and 2 are always the IMA timing references and cannot be locked or unprovisioned.

Action

Step	Action
1	Go to the ATM card submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
Locking a DS1 carrier will reduce the available bandwidth of the IMA group proportionately, and may result in a momentary loss of data.

—continued—

Procedure 2-3 (continued)
Changing the operational state of a DS1 carrier

Step	Action
2	From the DS1 carrier's pop-up menu, select: **Maintenance** -> **[state]** -> **[method]** where [state] is the operational state **Unlock** is in-service **Lock** is out-of-service [method] is how the state is achieved **Normal** is performed at the earliest convenient time. **Force** is performed immediately regardless of the traffic load or condition. If there is no communication between the uEMS and the ATM core card, the change is saved in the uEMS database and will take effect after communication has been restored. In this case, uEMS attempts to make the change at intervals defined by the Network Polling Configuration in the HPOV Options menu. *The DS1 carrier changes to the indicated operational state.* **—end—**

Procedure 2-4
Changing the operational state of xDSL multi-circuit line cards

Use this procedure to change the operational state of one or all xDSL multi-circuit line cards (MLC) using the UE9000 element management system (uEMS) graphical user interface (GUI).

Note: You must lock an object before you can unprovision it.

Action

Step **Action**

If you are changing the operational state of	Then
one xDSL MLC	go to step 1
all xDSL MLCs at the same time	go to step 5

Changing the operational state of one xDSL multi-circuit line card:

1 Go to the Shelf submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
Locking an xDSL MLC will cause loss of all data service on all subscriber circuits on that MLC.

—continued—

Procedure 2-4 (continued)
Changing the operational state of xDSL multi-circuit line cards

Step	Action
2	Right -click on the object.
3	From the xDSL MLC's pop-up menu, select: **Maintenance** -> **[xDSL]** -> **[state]** -> **[method]** where [state] is the operational state **Unlock** is in-service **Lock** is out-of-service [method] is how the state is achieved **Normal** is performed at the earliest convenient time. **Force** is performed immediately regardless of the traffic load or condition. If there is no communication between the uEMS and the line card, the change is saved in the uEMS database and will take effect after communication has been restored. In this case, uEMS attempts to make the change at intervals defined by the Network Polling Configuration in the HPOV Options menu.
4	When locking, on the popup window press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The xDSL MLC changes to the indicated operational state.*

Changing the operational state of all xDSL multi-circuit line cards:

5	Go to the Network Element submap.
6	Select the shelf.
7	Right click on the mouse and hold.
8	From the xDSL MLC's menu, select: **Maintenance** -> **[xDSL]** -> **[state]** -> **[method]**

—continued—

Procedure 2-4 (continued)
Changing the operational state of xDSL multi-circuit line cards

Step	Action
	where [state] is the operational state **All Unlock** is in-service **All Lock** is out-of-service [method] is how the state is achieved **Normal** is performed at the earliest convenient time. **Force** is performed immediately regardless of the traffic load or condition. If there is no communication between the uEMS and the line card, the change is saved in the uEMS database and will take effect after communication has been restored. In this case, uEMS attempts to make the change at intervals defined by the Network Polling Configuration in the HPOV Options menu.
9	When locking, on the popup window press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The xDSL MLC changes to the indicated operational state.* **—end—**

Procedure 2-5
Changing the operational state of xDSL subscriber circuits

Use this procedure to change the operational state of one or all xDSL subscriber circuit using the UE9000 element management system (uEMS) graphical user interface (GUI).

Note: You must lock an object before you can unprovision it.

Action

Step **Action**

If you are changing the operational state of	Then
one xDSL subscriber circuit	go to step 1
all xDSL subscriber circuits at the same time	go to step 4

Changing the operational state of one xDSL subscriber circuit:

1 Go to the LC submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
When the xDSL subscriber circuit is put in the Lock state, all data service on the xDSL subscriber circuit is dropped.

—continued—

Procedure 2-5 (continued)
Changing the operational state of xDSL subscriber circuits

Step	Action
2	From the xDSL subscriber circuit's pop-up menu, select: **Maintenance -> Circuit -> [state]** -> **[method]** where [state] is the operational state **Unlock** is in-service **Lock** is out-of-service [method] is how the state is achieved **Normal** is performed at the earliest convenient time. **Force** is performed immediately regardless of the traffic load or condition. If there is no communication between the uEMS and the line card, the change is saved in the uEMS database and will take effect after communication has been restored. In this case, uEMS attempts to make the change at intervals defined by the Network Polling Configuration in the HPOV Options menu.
3	When locking, on the popup window press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The xDSL subscriber circuit changes to the indicated operational state.*
Changing the operational state of all xDSL subscriber circuits:	
4	Go to the LC submap.
5	Select the LC.
6	Right click on the mouse and hold.

—continued—

Procedure 2-5 (continued)
Changing the operational state of xDSL subscriber circuits

Step	Action
7	From the xDSL subscriber circuit's menu, select: **Maintenance -> Circuit -> [state]** -> **[method]** where [state] is the operational state **All Unlock** is in-service **All Lock** is out-of-service [method] is how the state is achieved **Normal** is performed at the earliest convenient time. **Force** is performed immediately regardless of the traffic load or condition. If there is no communication between the uEMS and the line card, the change is saved in the uEMS database and will take effect after communication has been restored. In this case, uEMS attempts to make the change at intervals defined by the Network Polling Configuration in the HPOV Options menu.
8	When locking, on the popup window press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The xDSL MLC changes to the indicated operational state.* *The xDSL subscriber circuit changes to the indicated operational state.* **—end—**

Procedure 2-6
Restarting an ATM core card

Use this procedure to restart an ATM core card using the Universal Edge 9000 element management system (uEMS) graphical user interface (GUI). To upgrade all the firmware on an entire shelf or NE, see Procedure 2-10 on page 2-23.

> ***Note:*** If there are two DS3 ATM core cards in the UE9000 shelf, you can update the load for the "standby" DS3 ATM card first, then perform a swact ("standby" card becomes the "active" card; the "active" card becomes the "standby"). You can then update the load on the other DS3 card. For more information see Procedure 2-8, "Performing a manual swact on the DS3 ATM core cards" on page 2-19.

The uEMS supports these types of restarts: **Cold**, **Reload Normal**, and **Reload Force**. These options are described below.

A **Cold** restart causes the card to reset and then reload itself with the load currently stored in the card's flash memory. During a cold restart, the card loses its provisioning information. However, the uEMS sends the provisioning information to the card after the reload is complete.

> ***Note:*** When a DS1 IMA ATM core card is restarted, all provisioning information is re-passed from the uEMS to the ATM card. The DS3 ATM core card, however, includes an on-board non-volatile store. Because of this, after the DS3 card restarts, a card can come up completely without uEMS intervention. Instead of all the provisioning information passing to the Atmif, only the changes are sent, allowing for a faster recovery time. For more information, see Procedure 2-7, "Updating Recovery Data" on page 2-17.

A restart **Reload Normal** causes the card to compare its current load with the load provisioned in uEMS. If the loads are the same, the card performs a cold restart. If the loads are different, the card performs a restart reload force.

A restart **Reload Force** causes uEMS to load the card with the provisioned load, regardless of what the card's current load is. The card then performs a cold restart.

—continued—

Procedure 2-6 (continued)
Restarting an ATM core card

Action

Step	Action
1	Go to the Shelf submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
When the ATM core card is put in the Lock state, all data service on the UE9000 shelf is dropped.

2 From the ATM card's pop-up menu, select:

Maintenance -> Atmif -> Lock -> Normal (for DS1 ATM)

Maintenance -> Lock -> Normal (for DS3 ATM)

The ATM card becomes out-of-service (subscriber traffic stops, but alarms can be generated).

Note: When a DS1 IMA ATM core card is restarted, all provisioning information is re-passed from the uEMS to the ATM card. The DS3 ATM core card, however, includes an on-board non-volatile store. Because of this, after the DS3 card restarts, a card can come up completely without uEMS intervention. Instead of all the provisioning information passing to the Atmif, only the changes are sent, allowing for a faster recovery time. For more information, see Procedure 2-7, "Updating Recovery Data" on page 2-17.

—continued—

Procedure 2-6 (continued)
Restarting an ATM core card

Step	Action
3	From the ATM card's pop-up menu, select: **Maintenance -> Atmif -> Restart -> Cold** (for DS1 ATM) **Maintenance -> Restart -> Cold** (for DS3 ATM) *The ATM card restarts. The "restart cold" annotation text disappears from the symbol.* ***Note:*** The type of restart (**Cold**, **Reload Normal**, **Reload Force**) you select depends on what you are trying to accomplish. Refer to the restart descriptions discussed in the beginning of Procedure 2-6 on page 2-14.
4	From the ATM card's pop-up menu, select: **Maintenance -> Atmif -> Unlock -> Normal** (for DS1 ATM) **Maintenance -> Unlock -> Normal** (for DS3 ATM) *The ATM card is in service.* **—end—**

Procedure 2-7
Updating Recovery Data

When a DS1 IMA ATM core card is restarted, all provisioning information is re-passed from the uEMS to the ATM card. The DS3 ATM core card, however, includes an on-board non-volatile store. The DS3 provisioning information is synchronized automatically every 24 hours. Because of this, after the DS3 card restarts, a card can come up completely without uEMS intervention. Instead of all the provisioning information passing to the Atmif, only the last 24-hour changes are sent, allowing for a faster recovery time.

The Update Recovery Data is pushed up to the DS3 ATM core card(s) automatically. This is set up as a cron job that runs daily at 1:00 a.m.

You can also manually update the latest configuration information. Use this procedure to manually update the latest configuration data to the DS3 ATM core cards.

Action

Step	Action
1	Go to the Shelf submap (see the *UE9000 Data OAM&P User Guide*).
2	Choose one of the following:

If you want to	Then
transfer the configuration file to the ATM core card without restarting the ATM card (will not interrupt data traffic)	go to step 3
transfer the configuration file to the ATM core card and then restart the ATM card after the transfer (will interrupt data traffic)	go to step 5

—continued—

Procedure 2-7 (continued)
Updating Recovery Data

Step	Action
3	From the ATM card's pop-up menu, select: **Maintenance ->Update Recovery Data ->No Reboot** *A Confirmation dialog appears.*
4	Select **OK**. *The configuration file is transferred to the ATM core card.* You are finished with this procedure.
5	From the ATM card's pop-up menu, select: **Maintenance ->Update Recovery Data ->With Reboot** *A Confirmation dialog appears.*
6	Select **OK**. *The configuration information is transferred to the ATM core card. Once the transfer is complete, the ATM card is restarted.* ***Note:*** Do not select the **Restart** button in the confirmation dialog. Selecting the **Restart** button will re-transfer the configuration file and trigger another card restart. You are finished with this procedure. **—end—**

Procedure 2-8
Performing a manual swact on the DS3 ATM core cards

If there are two DS3 ATM core cards in the UE9000 shelf, one is designated the “active” card, one is designated the “standby” card. In the event of a DS3 card hardware failure, or loss of service (LOS), loss of frame (LOF), or remote alarm indication (RAI), the “active” card detects the failure and sends a signal to the “standby” (auto-swact).

There is a five to six minute data outage while the newly active DS3 ATM core card configures itself to match the previously active configuration. Service will then be restored automatically.

You can also choose to manually perform a swact.Use this procedure to perform a manual swact on the DS3 ATM core cards.

Action

Step	Action
1	Go to the Shelf submap (see the *UE9000 Data OAM&P User Guide*).
2	Update the provisioning information. See Procedure 2-7, “Updating Recovery Data” on page 2-17.
3	From the ATM card’s pop-up menu, select: **Maintenance -> Swact** *A dialog box appears, asking if you are sure you perform the swact.*
4	Select **OK**. *When the swact is complete, a message appears saying the appropriate DS3 ATM card (DAC A or DAC B) is now active and configuring.* ***Note:*** A swact on a fully-loaded UE9000 shelf can take up to 6 minutes.

Procedure 2-9
Restarting an xDSL multi-circuit line card

Use this procedure to restart an xDSL multi-circuit line card (MLC) using the UE9000 element management system (uEMS) graphical user interface (GUI). To upgrade all the firmware on an entire shelf or NE, see Procedure 2-10 on page 2-23.

The uEMS supports these types of restarts: **Cold**, **Reload Normal**, and **Reload Force**. These options are described below.

A **Restart Cold** causes the card to reset and then reload itself with the load currently stored in the card's flash memory. During a cold restart, the card loses its provisioning information. However, the uEMS sends the provisioning information to the card after the reload is complete.

A **Restart Reload** normal causes the card to compare its current load with the load provisioned in the uEMS. If the loads are the same, the card performs a cold restart. If the loads are different, the card performs a restart reload.

A **Restart Reload Force** causes uEMS to load the card with the provisioned load, regardless of what the card's current load is. The card then performs a cold restart.

> ***Note:*** If, for any reason, the ATM core card is restarted before the download is complete, the download does not resume. Therefore, always wait for the download to finish before restarting the ATM core card.

On the ADSL 4+4 line card, if the DSP firmware downloaded to the LC is different from the DSP firmware currently in use, an additional five minutes will be required to upgrade the DSP flash memory with the new firmware.

> ***Note:*** During a DSP download, the LC symbol displays "ATUC Loading" annotation text. You can also check the Event Browser for messages indicating the start or completion of a line card download.

—continued—

Procedure 2-9 (continued)
Restarting an xDSL multi-circuit line card

Action

Step	Action
1	Go to the Shelf submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
The data service resumes once the xDSL MLC has completed a reset and has re-established the link with the remote CPE modem.

2	From the xDSL MLC's pop-up menu, select: **Maintenance -> [xDSL] -> Lock -> Normal**
3	Press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The line card is locked.*

CAUTION
Time delay
Line card loads that include a new digital signal processor (DSP) load require an additional five minutes to complete.

Note: This additional delay is only applicable to a Restart->Reload.

