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Configuring ATM Services

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Preface

This guide describes asynchronous transfer mode (ATM) and what you do to start and customize ATM services on a Nortel Networks™ router.

You can use the Bay Command Console (BCC™) or Site Manager to configure ATM on a router. In this guide, you will find instructions for using both the BCC and Site Manager.

Before You Begin

Before using this guide, you must complete the following procedures. For a new router:

- Install the router (see the installation guide that came with your router).
- Connect the router to the network and create a pilot configuration file (see *Quick-Starting Routers*, *Configuring BayStack Remote Access*, or *Connecting ASN Routers to a Network)*.

Make sure that you are running the latest version of Nortel Networks BayRS™ and Site Manager software. For information about upgrading BayRS and Site Manager, see the upgrading guide for your version of BayRS.

Text Conventions

This guide uses the following text conventions:

angle brackets (< >)

Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command.

Example: If the command syntax is:
ping <*ip_address*>, you enter:
ping 192.32.10.12

bold text

Indicates command names and options and text that you need to enter.

Example: Enter **show ip** {**alerts** | **routes**}.

Example: Use the **dinfo** command.

braces ({})

Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command.

Example: If the command syntax is:
show ip {**alerts** | **routes**}, you must enter either:
show ip alerts or **show ip routes**, but not both.

brackets ([ ])

Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command.

Example: If the command syntax is:
show ip interfaces [**-alerts**], you can enter either:
show ip interfaces or **show ip interfaces -alerts**.

ellipsis points (. . .)

Indicate that you repeat the last element of the command as needed.

Example: If the command syntax is:
ethernet/2/1 [<*parameter*> <*value*>] **. . .** , you enter
ethernet/2/1 and as many parameter-value pairs as needed.

italic text	Indicates file and directory names, new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is: **show at** <*valid_route*> *valid_route* is one variable and you substitute one value for it.
`screen text`	Indicates system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`
separator (>)	Shows menu paths. Example: Protocols > IP identifies the IP option on the Protocols menu.
vertical line (|)	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is: **show ip** {**alerts** | **routes**}, you enter either: **show ip alerts** or **show ip routes**, but not both.

Acronyms

This guide uses the following acronyms:

AAL	ATM adaptation layer
ABR	available bit rate
AFI	authority and format identifier
AIS	alarm indication signal
ALC	adaptation layer controller
ARE	ATM Routing Engine

ARP	Address Resolution Protocol
ATM	asynchronous transfer mode
BFE	Blacker front-end encryption
B-ISDN	Broadband Integrated Services Digital Network
BUS	broadcast and unknown server
CLP	cell loss priority
CPCS	common part convergence sublayer
CS	convergence sublayer
CSU	channel service unit
DCE	data communication equipment
DDN	Defense Data Network
DSU	data service unit
DTE	data terminal equipment
ELAN	emulated local area network
ER	error recovery
FIB	forwarding information base
HEC	header error control
IETF	Internet Engineering Task Force
ILI	Intelligent Link Interface
ILMI	Interim Local Management Interface
IP	Internet Protocol
IPX	Internetwork Packet Exchange
ITU-T	International Telecommunication Union - Telecommunication Standardization Sector
LANE	local area network emulation
LDP	label distribution protocol
LE	LAN emulation
LEC	LAN emulation client
LECS	LAN emulation configuration server

LER	label edge router
LES	LAN emulation server
LIS	logical IP subnet
LLC	Logical Link Control
LUNI	LAN emulation UNI
MAC	media access control
MBS	maximum burst size
MCR	minimum cell rate
MCS	multicast server
MIB	management information base
MPC	Multi-Protocol over ATM client
MPLS	Multiprotocol Label Switching
MPOA	Multi-Protocol over ATM
MPS	MPOA server
MTU	maximum transmission unit
NHRP	Next Hop Resolution Protocol
NML	Native Mode LAN
NMS	network management station
NNI	network-to-network interface
OAM	Operations and Management
OAM&P	Operations, Administration, Maintenance and Provisioning
OC-3	Optical Carrier-level 3
OSI	Open Systems Interconnection
OSPF	Open Shortest Path First
PCR	peak cell rate
PD	poll data
PDN	Public Data Network
PDU	protocol data unit
PHY	physical [layer]