4	From the xDSL MLC's pop-up menu, select: **Maintenance** -> **[xDSL]** -> **Restart** -> **Cold** ***Note:*** In addition to Cold, other options for this step are Reload Normal and Reload Force. See descriptions of each at the beginning of Procedure 2-9 on page 2-20.
5	Press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The xDSL MLC restarts.*

—continued—

Procedure 2-9 (continued)
Restarting an xDSL multi-circuit line card

Step	Action
6	From the xDSL MLC's pop-up menu, select: **Maintenance -> [xDSL] -> Unlock -> Normal** *The line card is unlocked.* **—end—**

Procedure 2-10
Upgrading the firmware

Use this procedure to send the software loads that have been provisioned from the uEMS workstation to the equipment.

Action

Step	Action

1 What are you upgrading?

If you are upgrading the firmware on	Then
one xDSL MLC	go to step 2.
one ATM core card	go to step 9.
all cards of one type in one shelf	go to step 15.
all cards of all types in one shelf	go to step 21.
all the firmware on an NE	go to step 26.

Upgrading the firmware on a single multi-circuit line card

CAUTION
Loss of service
Upgrading the firmware on a line card drops all data service for that line card for the duration of the upgrade.

2 Go to the shelf submap (see the *UE9000 Data OAM&P User Guide*).

3 From the xDSL MLC's pop-up menu, select:

Maintenance ->Show ->[xDSL] LC Inventory

The Inventory dialog appears.

—continued—

Procedure 2-10 (continued)
Upgrading the firmware

Step	Action

4 Scroll down through the Inventory dialog and check to see if the provisioned LC load name matches the current LC load name. Does the current load name match the desired load name?

If	Then
yes	you are finished with this procedure.
no	go to step 5.

5 From the xDSL MLC's pop-up menu, select:

Change [xDSL] LC Provisioned Load

The Load Selection Pop-up dialog appears.

6 Select the desired load from the list of available loads and click **OK**.

The Load Selection Pop-up dialog disappears. The provisioned load is changed in the uEMS database.

7 Perform a restart reload normal on the xDSL MLC. See Procedure 2-9, "Restarting an xDSL multi-circuit line card" on page 2-20 for more information.

8 You are finished with this procedure.

Upgrading the firmware on a single ATM core card

CAUTION
Loss of service
Upgrading the firmware on an ATM core card drops all data service on that shelf for the duration of the upgrade.

Note: If there are two DS3 ATM core cards in the UE9000 shelf, you can update the load for the "standby" DS3 ATM card first, then perform a swact ("standby" card becomes the "active" card; the "active" card becomes the "standby"). You can then update the load on the other DS3 card. For more information see Procedure 2-8, "Performing a manual swact on the DS3 ATM core cards" on page 2-19.

—continued—

Procedure 2-10 (continued)
Upgrading the firmware

Step	Action
9	Go to the shelf submap (see the *UE9000 Data OAM&P User Guide*). From the ATM core card pop-up menu, select: **Show -> ATMIF-DS1 Inventory ->Atmif** (for DS1 ATM core card) **Show -> ATMIF-DS3 Inventory** (for DS3 ATM core card) *The Inventory dialog appears.*
10	Scroll down through the Inventory dialog and check to see if the provisioned Atmif load name matches the current Atmif load name. Does the current load name match the desired load name?

If	Then
yes	you are finished with this procedure..
no	go to step 11.

11	Select **Change ATMIF Provisioned Load** from the pop-up menu. *The Load Selection Pop-up dialog appears.*
12	Select the desired load from the list of available loads and click **OK**. *The Load Selection Pop-up dialog disappears. The provisioned load is changed in the uEMS database.*
13	Perform a restart reload normal on the ATM core card. See Procedure 2-6, “Restarting an ATM core card” on page 2-14 for more information.
14	You are finished with this procedure.

—continued—

Procedure 2-10 (continued)
Upgrading the firmware

Step	Action
	Upgrading the firmware of all cards of one type in one shelf
15	Go to the shelf submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
When upgrading the firmware on multiple line cards, the cards are updated individually in a sequential fashion. Data service is dropped only on the line card currently being updated, for the duration of the upgrade.

Note: Upgrading the firmware on an ATM core card drops all data service on that shelf for the duration of the upgrade.

16	From the shelf pop-up menu, select: **Attribute change -> All [ATMIF, xDSL LC] Loads** *A Confirmation dialog appears.*
17	Click **OK**. *The Load Selection Popup dialog appears.*
18	Select the desired load from the list of available loads and click **OK**. *The Load Selection Pop-up dialog disappears. The provisioned load is changed in the uEMS database.*
19	Perform a restart reload normal on the card. See either Procedure 2-6, “Restarting an ATM core card” on page 2-14, or Procedure 2-9, “Restarting an xDSL multi-circuit line card” on page 2-20.
20	You are finished with this procedure.

—continued—

Procedure 2-10 (continued)
Upgrading the firmware

Step	Action

Upgrading the firmware on all cards of all types in one shelf

CAUTION
Loss of service
When upgrading the firmware on multiple line cards, the cards are updated individually in a sequential fashion. Data service is dropped only on the line card currently being updated, for the duration of the upgrade.

Note: Upgrading the firmware on an ATM core card drops all data service on that shelf for the duration of the upgrade.

21 Repeat steps 15 through 18 for each ATM core card, and each xDSL MLC.

22 From the shelf pop-up menu, select:

Firmware Upgrade -> this shelf

A Confirmation dialog appears.

23 Select **OK**.

A status window appears.

24 When “Upgrade completed” appears, click **Close**.

The status window disappears.

25 You are finished with this procedure.

—continued—

Procedure 2-10 (continued)
Upgrading the firmware

Step	Action
	Upgrading all the firmware on an NE
26	Go to the NE submap (see the *UE9000 Data OAM&P User Guide*).

CAUTION
Loss of service
When upgrading the firmware on multiple line cards, the cards are updated individually in a sequential fashion. Data service is dropped only on the line card currently being updated, for the duration of the upgrade.

Note: Upgrading the firmware on an ATM core card drops all data service on that shelf for the duration of the upgrade.

27	Repeat steps 15 through 18 for each ATM core card, and each xDSL MLC for each shelf in the NE.
28	From the NE pop-up menu, select: **Firmware Upgrade -> on all shelves** *A warning appears to tell you that this command is service affecting.*
29	Click **OK**. *The warning disappears and a status window appears.*
30	When “Upgrade completed” appears, click **Close**. *The status window disappears.*
31	You are finished with this procedure.

—end—

Procedure 2-11
Replacing an ATM core card

Use this procedure to replace an ATM core card.

Action

Step	Action

CAUTION
Loss of communication
Replacing an ATM core card changes the media access control (MAC) address of the ATM core card. Data network devices, such as routers, must be updated with the MAC address of the new ATM core card. If the data network devices are not updated, communication with the ATM core card is lost. Inform your network administrator of the new MAC address for the ATM core card.

CAUTION
Loss of service
If the UE9000 shelf is equipped with only one ATM core card, replacing the card drops all data service on the entire UE9000 shelf. If the shelf is equipped with two DS3 ATM core cards, make sure the card you are replacing is not the “active” card.

Note: Voice service will not be affected.

1 Put the ATM core card out-of-service. Select:

Maintenance -> Atmif -> Lock -> Normal (for DS1 ATM)

Maintenance -> Lock -> Normal (for DS3 ATM)

The ATM core card is out-of-service (locked).

—continued—

Procedure 2-11 (continued)
Replacing an ATM core card

Step	Action

DANGER
Risk of injury or equipment damage
Hazardous voltages may exist on the cables and connectors. Handle these cables with care.

2 Remove the cables from the front of the ATM core card to be replaced.

3 Unlock the top and bottom card latches and pull the card outward.

4 Carefully slide the new card into the slot and seat it into the UE9000 backplane connector. Gently move tight-fitting cards from side to side while inserting.

5 Lock the card latches on the top and bottom of the card.

6 Configure the ATM card using the procedures described in the *UE9000 Data System Setup Guide*.

7 Connect the cables to the front of the new ATM core card.

The LEDs illuminate for a few seconds before resuming normal operation. See the LED Quick Reference on the back cover of this guide.

—continued—

Procedure 2-11 (continued)
Replacing an ATM core card

Step	Action

Verify that the correct load is provisioned

8 Go to the shelf submap (see the *UE9000 Data OAM&P User Guide*) and right click the ATM card symbol. Select **Show -> Inventory -> Atmif** from the pop-up menu.

The Atmif Inventory window appears.

9 Double-click **UE9000 Map Application** in the Object Attributes field.

The Attributes for Objects dialog appears.

10 Does the provisioned load name match the current load name?

If	Then
yes	Go to step 11.
no	Perform a restart reload on the ATM card. From the pop-up menu, select: **Maintenance -> Atmif -> Restart -> Reload -> Normal** (for DS1 ATM) **Maintenance** -> **Restart** -> **Reload -> Normal** (for DS3 ATM)

Put the ATM card in service

11 Put the ATM core card in-service. Select:

Maintenance -> Atmif -> Unlock -> Normal (for DS1 ATM)

Maintenance -> Unlock -> Normal (for DS3 ATM)

The ATM core card is in-service.

Update recovery data

Note: This procedure is for a UE9000 shelf equipped with DS3 ATM core card(s). Not supported for DS1 IMA core cards.

12 From the ATM card's pop-up menu, select:

Maintenance ->Update Recovery Data ->No Reboot

A Confirmation dialog appears.

13 Select **OK**.

The configuration file is transferred to the ATM core card.

—end—

Procedure 2-12
Replacing an xDSL multi-circuit line card

Use this procedure to replace an xDSL multi-circuit line card (MLC).

CAUTION
Loss of service
Replacing an xDSL MLC drops all voice and data service on the xDSL MLC.

CAUTION
Loss of service
You must wait more than five seconds to reinsert a line card after removing the line card from the shelf to reseat it. If you do not wait more than five seconds, the line card can drop all voice and data service for five to eight minutes.

Action

Step	Action
	Take all voice facilities out of service
1	From the Network Element Status screen on the AccessNode, display the required facility screen: **fa mlc [shelf #] [mlc #].**↵ where [shelf #] **1** to **7** [mlc #] **1** to **16** (or **0** to **15** for UE9000 DMS) *The selected carrier screen appears.* ***Note:*** For more information about voice facilities, see the *UE9000 Voice OAM&P User Guide*.

—continued—

Procedure 2-12 (continued)
Replacing an xDSL multi-circuit line card

Step	Action
2	Change the operating state of the facilities to OOS: **chgstate [state] [first circuit] [last circuit]**↵ where [state] — the operating state: **is** or **oos** [first circuit] — the first line number in the desired range from **1** to **4** (for ADSL) or **0** to **3** (for UE9000 DMS) The [first circuit] parameter must be less than the [last circuit] parameter. [last circuit] — the last line number in the desired range from **1** to **4** (for ADSL) or **0** to **3** (for UE9000 DMS) If you change state from IS to OOS, the system prompts for confirmation (**yes** or **no**). Confirm the change to OOS by entering **yes**.
3	Press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The facility screen is updated with the new operating state.*
Take all data facilities out of service	
4	From the uEMS GUI Shelf submap (see the *UE9000 Data OAM&P User Guide*), right click the xDSL MLC symbol. Select **Maintenance** -> **ADSL4** -> **Lock** -> **Normal** from the pop-up menu.
5	Press the **OK** button to confirm, or the **Cancel** button to cancel the action. *The xDSL MLC is out-of-service.*

—continued—

Procedure 2-12 (continued)
Replacing an xDSL multi-circuit line card

Step	Action

Physically replace the card

DANGER
Risk of injury or equipment damage
Hazardous voltages may exist on the VF cables and connectors. Handle these cables with care.

6 Remove the cable(s) from the front of the card to be replaced.

7 Unlock the top and bottom card latches and pull the card outward.

8 Carefully slide the new card into the slot and seat it into the UE9000 backplane connector. Gently move tight-fitting cards from side to side while inserting.

9 Lock the card latches on the top and bottom of the card.

10 Connect the cable(s) to the front of the new card.

The LEDs illuminate for a few seconds before resuming normal operation. See LED Quick Reference on the back cover of this guide.

Verify that the correct load is provisioned

11 Go to the shelf submap (see the *UE9000 Data OAM&P User Guide*) and right click the line card symbol. Select **Show -> Inventory** from the pop-up menu.

The Line Card Inventory window appears.

12 Double-click **UE9000 Map Application** in the Object Attributes field.

The Attributes for Objects dialog appears.

13 Does the provisioned load name match the desired load name?

If	Then
yes	Go to step 14.
no	Perform a restart reload on the line card. Select **Maintenance** -> **[xDSL]** -> **Restart** -> **Reload -> Normal** from the pop-up menu.

—continued—

Procedure 2-12 (continued)
Replacing an xDSL multi-circuit line card

Step	Action
	Put all data facilities in service
14	From the uEMS workstation, put the xDSL MLC in-service. Select: **Maintenance -> [xDSL] -> Unlock -> Normal.** *The xDSL MLC is in-service.*
	Update recovery data
	Note: This procedure is for a UE9000 shelf equipped with DS3 ATM core card(s). Not supported for DS1 IMA core cards.
15	From the ATM card's pop-up menu (see Procedure 2-7, "Updating Recovery Data" on page 2-17), select: **Maintenance ->Update Recovery Data ->No Reboot** *A Confirmation dialog appears.*
16	Select **OK**. *The configuration file is transferred to the ATM core card.*
	Put all voice facilities in service
17	From the Network Element Status screen on the AccessNode, display the required facility screen: **fa mlc [shelf #] [mlc #]**↵ where [shelf #] **1** to **7** [mlc #] **1** to **16** (or **0** to **15** for UE9000 DMS) *The selected facility screen appears.*

—continued—

Procedure 2-12 (continued)
Replacing an xDSL multi-circuit line card

Step	Action
18	Change the operating state of the facilities to IS: **chgstate [state] [first circuit] [last circuit]**↵ where [state] the operating state: **is** or **oos** [first circuit] the first line number in the desired range from **1** to **4** (for ADSL) or **0** to **3** for UE9000 DMS The [first circuit] parameter must be less than the [last circuit] parameter. [last circuit] the last line number in the desired range from **1** to **4** (for ADSL) or **0** to **3** for UE9000 DMS *The facility screen is updated with the new operating state.* **—end—**

Testing and performance monitoring

This chapter describes how to perform routine tests on the Universal Edge 9000 (UE9000) system and monitor the performance of UE9000 facilities.