PMD	physical medium dependent
PT	payload type
PVC	permanent virtual circuit
RDI	remote defect indication
RIP	Routing Information Protocol
RS	resynchronization
SAAL	signaling AAL
SAP	service access point
SAR	segmentation and reassembly
SCR	sustainable cell rate
SD	sequenced data
SDU	service data unit
SMDS	Switched Multimegabit Data Service
SNAP	Subnetwork Access Protocol
SNMP	Simple Network Management Protocol
SONET/SDH	Synchronous Optical Network/Synchronous Digital Hierarchy
SPE	synchronous payload envelope
SRM	System Resource Module
SSCOP	Service Specific Connection Oriented Protocol
SSCS	service specific convergence sublayer
STP	shielded twisted pair
SVC	switched virtual circuit
TOH	transport overhead
UNI	user-to-network interface
UTP	unshielded twisted pair
VBR	variable bit rate
VC	virtual circuit
VCC	virtual channel connection
VCI	virtual channel identifier

VCL	virtual channel link
VPC	virtual path connection
VPI	virtual path identifier
WAN	wide area network

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Technical Solutions Center	Telephone Number
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Valbonne, France	33-4-92-96-69-68
Sydney, Australia	61-2-9927-8800
Tokyo, Japan	81-3-5402-7041

Chapter 1
Understanding ATM, ATM Router Redundancy, and OAM

This chapter describes the concepts underlying ATM and, where appropriate, the specific ways Nortel Networks implements these concepts on its routers. It contains the following information:

ATM General Information

Asynchronous transfer mode (ATM) is a connection-oriented, cell-based technology that relays traffic across a Broadband Integrated Services Digital Network (B-ISDN). ATM provides a cost-effective way of transmitting voice, video, and data across a network.

ATM Cells

An ATM cell is a fixed-length packet of 53 bytes. It consists of a 5-byte header containing address information and a fixed, 48-byte information field. Figure 1-1 shows a diagram of an ATM cell.

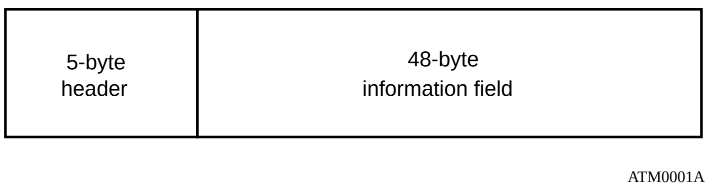


Figure 1-1. ATM Cell

This fixed-length cell size allows you to predict network delays, making ATM suitable for carrying real-time information (for example, voice and video) as well as data.

ATM allows the network to operate at a much higher rate than typical packet-switching protocols (for example, X.25), because it provides no error protection or flow control. Instead, ATM relies on the source and destination devices to perform error-recovery functions such as retransmission of lost packets.

Cell Header

After dividing the data into 48-byte segments for transmission, the end device -- that is, the ATM data service unit/channel service unit (DSU/CSU) or native ATM device -- attaches the required header information (Figure 1-2).

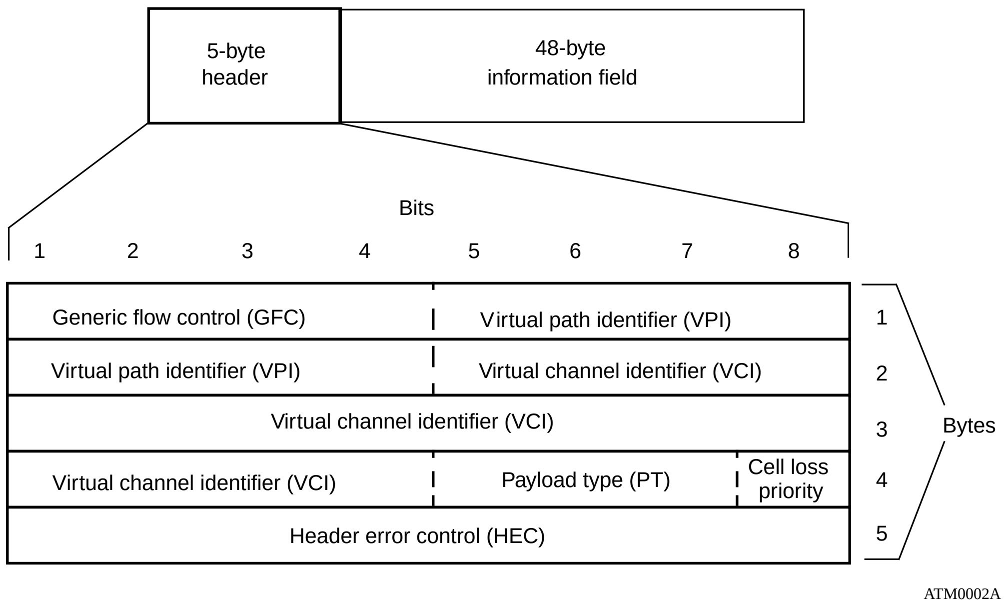


Figure 1-2. ATM Cell Header

The fields in each ATM cell header provide all the information necessary for networking. These fields include the following:

- Generic flow control (GFC): The first 4 bits of the cell header contain the GFC. The GFC controls traffic flow onto the ATM network by controlling the user-to-network interface (UNI).
- Virtual path identifier (VPI): The next 8 bits of the cell header (that is, the last half of byte 1 and the first half of byte 2) contain the VPI. The VPI specifies a virtual path on the physical ATM link. See the next section, “Data Transmission,” for additional information about virtual paths.

- Virtual channel identifier (VCI): The next 16 bits of the cell header (that is, the last half of byte 2, byte 3, and the first half of byte 4) contain the VCI. The VCI specifies a virtual channel within the virtual path on the physical ATM link. See the next section, "Data Transmission," for additional information about virtual channels.
- Payload type (PT): The next 3 bits (that is, bits 5 through 7 of byte 4) indicate the type of information the cell is carrying (for example, user data or management information).
- Cell loss priority (CLP): The last bit of byte 4 indicates the priority of the cell and whether the network can discard the cell under heavy traffic conditions. Setting the bit to 1 indicates the network may discard the cell if necessary.
- Header error control (HEC): The last byte of the header field contains the HEC. Its primary function is to guard against misdelivery of cells due to header or single-bit errors. However, the HEC does not gauge the quality of the data in the information field.

Cell Information Field

Following the 5-byte cell header is a 48-byte information field containing user data. The ATM adaptation layer (AAL) organizes the data in this field. See "ATM Layers" on page 1-6 for additional information about the AAL.

Data Transmission

Data transmission (also called *cell switching*) through the ATM network relies on the establishment of logical connections between ATM devices. ATM is a *connection-oriented* service. This means that an ATM device cannot transmit information until it establishes a connection with a receiving device. These connections consist of virtual channels, virtual paths, and transmission paths.

A *virtual channel* is a logical connection between two communicating ATM devices. Each virtual channel can carry a different protocol or traffic type. The virtual channel transports cells that have a common identifier, the VCI, that is part of the cell header. You can establish virtual channels permanently or set them up dynamically, allowing the network to adjust itself to the traffic demand.

A *virtual path* is a set of virtual channels between a common source and destination. The virtual channels in a virtual path are logically associated with a common identifier, the virtual path identifier (VPI), that is part of the cell header. You can base cell switching on either the VPI alone, or on a combination of the VPI and VCI.

Virtual paths enable you to separate network transport functions into those related to an individual logical connection (virtual channel) and those related to a group of logical connections (virtual path).

A *transmission path* is a physical connection that comprises several virtual paths, each virtual path containing several virtual channels. The transmission path can support multiple virtual paths across a single connection to the network.

Figure 1-3 shows the relationships between the virtual channel, the virtual path, and the transmission path.