Chapter contents

This chapter contains the following topics:

This chapter contains the following tasks.

Performance monitoring

The uEMS GUI may be configured to poll SNMP MIB variables on the ATM core card and to plot the collected data on a table or a graph. Use the pop-up menus of the xDSL subscriber circuit (LC submap) and the DS1 carrier (DAC submap) to initiate the process, as described in the following sections.

You can also view these variables using the MIB browser feature of Hewlett Packard OpenView. To open the MIB browser, select **Misc->SNMP MIB Browser**. See the Hewlett Packard OpenView documentation for information on how to use this tool.

CAUTION

Database corruption

Do not use the MIB browser to change provisioning or state information in uEMS. The MIB browser, which is a part of HP OpenView, can only be used to view MIB information in uEMS.

Creating customized graphs

Hewlett Packard OpenView allows you to create customized graphs. To create a graph, select **Options -> MIB Application Builder:SNMP**. See the HP OpenView documentation for information on how to use this tool. When finished, record the application ID and issue this command:

/opt/OV/bin/Nortel/HSTP/uems/tools/convertGraphAppToUE9000.sh [application ID]

Performance monitoring on ADSL data circuits

The ADSL subscriber circuit symbol pop-up menu provides the following methods for tracking data.

Table 3-1
Performance monitor data for ADSL subscriber circuits

This command...	displays these variables
Monitor -> ATM stats (access side)	inTotal, outTotal, inDiscard This table displays real-time data for the ATM card.
Monitor -> Rx/Tx Rates	ChanCurrTxRate, CurrAttainableRate Units = bits per second This graph displays real-time data for the ATU-C and ATU-R.
Monitor -> Signal Strength	CurrSnrMgn, CurrAtn Units = dB This graph displays real-time data for the ATU-C and ATU-R.
Monitor -> G.Lite Counters	This graph displays data for the current 15-minute window for the number of fast retrains and failed fast retrains for the link.
Monitor -> ADSL Errors	CorrectedBlks, UncorrectedBlks This graph displays data for the current 15-minute window for the ATU-C and ATU-R.
Monitor -> Performance -> ADSL Atuc	Lofs, Loss, Lols, Lprs, ESs, Inits This graph displays data for the current 15-minute window for the ATU-C.
Monitor -> Performance-> ADSL Atur	Lofs, Loss, Lprs, ESs This graph displays data for the current 15-minute window for the ATU-R.
Monitor -> Performance -> ADSL Atuc Perfs	The Atuc Perfs graph displays the number of Atuc Lof, Los and Lol faults that have been asserted since the ATM card was reset.
Monitor -> Performance -> ADSL Atur Perfs	The Atur Perfs graph displays the number of Atur Lof, Los and Lpr faults that have been asserted since the ATM card was reset.

—continued—

Table 3-1
Performance monitor data for ADSL subscriber circuits (continued)

This command...	displays these variables
Monitor -> Performance -> Enterprise Atuc	FecI, CrcI, HecI, OcdI, LcdI This graph displays data for the current 15-minute window for the ATU-C.
Monitor -> Performance -> Enterprise Atur	FecI, CrcI, HecI, OcdI, LcdI This graph displays data for the current 15-minute window for the ATU-R.
—end—	

See Table 3-2 on page 3-4 for a description of all the uEMS variables that can be graphed.

Table 3-2
Performance monitoring variables for ADSL subscriber circuits

Variable	Description
CurrAtn	Line attenuation This is the measured difference (in tenth dB) in the total power transmitted by the peer ATU and the total power received by this ATU. This variable should vary between 0 and 60 dB. An example of trouble indication would be a large change over a short time period. This value is determined in accordance with ANSI T1.413.
CurrSnrMgn	Noise margin This is the noise margin (in tenth dB) as seen by this ATU with respect to its received signal. This variable should be at least 6 dB for full rate ADSL circuits, and at least 4dB for G.Lite circuits. An example of trouble indication would be a noise margin of less than 6 dB or 4dB +/- 1dB for the various service types. These values are determined in accordance with ANSI T1.413 and G.992.2. Possible causes for lower values may be noise on the loop. Refer to the "Check the Subscriber Loop Performance" section in Procedure 1-1, "" on page 1-21. This value is determined in accordance with ANSI T1.413.
—continued—	

Table 3-2 (continued)
Performance monitoring variables for ADSL subscriber circuits

Variable	Description
CurrOutputPwr	Total output power This is the total output power (in tenth dBm) from the modem as measured during the last activation sequence. This variable is higher for long subscriber loops and lower for short subscriber loops. The power level is selected by the modems when they establish the connection. An example of trouble indication would be a value that is not constant over time.
CurrAttainableRate	Maximum attainable rate This is the maximum currently attainable data rate (in bits per second) by the modem. This value is equal or greater than the ChanCurrTxRate. This variable is set to the maximum value that could be attained if the CurrSnrMgn were zero. An example of trouble indication would be if this variable fell below the ChanCurrTxRate.
ChanCurrTxRate	Current rate This is the current rate of transmission (in bits per second) between the ATU-R and the ATU-C. The current rate is selected by the modems when they establish the connection. This value remains constant during the link. A step change indicates when the link is dropped and reconnected. An example of trouble indication would be if the current rate increases or decreases over time, or if it changes often.
ChanPrevTxRate	Previous rate This is the previous rate of transmission (in bits per second) between the ATU-R and the ATU-C. (See ChanCurrTxRate for more information).
ChanCrcBlockLength	Channel data block length This is the size of a channel's data block that is subject to a CRC check. This variable includes the number of redundant check bytes and the number of message bytes over which the check bytes provide protection. This value is rate dependent.

—continued—

Table 3-2 (continued)
Performance monitoring variables for ADSL subscriber circuits

Variable	Description
ChanInterleaveDelay	Interleave delay This is the transmission delay (in milliseconds) introduced by the interleaving process. This value is determined in accordance with ANSI T1.413.
FastRetrains	For G.Lite circuits only. A count of the number of Fast Retrains attempted by modem in response to changing line conditions, in order to maintain the provisioned performance parameters. Fast Retrains can be initiated by common line events such as a phone going on/off hook, dialling or ringing. A large number or Fast Retrains can indicate a high amount of phone activity or poor line quality.
FailedFastRetrains	For G.Lite circuits only. A count of the number of Fast Retrains that failed, requiring a full retrain by the modems. A Fast Retrain failure may occur if the modem is unable to select an appropriate line profile from its table that meets or exceeds the provisioned performance parameters for the new line conditions. (A profile is a parameter lookup table stored by the modem and is based on a history of previously encountered line conditions.) A profile selection may fail because the new line condition has never been encountered before; in this case the modem will try to create a new profile to use the next time this line condition is seen. A profile selection may also fail if a similar line condition was encountered previously but the profile was not saved because the profile table is full. An example of trouble would be if there were a high number of Failed Fast Retrains in relation to the number of Fast Retrains. Possible corrective action is to manually clear the profile table by selecting “Maintenance -> Circuit -> G.Lite -> Clear Retrain Profiles.
Lofs	Loss of frame * This is the number of loss of framing (LOF) faults. For a description of line card and circuit faults, see “Line card and circuit faults” on page 4-28.
Loss	Loss of signal * This is the number of loss of signal (LOS) faults. For a description of line card and circuit faults, see “Line card and circuit faults” on page 4-28.
—continued—	

Table 3-2 (continued)
Performance monitoring variables for ADSL subscriber circuits

Variable	Description
Lols	Loss of link * This is the number of loss of link (LOL) faults. For a description of line card and circuit faults, see "Line card and circuit faults" on page 4-28.
Lprs	Loss of power * This is the number of loss of power faults. For a description of line card and circuit faults, see "Line card and circuit faults" on page 4-28.
ESs	Errored seconds * This is the number of one-second intervals containing one or more cyclical redundancy check (CRC) anomalies or containing one or more LOS or severely errored frame (SEF) defects.
Inits	Line initialization * This is the number of line initialization attempts. It includes both successful and unsuccessful attempts.
CrcI	Cyclical redundancy check * This is the number of CRC anomalies which occur on the interleaved data stream.
FecI	Forward error correction * This is the number of forward error correction (FEC) anomalies which occur on the interleaved data stream.
HecI	Header error check * This is the number of header error check (HEC) anomalies which occur on the interleaved data stream.
LcdI	Loss of cell delineation * This is the number of loss of cell delineation anomalies which occur on the interleaved data stream.
ReceivedBlks	Received blocks * This is the number of encoded blocks received on this channel.
TransmittedBlks	Transmitted blocks * This is the number of encoded blocks transmitted on this channel.

—continued—

Table 3-2 (continued)
Performance monitoring variables for ADSL subscriber circuits

Variable	Description
CorrectedBlks	Corrected blocks * This is the number of blocks received with errors that were corrected. These blocks are passed on as good data.
UncorrectedBlks	Uncorrected blocks * This is the number of blocks received with uncorrectable errors.
* ***Note***: These variables are counters for the current 15-minute window. These variables are available for ATU-C or ATU-R. An example of trouble indication would be if the “15Min Threshold Trap Exceeded” event for any of these counters appeared in the alarm browser, or if the values are approaching the defaults noted in Table 3-2 on page 4 of the *UE9000 Data OAM&P User Guide* for the thresholds. Possible causes may be noise on the loop. Refer to the “Check the Subscriber Loop Performance” section in Procedure 1-1, “” on page 1-21.	
—end—	

Performance monitoring on DS1 circuits

The Carrier symbol pop-up menu provides the following graphs for tracking data:

Table 3-3
Performance monitor graph for DS1 circuits

This graph...	displays these variables
DS1 Carrier	dsx1CurrentESs dsx1CurrentSESs dsx1CurrentUASs dsx1CurrentLCVs
IMA Link	imaLinkImaViolations imaLinkNeSevErroredSec imaLinkFeSevErroredSec imaLinkNeUnavailSec imaLinkFeUnavailSec

These variables are described in the following table.

Table 3-4
Performance monitoring variables for DS1 circuits

Variable	Description
dsx1CurrentESs	This is the number of errored seconds encountered by a DS1 interface in the current 15-minute interval.
dsx1CurrentSESs	This is the number of severely errored seconds encountered in the current 15-minute interval.
dsx1CurrentUASs	This is the number of unavailable seconds encountered by a DS1 interface in the current 15-minute interval.
dsx1CurrentLCVs	This is the number of line code violations (LCVs) encountered by a DS1 interface in the current 15-minute interval.
—continued—	
imaLinkImaViolations	This is the number of errored, invalid or missing ICP cells during a non-SES-IMA condition.
imaLinkNeSevErroredSec	This is the number of one second intervals containing either of the following: • several IV-IMA defects • one or more link defects (e.g., LOS, OOF/LOF, AIS, LCD), LIF, LODS defects during a non-UAS-IMA condition
imaLinkFeSevErroredSec	This is the number of one second intervals containing one or more RDI-IMA defects.

Table 3-4 (continued)
Performance monitoring variables for DS1 circuits

Variable	Description
imaLinkNeUnavailSec	This is the number of unavailable seconds at near-end. Unavailability begins at the onset of 10 contiguous SES-IMA defects. Unavailability ends at the onset of 10 contiguous seconds with no SES-IMA defects.
imaLinkFeUnavailSec	This is the number of unavailable seconds at far-end: Unavailability begins at the onset of 10 contiguous SES-IMA-FE defects. Unavailability ends at the onset of 10 contiguous seconds with no SES-IMA-FE defects.
—end—	

Performance monitoring on DS3 circuits

The Carrier symbol pop-up menu provides the following graphs for tracking data:

Table 3-5
Performance monitor graph for DS3 circuits

This graph....	displays these variables
DS3 Carrier	dsx3CurrentLES dsx3CurrentUASs dsx3IntervalCCVs dsx3IntervalCESs

These variables are described in the following table.

Table 3-6
Performance monitoring variables for DS3 circuits

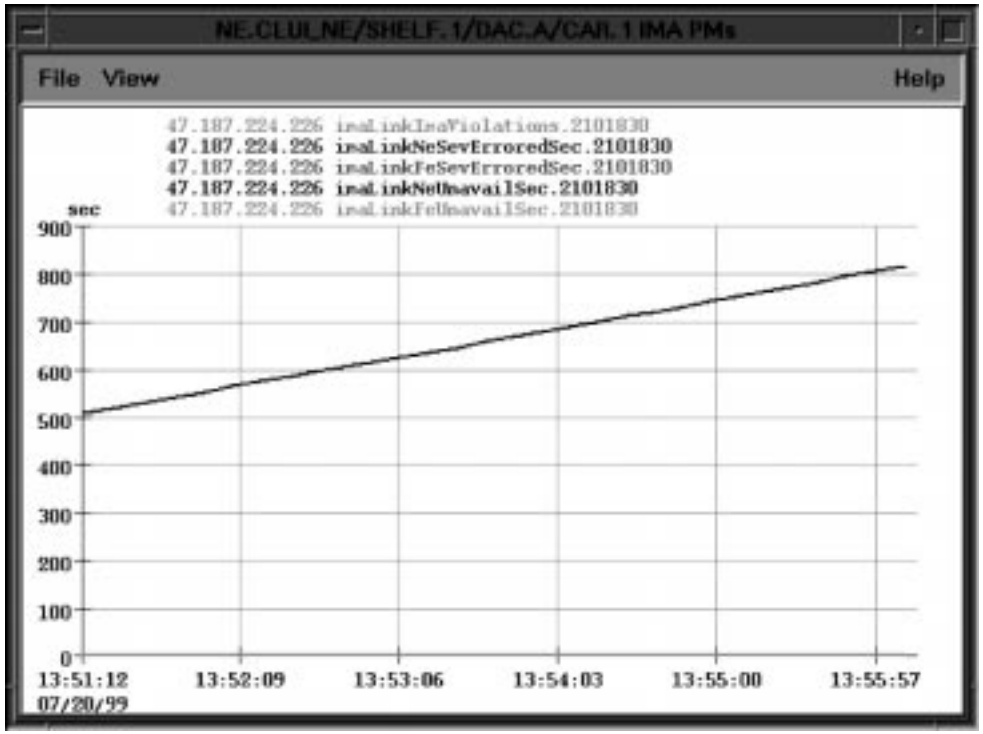
Variable	Description
dsx3CurrentLESs	The number of line errored seconds encountered by a DS3/E3 interface in the current 15-minute interval.
dsx3CurrentUASs	The counter associated with the number of unavailable seconds encountered by a DS3 interface in the current 15-minute interval.
dsx3IntervalCCvs	The number of C-bit coding violations encountered by a DS3 interface in one of the previous 96 individual 15-minute intervals.
dsx3IntervalCESs	The number of C-bit errored seconds encountered by a DS3 interface in one of the previous 96 individual 15-minute intervals.

Sample Graph

Figure 3-1 shows a sample performance monitoring graph.

Figure 3-1
Sample performance monitoring graph

UE-1041



Performing tests in uEMS

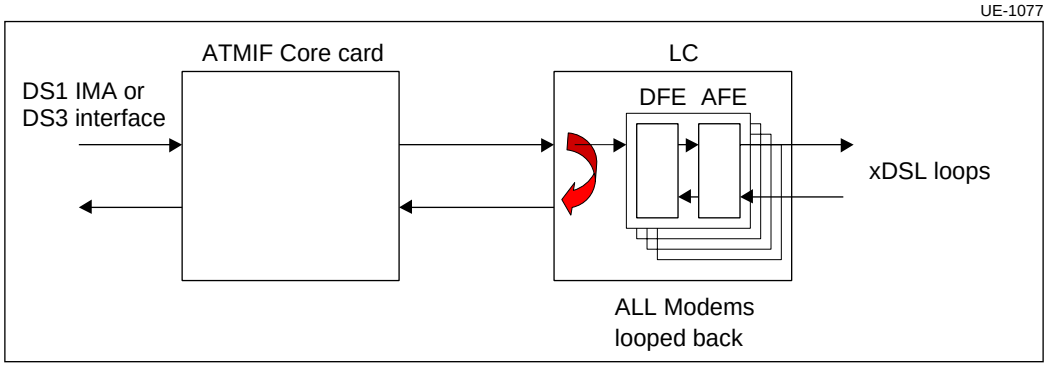
Data loopbacks aid in isolating faulty equipment. The UE9000 system performs automatic checks of the data being sent, but some areas of the UE9000 equipment are not monitored by these checks. Loopbacks allow you to check areas of the equipment that are not automatically monitored.

There are two types of data loopbacks: in-service (IS) and out-of-service (OOS). IS loopbacks are used while the UE9000 equipment is passing traffic and do not affect data service. OOS loopbacks are used when the UE9000 equipment is not passing traffic and affect data service.

Procedure 3-1
Performing the ATM loopback upstream test

This test loops ATM cells back toward the carrier network interface at the backplane interface to the line card. During the test, all of the line card circuitry is isolated. You can use this test to verify the ability of the ATM card and the backplane to properly handle ATM cells.

Figure 3-2
ATM loopback upstream test



This test:

- is service affecting for all line circuits on the line card
- runs continuously until manually stopped
- can be run while the line card is either locked or unlocked
- cannot be run at the same time as the ATM loopback downstream test

—continued—

Procedure 3-1 (continued)
Performing the ATM loopback upstream test

Action

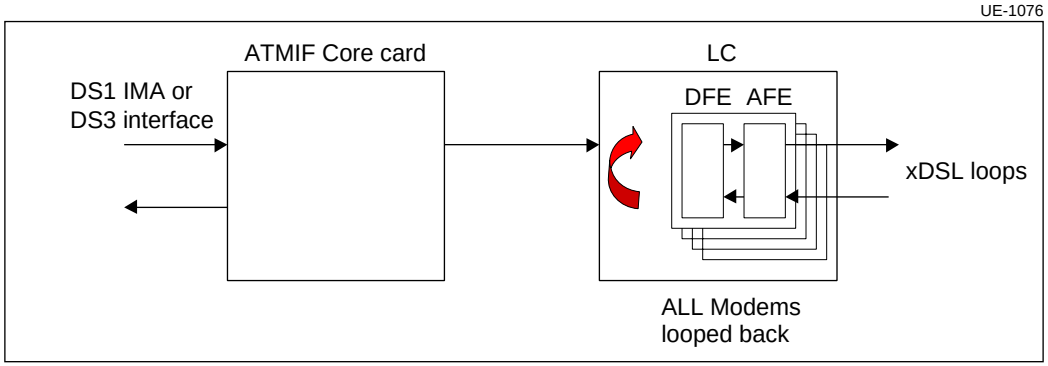
Step	Action
1	From the shelf submap, open the line card pop-up menu and select **Maintenance -> LC -> Loopback -> ATMLoopbackUpstream -> Start** *The line card begins to loop back all ATM cells in the upstream direction.*
2	To stop the test, select: **Maintenance -> LC -> Loopback -> ATMLoopbackUpstream -> Stop**
3	To stop all tests on this line card, select **Maintenance -> LC -> Loopback -> Stop all tests and loopback**

—end—

Procedure 3-2
Performing the ATM loopback downstream test

This test loops ATM cells through the line card back toward the customer premises equipment (CPE). During the test, the ATM card and the backplane circuitry are isolated. You can use this test to verify the CPE, subscriber line, and most of the modem circuitry.

Figure 3-3
ATM loopback downstream test



This test:

- is service affecting for all line circuits on the line card
- runs continuously until manually stopped
- can be run only while the line card is locked
- cannot be run at the same time as the ATM loopback upstream test

Action

Step	Action
1	From the shelf submap, open the line card pop-up menu and select **Maintenance -> ADSL4 -> Lock -> Normal** *The line card is OOS (the symbol is tan and the annotation text is "L")*

—continued—

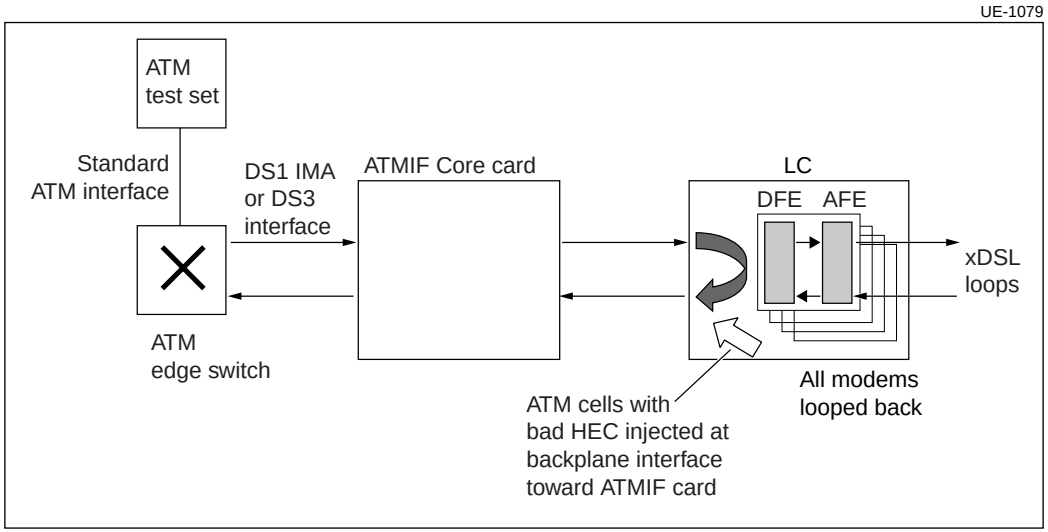
Procedure 3-2 (continued)
Performing the ATM loopback downstream test

Step	Action
2	From the shelf submap, open the line card pop-up menu and select **Maintenance -> ADSL4 -> Loopback -> ATMLoopbackDownstream -> Start** *The line card begins to loop back all ATM cells in the downstream direction.*
3	To stop the test, select: **Maintenance -> ADSL4 -> Loopback -> Stop all tests and loopbacks**
4	To stop all tests on this line card, select **Maintenance -> ADSL4 -> Loopback -> Stop all tests and loopback** *The line card symbol changes color when the equipment is in-service. See the UE9000 Data OAM&P User Guide for more information about visual indicators in uEMS.* **—end—**

Procedure 3-3
Performing the inject bad HEC upstream test

This test injects cells with bad HEC bytes upstream from the line card toward the ATM card. You can use this test to verify the error detection circuitry on the ATM card.

Figure 3-4
Inject bad HEC upstream test



This test:

- is service affecting for all line circuits on the line card
- runs continuously until manually stopped
- can be run while the line card is either locked or unlocked
- can be run at the same time as the ATM loopback upstream test

—continued—

Procedure 3-3 (continued)
Performing the inject bad HEC upstream test

Action

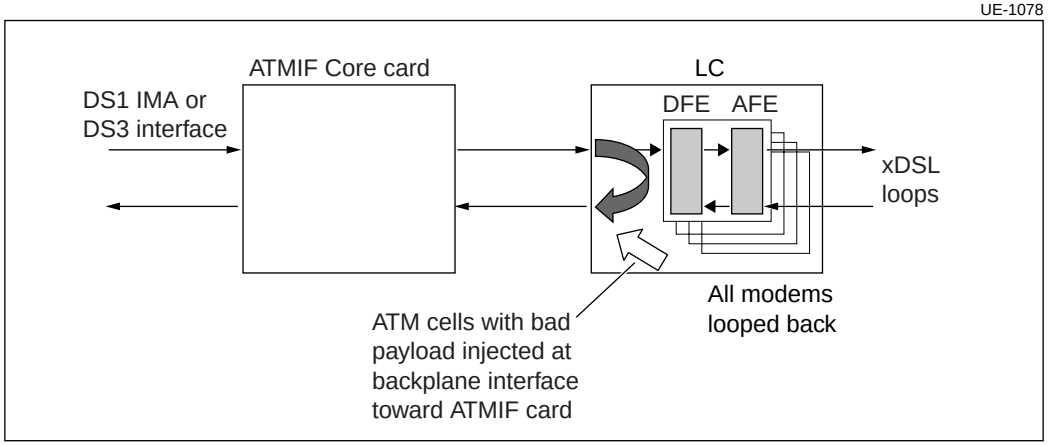
Step	Action
1	From the shelf submap, open the line card pop-up menu and select **Maintenance -> LC -> Test -> InjectBadHECUpstream -> Start** *The line card begins to send cells with bad HEC bytes in the upstream direction.*
2	To stop the test, select: **Maintenance -> LC -> Test -> InjectBadHECUpstream -> Stop**
3	To stop all tests on this line card, select **Maintenance -> LC -> Test -> Stop all tests and loopback**

—end—

Procedure 3-4
Performing the inject bad payload upstream test

This test injects cells with bad ATM cell payload bytes upstream from the line card. You can use this test to verify the error detection circuitry on the ATM card.

Figure 3-5
Inject bad payload upstream test



This test:

- is service affecting for all line circuits on the line card
- runs continuously until manually stopped
- can be run while the line card is either locked or unlocked
- can be run at the same time as the ATM loopback upstream test and the inject bad HEC upstream test

—continued—

Procedure 3-4 (continued)
Performing the inject bad payload upstream test

Action

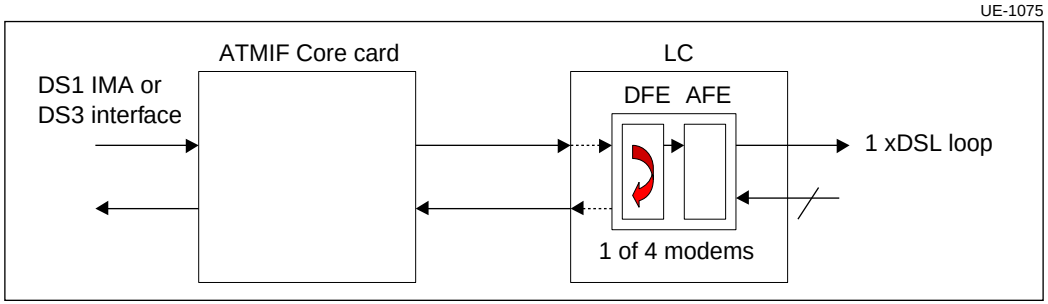
Step	Action
1	From the shelf submap, open the line card pop-up menu and select **Maintenance -> LC -> Test -> InjectBadPayloadUpstream -> Start** *The line card begins to send cells with bad ATM cell payload bytes in the upstream direction.*
2	To stop the test, select **Maintenance -> LC -> Test -> InjectBadPayloadUpstream -> Stop**
3	To stop all tests on this line card, select **Maintenance -> LC -> Test -> Stop all tests and loopback**

—end—

Procedure 3-5
Performing the DMT utopia loopback upstream test

This test loops ATM cells back toward the carrier network interface at the ATM cell interface to the line card modems. You can use this test to verify the line card ATM cell mux/demux and a portion of the modem digital front end. This test also verifies the integrity of the ATM card and the backplane.