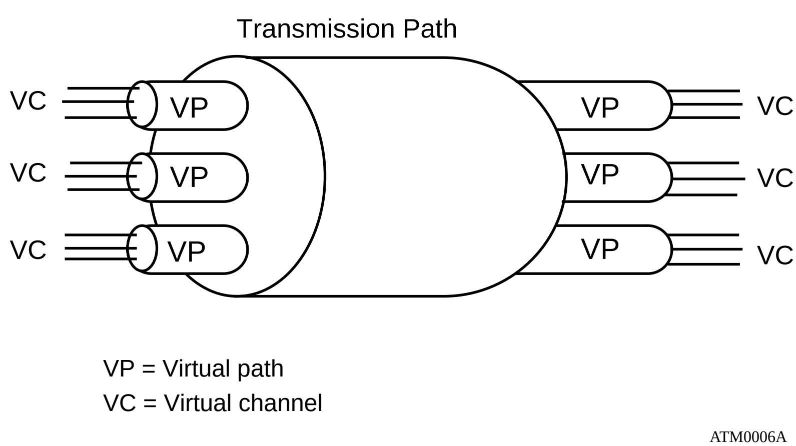


Figure 1-3. ATM Transmission Components

Protocol Prioritization

You can set the priorities for the traffic sent across a synchronous line interface using a process called protocol prioritization. The ability to prioritize traffic is important for an application that is time-sensitive and that requires a fast response.

For example, a user at router A participating in a Telnet session with router B requires a more immediate response than does a user at router A performing a file transfer with router B.

You must manually start protocol prioritization on an ATM circuit. You can use protocol prioritization for IP traffic travelling over an ATM PVC.

For more information about protocol prioritization, see *Configuring Traffic Filters and Protocol Prioritization*.

Permanent and Switched Virtual Connections

Virtual channels and virtual paths allow you to establish virtual channel links (VCLs). You can create VCLs as either permanent virtual circuits (PVCs) or switched virtual circuits (SVCs). After you establish a PVC, you can transfer information over it at any time. SVCs activate, through signaling and network switching, only when there is information ready for transmission.

ATM Layers

The B-ISDN protocol reference model, on which ATM is based, consists of four layers (Figure 1-4). Each layer communicates only with the layer directly above it and the layer directly below it.

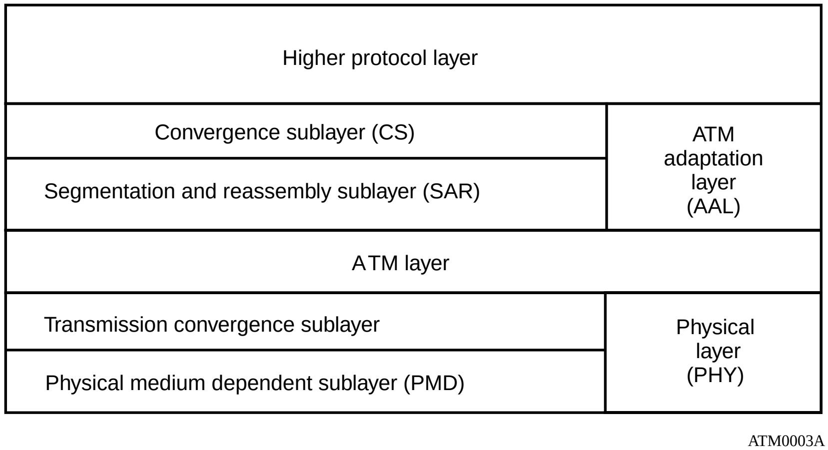


Figure 1-4. B-ISDN ATM Protocol Reference Model

The following layers relate directly to how Nortel Networks routers support ATM:

- Physical layer
- ATM layer
- ATM adaptation layer (AAL)

Physical Layer

In a Nortel Networks Backbone Node (BN®) router, Intelligent Link Interface (ILI) pairs provide access and processing. An ILI pair consists of a link module and a processor module that work together to process and transmit information over a network. Nortel Networks provides an ATM Routing Engine (ARE) link module in conjunction with an ARE processor.

In addition, Nortel Networks provides a hub version of the ATM ARE ILI pair, the Model 5782 ATM router. This single hub module, incorporating the ILI functions of both the link module and processor module, resides in a System 5000BH chassis. See *Using the Model 5782 ATM Virtual Network Router* for more information.

The ILI pair and the Model 5782 ATM router are functionally identical, and you configure them in much the same way. Unless otherwise noted, the remainder of this guide treats the router ILI pair and the Model 5782 as if they were the same.