Figure 3-6
DMT utopia loopback upstream test



This test:

- is service affecting for all line circuits on the line card
- runs continuously until manually stopped
- can be run only while the circuit is locked
- cannot be run at the same time as any other test

Action

Step	Action
1	From the LC submap, open the circuit pop-up menu and select **Maintenance -> Circuit -> Lock -> Normal** *The circuit is OOS (the symbol is tan and the annotation text is "L")*

—continued—

Procedure 3-5 (continued)
Performing the DMT utopia loopback upstream test

Step	Action
2	From the LC submap, open the circuit pop-up menu and select **Maintenance -> Circuit -> Loopback -> DMT UTOPIA Loopback Upstream -> Start** *The test begins.*
3	To stop the test, select: **Maintenance -> Circuit -> Loopback -> DMT UTOPIA Loopback Upstream -> Stop**
4	From the LC submap, open the circuit pop-up menu and select **Maintenance -> Circuit -> Unlock -> Normal** *The line circuit symbol changes color when the equipment is in-service. See the UE9000 Data OAM&P User Guide for more information about visual indicators in uEMS.* **—end—**

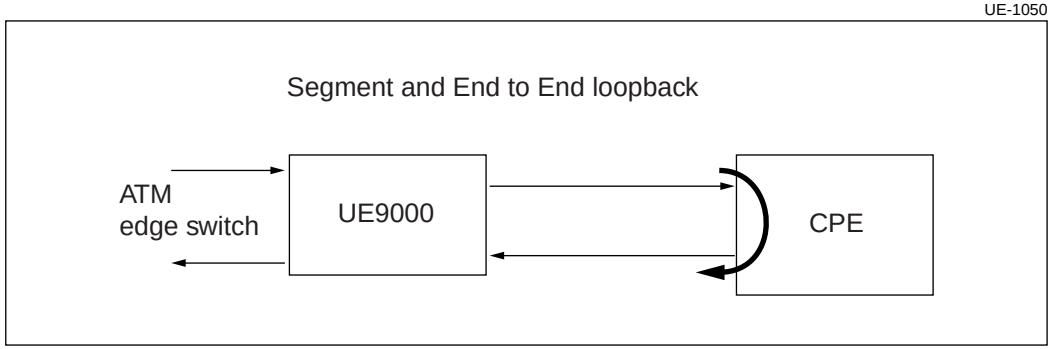
Procedure 3-6
Performing the one-shot loopback test

This test sends an ATM cell either to the next segment end-point (normally the edge switch) or to the final destination node. For the test to be considered successful, the cell must return within 5 seconds.

This test:

- can be received by or originated from the UE9000 shelf
- runs once (not continuously)

Figure 3-7
Access side loopback

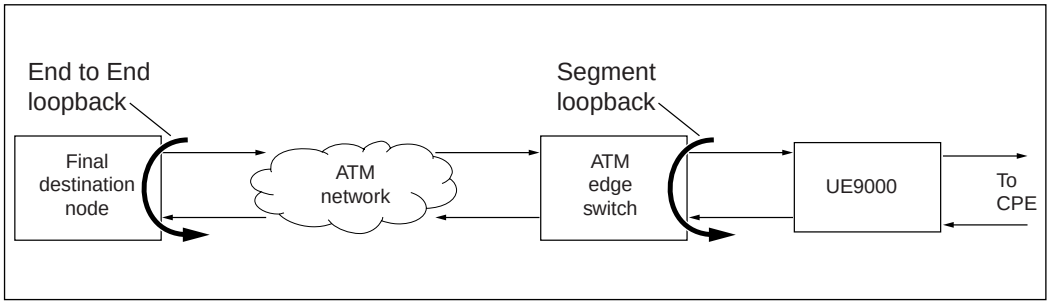


—continued—

Procedure 3-6 (continued)
Performing the one-shot loopback test

Figure 3-8
Network side loopback

UE-1051



Action

Step	Action
1	From the LC submap, open the circuit pop-up menu and select **Maintenance -> VCC -> Test: one shot loopback** *A dialog box appears where you can enter the test parameters.*
2	In the VCC number field, enter a number from **1** to **8**. This number determines which cross-connect is tested.
3	In the Segment or EndtoEnd field, enter **vcSegment** or **vcEnd2End**. This parameter determines whether the test is for the segment or the final destination node.
4	In the Access/Network side field, enter **Access** or **Network**. This parameter determines whether the test is for the subscriber loop (Access side) or the network (Network side).
5	Click OK to start the test. *The test begins. The test results indicate either pass or fail.*

—end—

uEMS faults and events

The procedures in this chapter describe how to clear UE9000 element management system (uEMS) alarms/faults and events.

The events and faults are grouped alphabetically by the event/fault text. Each procedure describes the cause of the event/fault and the action needed to clear it.

> ***Note 1:*** For information on viewing events and interpreting the information in the Events Browser window, see the *UE9000 Data OAM&P User Guide*.
>
> ***Note 2:*** For information on viewing alarms and interpreting the information in the Alarm Browser window, see the *UE9000 Data OAM&P User Guide*.

Chapter contents

This chapter contains the following topics:

This chapter includes the following tasks:

Task	Procedure
Viewing events	Procedure 4-1 on page 4-3
Viewing help for a uEMS event	Procedure 4-2 on page 4-5
Deleting events	Procedure 4-3 on page 4-6

Faults and events in uEMS

Hewlett Packard OpenView (HPOV) and UE9000 element management system (uEMS) use events and faults to indicate the following conditions:

- a threshold limit was exceeded
- the network topology changed
- an informational event or error occurred
- the status of a UE9000 component changed
- the configuration of a UE9000 component changed
- a UE9000 component is restarting

Viewing alarms and events

You can view alarms through the Alarm Browser. For information about the Alarm Browser window, see the *UE9000 Data OAM&P User Guide*.

You can view HPOV and uEMS events through the Event Categories window. The uEMS GUI displays the Event Categories window at start-up along with the Root submap. See the *UE9000 Data OAM&P User Guide* for information about the uEMS Event Categories window.

The button to the left of each event category in the Event Categories window displays the color of the most severe active event for that category. See the *UE9000 Data OAM&P User Guide* for an explanation of each color.

Alarm banner summary

In addition to the Event Categories window, an alarm banner appears automatically when you open the uEMS GUI. The alarm banner shows the total number of faults from the UE9000 device. The alarms are grouped by severity (critical, major, minor, and warning).

To view detailed information about the alarms, click the **Alarm Browser** button.

Procedure 4-1
Viewing events

Use this procedure to view events on the UE9000 element management system (uEMS). See the *UE9000 Data OAM&P User Guide* for a description of the Event Browser.

Interpreting the information in the Event Browser window

For a description of the fields displayed in the Event Browser window, see the Hewlett Packard OpenView documentation.

The following is an example of an event in the Event Browser window:

```
Ack Severity Date/Time Source Message
Normal Tue July 14 16:59:07 NE.01/SHELF.UE1/DAC.A Dac Status
Changed::New st
```

Event severity

For an explanation of event severity, see the *UE9000 Data OAM&P User Guide*.

Action

Step	Action
	Viewing events from the Event Categories window
1	In the Event Categories window, click the button to the left of the Nortel uEMS Events category. *The Event Browser window appears with a list of the events for that category.*
2	In the Event Browser window, double-click the event you want to see. *The submap where the event occurred appears. The UE9000 component that is the source of the event is highlighted in the submap.*

—continued—

Procedure 4-1 (continued)
Viewing events

Step	Action
	Viewing events from a submap
3	In the appropriate submap, highlight the UE9000 component's symbol that you want to see events for.
4	From the Fault pull-down menu, select **Events**. *The Event Browser window displays a listing of all the events for the selected UE9000 component.*

—end—

Procedure 4-2
Viewing help for a uEMS event

Use this procedure to view detailed information about events.

Note: Some events require no action. Those events are not included in this book.

Action

Step	Action
1	In the Event Browser window, highlight the event for which you want more information.
2	From the View pull-down menu, select **Describe Event**. *The Describe Event dialog appears. The cause of the event is displayed in the Event Description field.*
3	When you are finished using the Describe Event dialog, press the **Close** button.

—end—

Procedure 4-3
Deleting events

The uEMS GUI saves all events until one of the following actions occurs:

- the hard disk becomes full
- one or more events are deleted

Action

Step	Action
1	To delete an event, highlight the event in the Event Browser window and select **Delete** -> **Selected Events** from the Actions pull-down menu.

—end—

uEMS events

Table 4-1 lists each event and a cause and solution for each.

Table 4-1
uEMS events

Event	Solution
Carrier Config Failed Severity: Critical Cause: The uEMS has failed an attempt to send provisioning data to the DS1 or DS3 carrier.	• Check and verify that the information that was provisioned is correct and consistent. • Select **Misc->Nortel uEMS->Carrier Force Synchronize** from the uEMS GUI to force the uEMS to retry pushing the shelf information to the shelf. • If the above fails, perform the following commands from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". > **/opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.
Carrier Fault Occurred Severity: Depends on the nature of the fault Cause: A fault has occurred on a DS1 carrier.	• Resolve the problem with the carrier. See Chapter 1, "Troubleshooting," for troubleshooting information.
—continued—	

Table 4-1 (continued)
uEMS events

Event	Solution
Carrier Test Complete Failed Severity: Critical Cause: A test attempt has failed on the DS1 carrier.	• Resolve the problem with the carrier and then retest. See Chapter 1, "Troubleshooting," for troubleshooting information.
Carrier Threshold Exceeded Severity: Major Cause: A threshold is exceeded on a DS1 carrier.	• Investigate why this threshold has been exceeded. • If desired, reprovision the threshold value to a different value. See the *UE9000 Data OAM&P User Guide* for information on using the uEMS command line user interface (CLUI).
Cct Config Failed Severity: Critical Cause: The uEMS has failed an attempt to send provisioning data to an xDSL circuit.	• Check and verify that the information that was provisioned is correct and consistent. • Select **Misc->Nortel uEMS->Cct Force Synchronize** from the uEMS GUI to force the uEMS to retry pushing the shelf information to the shelf. • If the above fails, perform the following commands from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Cct Fault Occurred Severity: Depends on the nature of the fault Cause: A fault has occurred on an xDSL subscriber circuit.	• See "Line card and circuit faults" on page 4-28.
Cct Test Complete Failed Severity: Critical Cause: A test attempt has failed on an xDSL circuit.	• Resolve the problem with the circuit and then retest. See Chapter 1, "Troubleshooting," for troubleshooting information.
Cct Threshold Exceeded Severity: Major Cause: A threshold is exceeded on an xDSL circuit.	• Investigate why this threshold has been exceeded. • If desired, reprovision the threshold value to a different value. See the *UE9000 Data OAM&P User Guide* for information on using the uEMS command line user interface (CLUI).
—continued—	

Table 4-1 (continued)
uEMS events

Event	Solution
Dac Config Failed Severity: Critical Cause: The uEMS has failed an attempt to send provisioning data to the ATM card.	• Check and verify that the information that was provisioned is correct and consistent. • Select **Misc->Nortel uEMS->DAC Force Synchronize** from the uEMS GUI to force the uEMS to retry pushing the shelf information to the shelf. • If the above fails, perform the following commands from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.
Dac Diff. Active/stby Current Loads Severity: Minor Cause: The DAC A and DAC B DS3 ATM card software loads do not match	• Check which is the proper software load and update the load on the incorrect DS3 ATM core card.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Dac Diff. Prov. & Current Loads Severity: Minor Cause: The provisioned Atmif software loads does not match the current Atmif load.	• Upgrade the ATM card's provisioned load. See Procedure 2-10, "Upgrading the firmware" on page 2-23.
Dac Down Severity: Major Cause: Communication is interrupted between the uEMS and the ATM card	• Verify that the Data-Access-Card is not undergoing a restart. • Select **Fault->Nortel uEMS->verifyComm** to determine if the Data-Access-Card is responding to SNMP messages from the uEMS. • Select **Fault->Ping** to determine if the Data-Access-Card is responding to IP messages from the uEMS. If it is not responding, perform a ping between various nodes in the network. To determine which portion of the path is faulty, ping nodes which are along the uEMS to DAC communications path.
Dac Events Lost Severity: Warning Cause: The ATM card has lost events due to buffer overflow. The uEMS attempts to recreate lost events.	The DAC buffers every event that it generates. When the uEMS receives and acknowledges an event, the DAC removes that event from its buffers. If the uEMS does not acknowledge these events quickly enough, the DAC buffers may overflow and these and all subsequent events are lost. This condition is likely to occur when communications between the uEMS and DAC is down or the rate of generated events is very high. Even though this event is generated, the uEMS attempts to re-create events that were lost. If, for instance, a line card had changed state more than once, then the uEMS only re-creates the event for the last state change.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Dac Fault Occurred Severity: Depends on the nature of the fault Cause: A fault has occurred on an ATM card	• Resolve the problem with the ATM card. See Chapter 1, "Troubleshooting," for troubleshooting information.
Dac Hardware Mismatch Severity: Major Cause: The ATM card type does not match what is provisioned on the uEMS	• Check and verify that the information that was provisioned is correct and consistent.
Dac Hardware Removed Severity: Warning Cause: The ATM card is removed.	This event is only generated if the uEMS has lost communications with a Data-Access-Card for at least a specific length of time. This length of time is configurable via HP OpenView. The most common occurrence is when a Data-Access-Card is removed.
—continued—	

Table 4-1 (continued)
uEMS events

Event	Solution
Dac Restart Complete Failed Severity: Critical Cause: A restart attempt has failed on an ATM card.	• Check and verify that the load name that was provisioned is correct. • Select **Misc->Nortel uEMS->DAC Force Synchronize** from the uEMS GUI to force the uEMS to retry pushing the shelf information to the shelf. • If the above fails, perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • Re-issue the restart operation. Consider doing a hardware reset. • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.
Dac Test Complete Failed Severity: Critical Cause: A test attempt has failed on an ATM card.	• Resolve the problem with the ATM card and then retest. See Chapter 1, “Troubleshooting,” for troubleshooting information.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Dac Threshold Exceeded Severity: Major Cause: A threshold is exceeded on an ATM card.	• Investigate why this threshold has been exceeded. • If desired, reprovision the threshold value to a different value. See the *UE9000 Data OAM&P User Guide* for information on using the uEMS command line user interface (CLUI).
Dac Unknown but Received Severity: Warning Cause: The uEMS has received an event from an ATM card that is not provisioned on the uEMS.	This condition may occur if a DAC is unprovisioned on the uEMS but the DAC is not removed. In particular, this would occur if communications between the uEMS and DAC was down at the time of the unprovision operation.
—continued—	