Depending on the ATM router type, you can connect directly to an ATM network over any of the following physical interfaces:

- Optical carrier level 3 (OC-3)
- Digital service level 3 (DS-3)
- E-3 (the European equivalent of the North American DS-3)

Although Nortel Networks uses raw bandwidth to describe line rates, inherent overhead within the media limits maximum bandwidth for the line. Use Table 1-1 to determine the maximum bandwidth for the media you are using.

Table 1-1. Maximum Bandwidth by Media Type

Media	Raw Bandwidth (Mb/s)	Maximum Bandwidth (Mb/s)	Maximum Cells/s
OC-3 SONET/SDH	155	149.76	353207
DS-3 (Cbit and M23 framing)	44.736	40.704	96000
E-3 (G.832 framing)	34.368	33.920	80000
E-3 (G.751 framing)	34.368	30.528	72000

ATM Layer

The *ATM layer* defines how two nodes transmit information between them. It is concerned with the format and size of the cells and the contents of the headers. The addresses of the cells are meaningful only to the two adjacent local nodes (that is, usually not to the end nodes).

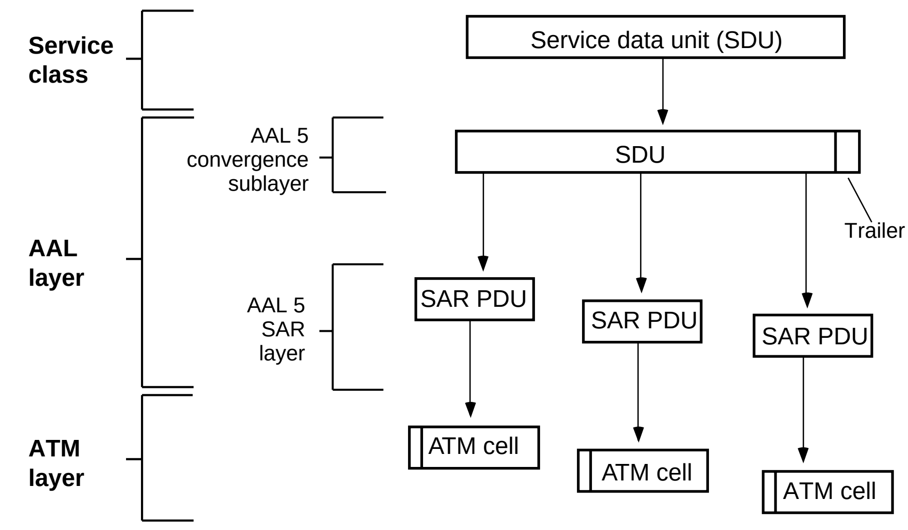
ATM Adaptation Layer

The *ATM adaptation layer (AAL)* converts upper-layer protocol data into formats that are compatible with the requirements of the ATM layer, enabling ATM to handle different types of information within the same format.

The AAL is divided into two sublayers: the *convergence sublayer (CS)* and the *segmentation and reassembly (SAR) sublayer.* These two sublayers convert variable-length messages into 48-byte segments, while ensuring the integrity of the data.

The CCITT (now ITU-T) has defined different types of AALs to handle different kinds of traffic. Nortel Networks ATM routers support a CS function compatible with AAL 5, as defined in Section 1 of the CCITT (now ITU-T) *B-ISDN Protocol Reference Model* (PRM).

In AAL 5, only a trailer attaches to the data from the upper-layer protocols to create a CS PDU. AAL 5 divides the protocol data unit (PDU) into a 48-octet SAR PDU; however, it does not add an SAR header and trailer. This 48-octet SAR PDU becomes the payload of the ATM cell (Figure 1-5).



Note: AAL 5 does not attach an SAR header or trailer to the PDU.

ATM0005A

Figure 1-5. ATM Adaptation Layer 5

Service Records and Virtual Circuits

ATM devices communicate using virtual circuits (VCs). These VCs transmit and receive ATM cells containing upper-layer protocols. Nortel Networks ATM routers use service records to provide a way of creating logical interfaces (within the physical ATM interface) for these upper-layer protocols. In essence, these service records allow you to:

- Organize multiple VCs into logical groups.
- Create direct point-to-point connections.
- Assign, delete, and modify upper-layer protocols for just one PVC or for a group of VCs at any given time.