Table 4-1 (continued)
uEMS events

Event	Solution
Db Error Severity: Major Cause: The uEMS has detected an error in the uEMS database.	This event is generated by the uEMS to provide error messages about the uEMS database. This event indicates that the uEMS database may be corrupted or is in an unexpected state. • Perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • Perform the following command to view the uEMS database information for the given object to see if there is any obvious corruption: - > /opt/OV/bin/ovobjprint -s [Selection Name] • If possible, unprovision and then re-provision the given object. • If the database is corrupted, consider restoring the uEMS database. The database is in this directory: **/var/opt/OV/share/databases/openview/ovwdb/current** - See the *UE9000 Data OAM&P User Guide* for information about backing up and restoring databases. • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Db Timeout Severity: Major Cause: The uEMS database subsystem is not responding.	• Perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". In particular, ensure that "ovwdb" has no error messages reported against it. **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.
Db Warning Severity: Warning Cause: The uEMS has detected a condition that could lead to a database error.	This event is generated by the uEMS to provide warning messages about the uEMS database. This event highlights uEMS database conditions that indicate a possible or potential problem. • Observe the warning message to avoid potential problems.
—continued—	

Table 4-1 (continued)
uEMS events

Event	Solution
Lc Config Failed Severity: Critical Cause: The uEMS has failed an attempt to send provisioning data to an xDSL MLC.	• Check and verify that the information that was provisioned is correct and consistent. • Select **Misc->Nortel uEMS->Lc Force Synchronize** from the uEMS GUI to force the uEMS to retry pushing the shelf information to the shelf. • If the above fails, perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.
Lc Fault Occurred Severity: Depends on the nature of the fault Cause: A fault has occurred on an xDSL MLC.	• See “Line card and circuit faults” on page 4-28.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Lc Hardware Mismatch Severity: Critical Cause: The xDSL card type does not match what is provisioned on uEMS.	This event is generated when the type of a line card does not match what is provisioned on the uEMS. • Check and verify that the information that was provisioned is correct and consistent.
Lc Hardware Removed Severity: Minor Cause: The xDSL card is removed.	This event is generated when a line card is removed. • Replace the line card.
Lc Restart Complete Failed	• Check and verify that the load name that was provisioned is correct and consistent. • Perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • Reissue the restart operation. Consider doing a hardware reset. • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.
Lc Test Complete Failed	• Resolve the problem with the line card and then retest. See Chapter 1, “Troubleshooting,” for troubleshooting information.
—continued—	

Table 4-1 (continued)
uEMS events

Event	Solution
NE Fault Occurred	• Resolve the problem with the NE. See Chapter 1, "Troubleshooting," for troubleshooting information. Also refer to the *UE9000 Voice OAM&P User Guide*.
NV Store Config Failed	• Send Update Recovery Data with Reboot. See Procedure 2-7, "Updating Recovery Data" on page 2-17.
NV Store Download Failed	• Retry Update Recovery Data (see Procedure 2-7, "Updating Recovery Data" on page 2-17) • Check to make sure the file size is less than 750 kB (file located in **/etc/opt/OV/share/conf/Nortel/HSTP/uems/nvstore**)
Shelf Config Failed	• Check and verify that the information that was provisioned is correct and consistent. • Select **Misc->Nortel uEMS->Shelf Force Synchronize** from the uEMS GUI to force the uEMS to retry pushing the shelf information to the shelf. • If the above fails, perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
Shelf Fault Occurred	• Resolve the problem with the shelf. See Chapter 1, "Troubleshooting," for troubleshooting information.
Shelf Restart Complete Failed	• Check and verify that the load name that was provisioned is correct. • Perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • Re-issue the restart operation. Consider doing a hardware reset. • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint**. - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf.

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
SNMP Error	• Perform the following command from the prompt (you need root-access privilege to do this): - Inspect output from ovstatus and ensure that for all, "state:" is "RUNNING". **> /opt/OV/bin/ovstatus** - If hstpmon is not RUNNING, then perform the following: **> /opt/OV/bin/ovstop** **> /opt/OV/bin/ovstart** • Perform the following command and verify that SNMP is configured appropriately: - > /opt/OV/bin/xnmsnmpconf • If the problem persists, contact Technical Support and provide them with the following information: - The output generated from the command **/opt/OV/bin/ovobjprint** - The file /var/opt/OV/share/log/trapd.log. - The file /var/opt/OV/share/log/Nortel/HSTP/hstpmon -<username>.log. - The file /var/adm/syslog/syslog.log. - The output from **Help->Nortel uEMS->About uEMS**. - The version of the software running on the cards in the shelf. - The output from the command **/opt/OV/bin/xnmsnmpconf -dumpCache**

—continued—

Table 4-1 (continued)
uEMS events

Event	Solution
SNMP Timeout	A time-out is caused because of one of the following reasons: • The timeout value is configured too small. - User Action: This value may be increased by selecting **Options -> SNMP Configuration** • The network between the uEMS and the DAC was down. - User Action: Verify if the uEMS has IP-connectivity to the DAC by selecting **Fault -> Ping**. • The SNMP community string configured on the DAC is different from that configured on the uEMS. When this event occurs, the uEMS should also have received an SNMP_Authen_Failure event from the DAC. - User Action: Contact your next level of support.
SNMP Warning	This event highlights SNMP protocol conditions that indicate a possible or potential problem. • Resolve the problem with SNMP communications. See Chapter 1, “Troubleshooting,” for troubleshooting information.
SWACT failure	• Make sure “standby” DS3 ATM card is up and running • Make sure “standby” DS3 ATM card is in the correct state • Make sure “standby” DS3 ATM card is unlocked • Make sure the DS3 carrier link is working
/var partition n% full	The purpose for this event is to generate a message that the disk space is nearly full. The severity for this event varies depending on the following thresholds: Minor event = disk space is between 80% and 89% full Major event = disk space is between 90% and 94% full Critical event = disk space is between 95% and 97% full ***Note:*** In this case, a warning appears, indicating that log files will be deleted when disk space becomes 98% full. Critical event = disk space is between 98% and 100% full ***Note:*** In this case, a warning appears, indicating that log files will be deleted to avoid possible database corruption.
—end—	

Threshold events

Table 4-2 lists the circuit threshold types. The UE9000 equipment generates threshold events when certain parameters exceed the configured threshold value.

Table 4-2
Circuit threshold types

Type	Description
atucfeci	forward error correction anomalies on the interleaved channel counted by the near-end modem
atuccrci	cyclical redundancy check (CRC) anomalies on the interleaved channel counted by the near-end modem
atucheci	header error check failures on the interleaved channel counted by the near-end modem
atuclcdi	loss of cell delineation failures on the interleaved channel counted by the near-end modem
aturfeci	forward error correction anomalies on the interleaved channel counted by the far-end modem
aturheci	header error check failures on the interleaved channel counted by the far-end modem
aturlcdi	loss of cell delineation failures on the interleaved channel counted by the far-end modem
aturblockErrori	CRC anomalies on the interleaved channel detected at the far-end equipment and reported back to the near-end equipment
adslAtucThresh15MinFailedFastR	This threshold crossing is sent when the number of failed fast retrains is exceeded for the current 15-minute window
adslAtucThresh15MinLofs	near-end loss of frame defects for the current 15-minute window
adslAtucThresh15MinLoss	near-end loss of signal defects for the current 15-minute window
—continued—	

Table 4-2 (continued)
Circuit threshold types

Type	Description
adslAtucThresh15MinLols	near-end loss of link defects for the current 15-minute window
adslAtucThresh15MinLprs	near-end loss of power defects for the current 15-minute window
adslAtucThresh15MinESs	near-end errored seconds for the current 15-minute window
adslAtucInitFailureTrapEnable	near-end unsuccessful line initialization attempts
adslAturThresh15MinLofs	far-end loss of frame defects for the current 15-minute window
adslAturThresh15MinLoss	far-end loss of signal defects for the current 15-minute window
adslAturThresh15MinLols	far-end loss of link defects for the current 15-minute window
adslAturThresh15MinLprs	far-end loss of power defects for the current 15-minute window
—end—	

Table 4-3 lists the DS1 carrier threshold types. The UE9000 equipment generates threshold events when certain parameters exceed the configured threshold value.

Table 4-3
DS1 carrier threshold types

Type	Description
pvc	path coding violations
es	error seconds
ses	severely errored seconds
sefs	severely errored framing seconds
—continued—	

Table 4-3 (continued)
DS1 carrier threshold types

Type	Description
uas	unavailable seconds
pcvFe	path coding violations - far end
esFe	error seconds - far end
sesFe	severely errored seconds - far end
sefsFe	severely errored framing seconds - far end
uasFe	unavailable seconds - far end
lcv	line code violations
les	line errored seconds
lesFe	line errored seconds - far end
fcGrp	failure count - IMA group
fcGrpFe	failure count - IMA group - far end
uasGrp	unavailable seconds - IMA group
ivIma	ICP violations - IMA group
sesIma	severely errored seconds - IMA link
uasIma	unavailable seconds - IMA link
txUusIma	transmit unusable seconds - IMA link
rxUusIma	receive unusable seconds - IMA link
txFc	transmit link failure alarm conditions - IMA link
rxFc	receive link failure alarm conditions - IMA link
oifIma	OIF anomalies - IMA link
txStuffIma	stuffing events in transmit direction - IMA link
rxStuffIma	stuffing events is receive direction - IMA link
sesImaFe	severely errored seconds - IMA link - far end

—continued—

Table 4-3 (continued)
DS1 carrier threshold types

Type	Description
uasImaFe	unavailable seconds - IMA link - far end
txUusImaFe	transmit unusable seconds - IMA link - far end
rxUusImaFe	receive unusable seconds - IMA link - far end
txFcFe	transmit link failure alarm conditions - IMA link - far end
rxFcFe	receive link failure alarm conditions - IMA link - far end
—end—	

Table 4-4 lists the DS3 carrier threshold types. The UE9000 equipment generates threshold events when certain parameters exceed the configured threshold value.

Table 4-4
DS3 carrier threshold types

Type	Description
pes	P-bit errored seconds
pses	P-bit severely errored seconds
sefs	P-bit severely error framing seconds
uas	unavailable seconds
lcv	line code violation
pcv	P-bit code violation
les	line errored seconds
ccv	C-bit coding violation
ces	C-bit errored seconds
cses	C-bit severely errored seconds
feces	far end C-bit errored seconds
fecses	far-end C-bit severely errored seconds
—continued—	

Table 4-4 (continued)
DS3 carrier threshold types

Type	Description
feccv	far end C-bit coding violation
feuas	far end unavailable seconds
—end—	

Line card and circuit faults

Each ADSL multi-circuit line card (MLC) reports faults to the ATM card. As shown in Table 4-5 and Table 4-6, there are different faults that are associated with an individual circuit or with an entire MLC.

Note: For clearing carrier faults, refer to the *AccessNode Alarm and Trouble Clearing Procedures, 323-3001-543, in Volume 5A: Maintenance*.

Table 4-5
ADSL line circuit faults

Equipment	Fault
ATU-C	ATU-C failure on page 4-30
	ATU-R not present on page 4-32 (see Note)
	Downstream cells dropped on page 4-33
	Loss of cell delineation — interleave channel on page 4-35
	Loss of frame on page 4-37 (see Note)
	Loss of link on page 4-39 (see Note)
	Loss of power on page 4-41 (see Note)
	Loss of signal on page 4-43 (see Note)
	Modem ATU-C clock failure on page 4-45
	Non-zero VPI bits on page 4-46
ATU-R	Incompatible Tx mode on page 4-50
	Loss of cell delineation — interleave channel on page 4-52
	Loss of frame on page 4-54 (see Note)
	Loss of link on page 4-56 (see Note)
	Loss of power on page 4-58 (see Note)
	Loss of signal on page 4-59 (see Note)
Modem	Modem training failure on page 4-48
Note: This fault is not displayed in the Alarm Browser. To see this fault, right-click the CPE symbol on the Subscriber loop submap, and select **Show -> Faults**.	

Table 4-6
ADSL line card faults

Equipment	Fault
ATM50	DS FIFO overrun on page 4-61
	DS HEC failure on page 4-62
	Line signal fault on page 4-63
ATM	Lost communication to ATMIF on page 4-65
ATM, line card, circuit, carrier	Config. failure on page 4-67
ATM, line card	Firmware mismatch on page 4-68
	Hardware mismatch on page 4-69
Line card	In service LC removed on page 4-70

Severity levels

Each fault has one of the following three severity levels:

- **Minor** — generally either self-correctable or link-related. Corrective actions for these faults include reestablishing a link or waiting for the fault to clear. Some minor faults are hardware related and require operator intervention.
- **Major** — indicate that a service affecting condition has developed and an urgent action is required. This severity level can occur, for example, when there is a severe degradation in the capability of the managed object. In this case, the object's full capability must be restored.
- **Critical** — indicate that a service affecting condition has occurred and an immediate corrective action is required. This severity level can occur, for example, when a managed object becomes totally out of service. In this case, the object's full capability must be restored.

ATU-C
ATU-C failure

Probable cause

This fault occurs when there has been a critical modem failure. These are the types of failures that may occur:

- modem not responding
- modem in Kernel mode
- modem download failure
- modem message corrupted

Severity

This is a minor fault.

Action

Step	Action

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card can drop all voice and data service for five to eight minutes.

1 Restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.

—continued—

ATU-C
ATU-C failure (continued)

Step	Action
2	If the fault remains, replace the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit. **—end—**

ATU-C
ATU-R not present

Probable cause

This fault occurs when the ATU-C cannot detect the customer premises equipment (CPE).

The most common cause for this fault is that the CPE has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Ensure that the CPE is turned on and the phone cord is plugged in.
2	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

3	If the fault remains, replace the CPE or the line card.

—end—

ATU-C
Downstream cells dropped

Probable cause

This fault occurs when the downstream modem interface port for the affected circuit has stopped accepting cells for 2.5 seconds. When this fault is present, the affected subscriber is not receiving downstream data.

The line card clears this fault after 10 seconds of normal operation.

Severity

This is a minor fault.

Action

Step	Action
1	Wait about 5 minutes while the system attempts to re-establish the link. If it is successful, the fault clears automatically.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card can drop all voice and data service for five to eight minutes.

—continued—

ATU-C

Downstream cells dropped (continued)

Step	Action
2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.
3	If the fault remains, replace the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit. **—end—**

ATU-C
Loss of cell delineation — interleave channel

Probable cause

This fault occurs when the line card detects 2.5 seconds of LCD-I defects at the ATU-C. This fault indicates a loss of synchronization of ATM cells in the upstream interleave channel. When this fault is present, the affected circuit is not receiving any valid upstream data in the interleave channel.

The line card clears the fault after 10 seconds without an LCD-I defect at the ATU-C.

Severity

This is a minor fault.

Action

Step	Action
1	Wait about 5 minutes while the system attempts to re-establish the link. If it is successful, the fault clears automatically.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card can drop all voice and data service for five to eight minutes.

—continued—

ATU-C

Loss of cell delineation — interleave channel (continued)

Step	Action
2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.
3	If the fault remains, replace the CPE or the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit. **—end—**

ATU-C
Loss of frame

Probable cause

This fault occurs when the line card detects 2.5 seconds of contiguous severely errored frame (SEF) defects and there is no loss of signal (LOS) defect or fault.

The line card clears this fault when an ATU-C LOS fault occurs or when no SEF defects occur on an active link for 10 seconds.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

ATU-C
Loss of frame (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4	If the fault remains, replace the CPE or the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

ATU-C
Loss of link

Probable cause

This fault occurs in the following instances:

- An ATU-C loss of signal (LOS) fault occurred (see "Loss of signal" on page 4-43) and was not preceded by an ATU-R loss of power fault.
- An ATU-C loss of frame (LOF) fault occurred (see "Loss of frame" on page 4-37).
- No ATU-C LOS or LOF fault is present and near-end CRC errors in the last 256 second sample exceeded the threshold, indicating a loss of signal quality. This condition indicates that the subscriber loop is being subjected to severe loop impairments in the upstream direction.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

ATU-C
Loss of link (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4	If the fault remains, replace the CPE or the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

ATU-C
Loss of power

Probable cause

This fault occurs when the ATU-C electrical supply power drops to a level below the pre-determined minimum power level required to ensure proper operation. The line card clears this fault after 10 seconds of normal power level on the ATU-C.

Severity

This is a minor fault.

Action

Step	Action

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card will not restore voice and data traffic for five to eight minutes.

—continued—

ATU-C
Loss of power (continued)

Step	Action

1 Restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.

DANGER
Risk of electric shock
Observe normal safety precautions when working near or on the power supply.

CAUTION
Loss of service
You must wait more than five seconds to reapply power. If you do not wait more than five seconds, the line card will not restore voice and data traffic for five to eight minutes.

2 If the problem still exists, investigate the shelf and line card power supplies. Are they operating normally?

If	Then
yes	Go to step 3.
no	Repair or replace the power supply.

3 Are all the modems on the line card functioning properly?

If	Then
yes	Contact your next level of technical support.
no	Replace the line card.

—end—

ATU-C
Loss of signal

Probable cause

This fault occurs when the line card detects 2.5 seconds of loss of signal (LOS) defects. This fault may also occur if a LOS defect is present when the criteria for a loss of frame fault have been met. A line circuit reports a LOS defect when the received xDSL pilot tone power has fallen below the threshold. The threshold is set at 6 dB below the reference power.

The line card clears this fault when no LOS defects occur on an active link for 10 seconds.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

ATU-C
Loss of signal (continued)

Step	Action

3 Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4 If the fault remains, move the subscriber to another line circuit. Does the fault reoccur?

If	Then
yes	The problem is in the line circuit. Replace the line card.
no	The problem is in the subscriber loop or CPE. Replace the CPE.

—end—

ATU-C
Modem ATU-C clock failure

Probable cause

This fault occurs when the DMT clock on the line card is not functioning correctly. When this condition is present, the ATU-C modem cannot link with the ATU-R.

Severity

This is a minor fault.

Action

Step	Action
1	Restart the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

2	If the fault remains, replace the line card.

—end—

ATU-C
Non-zero VPI bits

Probable cause

This fault occurs when the upstream modem interface port for the affected circuit has received non-zero virtual path identifier (VPI) bits for 2.5 seconds. When this fault is present, the port is dropping all upstream traffic for the affected subscriber.

The line card clears this fault after 10 seconds of normal operation.

Severity

This is a minor fault.

Action

Step	Action
1	Wait about 5 minutes while the system attempts to re-establish the link. If it is successful, the fault clears automatically.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card will not restore voice and data traffic for five to eight minutes.

2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.

—continued—

ATU-C
Non-zero VPI bits (continued)

Step	Action
3	If the fault remains, replace the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit. **—end—**

Modem
Modem training failure

Probable cause

This fault occurs when the link between ATU-C and ATU-R or STU-C and STU-R fails to establish a link on three consecutive attempts. This fault occurs in one of the following instances:

- data error
- configuration error
- protocol error
- initialization error

The line card clears this fault immediately after a link is successfully established between the ATU-C and ATU-R or the STU-C and STU-R.

Severity

This is a minor fault.

Action

Step	Action
1	Wait about 5 minutes while the system attempts to re-establish the link. If it is successful, the fault clears automatically.
2	If the fault remains, change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

—continued—

Modem

Modem training failure (continued)

Step	Action
3	If the fault remains, replace the CPE or the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit. **—end—**

ATU-R
Incompatible Tx mode

Probable cause

This fault occurs when the provisioned service for a circuit is incompatible with the transmission mode of the CPE. For example, if you plug a G.Lite CPE into a circuit that has been provisioned for T1.413 only, this fault is generated. When the fault is present, the link will never train (i.e. the subscriber has no service) because the transmission mode is incompatible. To correct this situation, perform *ONE* of the following subprocedures.

Either the CPE must be replaced with a CPE that supports the provisioned transmission mode for that circuit, or the provisioned transmission mode for the circuit must be changed to a mode that is compatible with the CPE.

Severity

This is a minor fault.

Action

Step	Action
	Replace or move the CPE
1	Replace the CPE with a CPE that supports the provisioned transmission mode for that circuit.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

—continued—

ATU-R
Incompatible Tx mode (continued)

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card will not restore voice and data traffic for five to eight minutes.

Changing the provisioned transmission mode

2 Change the ADSL circuit enabling drop down menu option in the **Provision/Edit** dialog box for a circuit.

Note: ADSL circuit enabling of auto detect will allow training in any mode which should always clear this fault.

Once the transmission mode has been changed to a mode that is compatible with the CPE, the link should train and the fault should clear.

—end—

ATU-R
Loss of cell delineation — interleave channel

Probable cause

This fault occurs when the line card detects 2.5 seconds of LCD-I defects at the ATU-R. This fault indicates a loss of synchronization of ATM cells in the downstream interleave channel. When this fault is present, the affected circuit is not receiving any valid downstream data in the interleave channel.

The line card clears the fault after 10 seconds without an LCD-I defect at the ATU-R.

Severity

This is a minor fault.

Action

Step	Action
1	Wait about 5 minutes while the system attempts to re-establish the link. If it is successful, the fault clears automatically.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
You must wait more than five seconds to reinsert a line card after removing the line card from the shelf to reseat it. If you do not wait more than five seconds, the line card will not restore voice and data traffic for five to eight minutes

—continued—

ATU-R

Loss of cell delineation — interleave channel (continued)

Step	Action
2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.
3	If the fault remains, replace the CPE or the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit. **—end—**

ATU-R
Loss of frame

Probable cause

This fault occurs when the line card detects 2.5 seconds of contiguous remote defect indication (RDI) and there is no far-end LOS defect or fault. An RDI defect is a severely errored frame defect that the line card detects at the far end. The line card clears this fault when a far-end loss of signal fault occurs or when no RDI defects occur on an active link for 10 seconds.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

ATU-R
Loss of frame (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4 If the fault remains, replace the CPE or the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

ATU-R
Loss of link

Probable cause

This fault occurs in the following instances:

- An ATU-R loss of signal (LOS) fault occurred (see "Loss of signal" on page 4-59)
- An ATU-R loss of frame (LOF) fault occurred (see "Loss of frame" on page 4-54)
- An ATU-R loss of power fault occurred (see "Loss of power" on page 4-58)
- No ATU-R LOS or LOF fault is present and far-end CRC errors in the last 256 second sample exceeded the threshold, indicating a loss of signal quality. This condition indicates that the subscriber loop is being subjected to severe loop impairments in the downstream direction.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

ATU-R
Loss of link (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4	If the fault remains, replace the CPE or the line card. ***Note:*** This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

ATU-R
Loss of power

Probable cause

This fault occurs when the line card detects a far-end loss of power fault followed by 2.5 seconds of contiguous near-end LOS defects. The line card clears this fault when no near-end loss of signal (LOS) defects occur for 10 seconds.

Severity

This is a minor fault.

Action

No action is required. The customer premises equipment may send this fault when power is removed. It is a normal power off condition.

Note: Some customer premises equipment may not send this signal on power off.

—end—

ATU-R
Loss of signal

Probable cause

This fault occurs when the line card detects 2.5 seconds of loss of signal (LOS) defects. This fault may also occur if a far-end LOS defect is present when the criteria for a loss of frame fault have been met. A line circuit reports a LOS defect when the received ADSL pilot tone power has fallen below the threshold. The threshold is set at 6 dB below the reference power.

The line card clears this fault when no LOS defects occur on an active link for 10 seconds.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

ATU-R
Loss of signal (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4	If the fault remains, replace the CPE or the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

ATM50
DS FIFO overrun

Probable cause

The fault occurs when the FIFO buffer in the ATM50 chip set for an xDSL circuit has repeatedly overrun for 2.5 seconds. When this fault is present, the line card is dropping some or all downstream cells.

The line card clears this fault after 10 seconds without a FIFO overrun.

Severity

This is a major fault.

Action

Step	Action
1	Wait about 5 minutes while the system flushes the FIFO buffer. If the fault condition stops, the fault clears automatically.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
After removing the line card from the shelf, you must wait more than five seconds before you reinsert the line card. If you do not wait more than five seconds to reinsert the card, the line card can drop all voice and data service for five to eight minutes.

2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.
3	If the fault remains, replace the line card.

—end—

ATM50
DS HEC failure

Probable cause

The fault occurs when the ATM50 chip set for an xDSL circuit detects HEC errors continuously for 2.5 seconds in the downstream data. When this fault is present, the downstream data to the line card from the line card is severely corrupted. The line card clears this fault after 10 seconds without any HEC errors.

Severity

This is a major fault.

Action

Step	Action
1	Wait about 5 minutes for the fault condition to clear.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
You must wait more than five seconds to reinsert a line card after removing the line card from the shelf to reseat it. If you do not wait more than five seconds, the line card can drop all voice and data service for five to eight minutes.

2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.
3	If the fault remains, replace the line card.
4	If the fault remains, check the ATM card and the backplane.

—end—

ATM50
Line signal fault

Probable cause

This fault occurs when the ATM line between the xDSL line card and the ATM card does not function properly for 2.5 seconds. When this fault is present, the line card is not receiving any downstream data and is not sending any upstream data.

The line card clears this fault after 10 seconds of normal operation.

Severity

This is a critical fault.

Action

Step	Action
1	Wait about 5 minutes while the line card attempts to re-establish an ATM connection with the ATM card. If it is successful, the fault clears automatically.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
You must wait more than five seconds to reinsert a line card after removing the line card from the shelf to reseat it. If you do not wait more than five seconds, the line card can drop all voice and data service for five to eight minutes.

—continued—

ATM50
Line signal fault (continued)

Step	Action
2	If the fault remains, restart or reseat the line card. For information on restarting the line card, see Procedure 2-9 on page 2-20.
3	If the fault remains, replace the line card.
4	If the fault remains, check the ATM card and the backplane.

—end—

ATM
Lost communication to ATMIF

Probable cause

This fault occurs when the uEMS workstation cannot communicate with the ATMIF card. When this fault occurs, uEMS may not receive reports of alarms. This alarm could be a transient condition caused by either network congestion or a reboot of the ATMIF. If the cause is transient, the alarm will automatically clear within 10 minutes.

Severity

This is a critical fault.

Action

Step	Action
1	From the GUI, select the ATMIF icon. then **Fault -> Nortel uEMS verify Comm** *This may clear a transient fault.* ***Note:*** If the verify Comm tool does not return a pop-up window with the results of the check, wait 10 seconds, and try again.
2	Use a null modem cable to connect the ATM core card's serial port to a PC, or connect to the ATM (DS3) card's 10BaseT Ethernet port and telnet to the port IP address.
3	Run hyperterm on the PC with this setting: **19200 baud, 1 stop bit, no parity**

—continued—

Procedure 4-3 (continued)
Lost communication to ATMIF

Step	Action
4	For DS1 IMA ATM core card: from the hyperterm window, press the return key a few times. *The hyperterm window should display the "dSH>" prompt.* For DS3 ATM core card: from the TL1> prompt, type: **dsh;** *The "dSH>" prompt appears.*

If	Then
you get the "dSH>" prompt	check the router and ATM edge switch that are in the communication path between the ATMIF card and the uEMS workstation. If you cannot find any problem in this path, call Nortel Networks Technical Support.
the "dSH>" prompt does not display	wait two minutes in case the card is rebooting, then repeat step 4 again. If there is still no response, reseat the ATMIF and repeat step 1 through step 4. If there is no improvement in the situation, you will need to replace the ATMIF card.

—end—

ATM, line card, circuit, carrier
Config. failure

Probable cause

This fault occurs when uEMS sends configuration messages to the SNMP agent in the ATMIF firmware to configure the alarmed device, and the SNMP agent rejects the command. When this alarm occurs, the affected device may not be able to pass traffic.

Severity

This is a critical fault.

Action

Step	Action
1	Call Nortel Networks Technical Support.

—end—

ATM, line card
Firmware mismatch

Probable cause

This fault occurs when the provisioned loadname is different from the load that is running in the card. The condition can be service affecting.

Severity

This is a minor fault.

Action

Step	Action
1	In uEMS, right click on the device and select **Provision/Edit** *The Object Description window appears.*
2	Double click on **UE9000 Map Application**. *A window showing the attributes of the device appears.*
3	Scroll down to find the current load and provisioned load. If the provisioned load is incorrect, go to step 4. If the current load is incorrect, go to step 6.
4	If the provisioned load is incorrect, right click the icon of the device and select **Change XXX Provisioned Load** where XXX = ATMIF or Line Card. *A window that allows you to change the provisioned load appears.*
5	Select the correct load from the list or type in the name of the load, then click **OK**. *The alarm should clear within a few seconds.*
6	If the current load is incorrect, lock the device by right clicking the icon of the device and select **Maintenance -> XXX -> Lock -> Normal**.
7	Reload the firmware on the device by right clicking the icon of the device and select **Maintenance -> XXX -> Reload -> Normal**.
8	Unlock the device by right clicking the icon of the device and select **Maintenance -> XXX -> Unlock -> Normal**. **—end—**

ATM, line card
Hardware mismatch

Probable cause

This fault occurs when the provisioned hardware type is different from the hardware that is physically inserted into the slot.

Severity

This is a critical fault.

Action

Step	Action
1	Either change the provisioning to match the hardware that is installed, or replace the hardware to match the type that is provisioned.

—end—

Line card
In service LC removed

Probable cause

This fault occurs when a line card that is in-service is physically removed from the slot.

Severity

This is a minor fault.

Action

Step	Action
1	Do one of the following: • reinsert the line card • unprovision the line card • lock the line card **—end—**

STU-C
STU-C failure

Probable cause

This fault occurs when the hardware associated with this circuit is bad.

Severity

This is a minor fault.

Action

Step	Action

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

CAUTION
Loss of service
You must wait more than five seconds to reinsert a line card after removing the line card from the shelf to reseat it. If you do not wait more than five seconds, the line card can drop all voice and data service for five to eight minutes.

1 Replace the line card. For information on replacing the line card, see Procedure 2-9 on page 2-20.

2 If the fault remains, replace the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

STU-C
Loss of frame

Probable cause

This fault occurs when the line card detects 8 frames of contiguous severely errored frame (SEF) defects and there is no loss of signal (LOS) defect or fault. The frame field can be configured during provisioning.

The line card clears this fault when you regain frame.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action

1 Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2 Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

STU-C
Loss of frame (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4 If the fault remains, replace the CPE or the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

STU-C
Loss of link

Probable cause

This fault occurs in the following instances:

- An STU-C loss of signal (LOS) fault occurred (see "Loss of signal" on page 4-43).
- An STU-C loss of frame (LOF) fault occurred (see "Loss of frame" on page 4-37).

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

STU-C
Loss of link (continued)

Step	Action
3	Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4 If the fault remains, replace the CPE or the line card.

Note: This fault is reported by individual circuits on a line card. Other circuits on the line card may remain operational. You can choose to replace the line card or move the subscriber to a functioning circuit.

—end—

STU-C
Loss of signal

Probable cause

This fault occurs when the line card loses sync with the remote CPE.

The line card clears this fault when no LOS defects occur on an active link.

The most common cause for this fault is that the customer premises equipment (CPE) has been turned off.

Severity

This is a minor fault.

Action

Step	Action
1	Does the subscriber experience intermittent service?

If	Then
yes	There may be loop impairment or faulty modems. Go to step 2.
no	Go to step 3.

2	Change the circuit provisioning parameters to improve immunity to severe loop impairment. See the *UE9000 Data OAM&P User Guide* for provisioning information. If the fault remains, go to step 3.

—continued—

STU-C
Loss of signal (continued)

Step	Action

3 Check the connection of the subscriber's loop to the line card.

CAUTION
Loss of service
Removing or reseating a line card that supports both voice and data services causes a loss of those services on all circuits on the line card.

4 If the fault remains, move the subscriber to another line circuit. Does the fault reoccur?

If	Then
yes	The problem is in the line circuit. Replace the line card.
no	The problem is in the subscriber loop or CPE. Replace the CPE.

—end—

STU-R
Loss of power

Probable cause

This fault occurs when the line card detects a far-end loss of power fault.

Severity

This is a minor fault.

Action

No action is required. The customer premises equipment may send this fault when power is removed. It is a normal power off condition.

Note: Some customer premises equipment may not send this signal on power off.

—end—

STU-R
Remote alarm indicator

Probable cause

This fault occurs when the CPE sends a remote alarm indication to the line card.

Note: Some customer premises equipment may not send this signal on power off.

Severity

This is a minor fault.

Action

Step	Action
1	Replace the CPE or check the line between the line card and the CPE.
2	If the fault remains, replace line card.

—end—

Hardware Failure

Downstream cell buffer overflow

Probable cause

This fault occurs when an xDSL circuit cannot handle the speed of traffic coming in from the ATM card.

Severity

This is a major fault.

Action

Step	Action
1	Compare the cell rates in the Service Descriptor field with the circuit provisioned data rate and adjust them accordingly. Adjust the Service Descriptor down and or the data rate up as needed.

—end—

Hardware Failure

Upstream cell buffer overflow

Probable cause

This fault occurs when there is severe congestion in the network or in the ATM core card. The fault may clear itself. If it persists, the fault may indicate a provisioning issue.

Severity

This is a major fault.

Action

Step	Action
1	Compare the cell rates in the Service Descriptor field with the circuit provisioned data rate and adjust them accordingly. Adjust the Service Descriptor down and or the data rate up as needed.

—end—

Hardware Failure
ATM device timeout

Probable cause

This happens when a hardware failure occurs.

Severity

This is a major fault.

Action

Replace the line card. Refer to Procedure 2-12, “Replacing an xDSL multi-circuit line card” on page 2-32.

—end—

Hardware Failure
ATM device parity error

Probable cause

This fault occurs when you get a parity error. This fault should clear on its own. If the fault stays raised, then a hardware problem exists.

Severity

This is a major fault.

Action

If the fault does not clear, replace the line card. Refer to Procedure 2-12, “Replacing an xDSL multi-circuit line card” on page 2-32.

—end—

List of terms

This chapter defines many of the acronyms and terms used in this user guide.

10Base-T

An Ethernet standard that allows Ethernet encoded data to be transported over unshielded twisted pair telephone wire. 10Base-T provides an operating rate of 10 megabits per second.

ADSL

asymmetric digital subscriber line. It is modem technology that enables the UE9000 CPE to send both data and voice over existing twisted pair copper wires to and from the end user. The data and voice signals are sent using different spectrums, which allow both signals to be sent over the same wire simultaneously. ADSL technology is asymmetric, which means the upstream and downstream data rates can be different.

ARP

address resolution protocol, part of ICMP (See *RFC792, Internet Control Message Protocol*), which itself is an integral part of IP. In IP, ARP is used to discover the hardware MAC address of a destination device when only its IP address is known. See *RFC826, An Ethernet Address Resolution Protocol*.

ATM

Asynchronous transfer mode. A protocol that packs digital information into 53-byte cells (5 byte header and 48 bytes of payload) that are switched throughout a network over virtual circuits. Standardized by the ITU-T in 1988 to create a Broadband Integrated Services Digital Network (B-ISDN). Its ability to accommodate multiple types of media (voice, video, data) make it a very useful for full service networks based on ADSL and VDSL.

ATU-C

ADSL transceiver unit, central office end. Traffic from the ATU-R to the ATU-C is considered to be upstream. Traffic from the ATU-C to the ATU-R is considered to be downstream.

ATU-R

ADSL transceiver unit, remote end. Traffic from the ATU-R to the ATU-C is considered to be upstream. Traffic from the ATU-C to the ATU-R is considered to be downstream.

bit

binary digit, which is the smallest unit of information that a computer can process. A bit is either a 0 or 1.

byte

a group of bits of a defined length which is used to represent a value, such as a letter, punctuation mark, symbol, and so on. A byte is usually 8 bits long.

CO

central office

CPE

Universal Edge 9000 customer premise equipment, which is the modem in the end-user's home or office. The UE9000 CPE routes voice traffic from a standard telephone and data traffic from one computer to the ANX and vice-versa.

DAC

data access card. The ATM card is currently the only type of DAC that uEMS supports.

DLC

digital loop carrier

DMS

digital multiplex switch

event

a system occurrence that requires user notification. uEMS events are generated using SNMP. The following are some conditions that generate uEMS events:

- a threshold limit was exceeded

- the configuration of a node changed
- the status of a node changed
- a warm or cold restart occurred on a node

gateway

a device that connects two separate networks together. A gateway allows devices on one network to access a second network.

GUI

graphical user interface

HEC

header error check

HPOV NNM

Hewlett Packard OpenView Network Node Manager. This is an Internet protocol (IP) network manager application. It is also used to provide a common manager platform for multiple applications such as uEMS.

HSTP

high speed twisted pair

IMA

Inverse Multiplexing for ATM. See ATM Forum document *af-phy-0086.001, Inverse Multiplexing for ATM (IMA) Specification Version 1*.

IP

Internet Protocol. See *RFC-791, Internet Protocol*.

LAN

local area network

MAC address

media access control address, a unique 48-bit number assigned to every physical Ethernet interface device (such as a network interface card). The first 24 bits are the OUI (organizationally unique identifier) assigned by the IEEE for manufacturer identification, and the remaining 24 bits are assigned by the manufacturer for the serial number. See *RFC1700, Assigned Numbers* or http://standards.ieee.org/regauth/oui/index.shtml, for more details on assigned OUIs.

MDF

main distribution frame

MIB

management information base. A MIB is a collection of standard information about a device. Each managed device on the UE9000 network has a MIB that is accessed using SNMP.

MLC

multi-circuit line card

NIC

network interface card

OAM&P

operations, administration, maintenance, & provisioning

object

is an entry in the HPOV NNM database which is used to represent the attributes of a specific entity in the UE9000 network. An object can be a physical entity, such as a hardware device, or a logical entity, such as a group of hardware devices.

octet

a frame of information that is one byte (8 bits long)

OPC

operations controller. A plug-in module for the common-equipment shelf or an operations controller shelf. The OPC provides OAM&P to the access bandwidth manager (ABM) shelves, host digital terminals (HDT), and other network elements in its span of control.

POTS

plain old telephone service

PPP

point-to-point protocol

protocol

a set of rules that enables two machines having similar functions to communicate with each other

PSTN

public switched telephone network

selection name

HP OpenView and uEMS software identify objects by their selection name and unique name. No two objects in the same network can have the same selection name. The selection name must be unique for each object in the uEMS database. The selection name can be sixteen characters long. Do not use spaces. It can consist of alphanumeric and symbol characters.

SNMP

a protocol used to manage TCP/IP-based networks. See *RFC1157, Simple Network Management Protocol*.

submap

a view of a specific section of the UE9000 network

subnet mask

allows the subdividing of a contiguous range of IP addresses into smaller, more manageable subnetworks. See *RFC0950, Internet Standard Subnetting Procedure* and *RFC1519, Classless Inter-Domain Routing (CIDR): an Address Assignment and Aggregation Strategy* for more information.

TCP

transmission control protocol, which is a protocol in the TCP/IP suite of protocols. It provides reliable end-to-end data transmission.

TFTP

trivial file transfer protocol

uEMS

Universal Edge 9000 Element Management System, which is a graphical user interface that provides OAM&P for UE9000 data service. uEMS runs on a Hewlett-Packard UNIX workstation or a Sun Microsystems Solaris workstation running HPOV NNM. uEMS communicates with the data processor using SNMP.

VF

voice frequency

VLAN

virtual local area network

xDSL

x digital subscriber line. A generic name for digital subscriber line equipment and services. Digital subscriber line technologies provide high-speed digital bit stream over the same wires used for analog connection. Some DSL technologies are asymmetric DSL, Nortel Networks proprietary 1-Meg Modem, and synchronous DSL. *See also* ADSL.

Procedures and descriptions in this document that refer to xDSL line cards apply to the ADSL 4+4 multi-circuit line cards.

Index

R

T

U

X

LED Quick Reference

Circuit pack LEDs indicate card status.

For normal operation, all LEDs are **off**, or only the green LED is **on**. Any of the LEDs can be **on** simultaneously. On power up, the LEDs are **on** briefly before normal operation resumes.

> ***Note:*** If there are two DS3 ATM core cards in the UE9000 shelf, the system LEDs on the standby DS3 core card are **off** when the card is ready and active-capable.

LEDs for core cards and multi-circuit line cards	
 Amber	**Meaning:** Maintenance activity in progress **Causes:** Loopback in place, download occurring, booting, line under test, etc. **Action:** This is a temporary condition. Do not replace the card
 Red	**Meaning:** Critical hardware failure **Causes:** Full or partial card failure, non-downloadable firmware incorrect, loss of signal on any interface, loss of framing, incorrect provisioning **Action:** Check provisioning. If not correct, replace the card
 Green	**Meaning:** Activity in active/standby units **Causes:** Customer voice or data traffic exists **Action:** Removing the card will interrupt service
LED (single, tri-color) on DS3 core card for DS3 network connection	
 Red	**Meaning:** Network loss of signal (LOS) or loss of frame (LOF) detected
 Amber	**Meaning:** Remote alarm indication (RAI) signal detected
 Green	**Meaning:** Normal activity
LEDs for the shelf interconnect (SI) card	
 Red	**Meaning:** Shelf fail (any card failed)
 Red	**Meaning:** Fail (SI)
 Green	**Meaning:** Active

DMS-100

Universal Edge 9000 DMS

Data Troubleshooting Guide

Product Documentation, Dept 3423
Nortel Networks
PO Box 13010
RTP, NC 27708-3010
Telephone: 1-877-662-5669

electronic mail: cits@nortelnetworks.com

Publication number: 297-8391-501
Product release: NA015

Document release: Standard 01.01
Date: March 2001
Printed in the United States of America