Supported Protocols

Depending on the data encapsulation type and virtual connection type (PVC, SVC or WAN SVC) you choose for the service record, the router supports various protocols.

Table 1-2 lists all supported protocols for standard PVCs and SVCs using LLC/SNAP, NLPID, NULL, LANE 802.3, or LANE 802.5 data encapsulation.

Table 1-2. Protocols Supported for Standard PVCs and SVCs

PVC Using LLC/SNAP, NLPID, or NULL	SVC Using LLC/SNAP or NULL (RFC 1577)	SVC Using LANE 802.3	SVC Using LANE 802.5	WAN SVC Using LLC/SNAP
Bridge	IP	Bridge	Bridge	IP
Spanning Tree	RIP	Spanning Tree	Spanning Tree	RIP
Native Mode LAN	BGP	Native Mode LAN	IP	IPX
IP	OSPF/MOSPF	IP	RIP	RIP/SAP
RIP	IPv6	RIP	OSPF/MOSPF	
EGP	AHB	BGP	BootP	
PIM	NHRP	OSPF/MOSPF	NHRP	
NHRP	RSVP	BootP	RSVP	
RSVP	NAT	Router Discovery	NAT	
NAT	L2TP	IGMP/IGMP Relay	L2TP	

(continued)

Table 1-2. Protocols Supported for Standard PVCs and SVCs *(continued)*

PVC Using LLC/ SNAP, NLPID, or NULL	SVC Using LLC/SNAP or NULL (RFC 1577)	SVC Using LANE 802.3	SVC Using LANE 802.5	WAN SVC Using LLC/SNAP
L2TP	DiffServ	DVMRP	DiffServ	
DiffServ	IPv6	NetBIOS	IPX	
BGP		PIM	RIP/SAP	
OSPF/MOSPF		NHRP	Source Routing	
BootP		RSVP	SR Spanning Tree	
IGMP/IGMP Relay		NAT	Translate/LB	
DVMRP		L2TP	LLC2	
NetBIOS		DiffServ	DLSw	
DECnet IV		DECnet IV	APPN	
VINES		VINES		
IPX		IPX		
RIP/SAP		RIP/SAP		
OSI		XNS		
TARP		RIP (XNS)		
Source Routing		AppleTalk		
SR Spanning Tree		LLC2		
Translate/LB		DLSw		
XNS				
RIP (XNS)				

Caution: Ethernet and token ring emulated LANs can support different protocols. When adding a protocol to a LANE service record with an unspecified emulated LAN type, ensure that the protocols you add are supported by the emulated LAN (Ethernet or token ring) that you want to join.

Things to Remember

When enabling protocols on a service record, keep the following in mind:

- A PVC service record requires that you add at least one PVC for the service record to operate.
- Each ATM service record globally controls:
  - All protocols for any standard PVCs and SVCs that it contains
  - All nonbridging protocols for any hybrid PVCs that it contains
- Selecting LANE to run on an SVC service record defines that service record as belonging to an emulated LAN. Any protocols on that service record operate as if they were running over a traditional Ethernet or token ring LAN.
- When running IP over a NULL encapsulated PVC service record, you must change the Address Resolution parameter to None. You must then add an IP adjacent host with the MAC address equal to the VPI/VCI of the PVC. See *Configuring IP, ARP, RARP, RIP, and OSPF Services* for information about the Address Resolution parameter.

Rules for Editing Protocols

Depending on the type of virtual circuit you are using, Site Manager requires you to add additional protocols, or delete and edit existing protocols, from specific protocol menus.

Use Table 1-3 to locate the appropriate protocol menu for each access mode.

Table 1-3. Locating and Using Site Manager Protocol Menus

Site Manager Menu Location	PVCs and SVCs	Hybrid PVCs Only
ATM Service Records List window	✓	✓†
ATM Virtual Channel Link window		✓*

* For nonbridging protocols
† For bridging protocols

Remember, hybrid PVCs use their service record configurations for nonbridging protocols and their individual configurations for bridging protocols.

Data Encapsulation Methods

Nortel Networks ATM routers support multiprotocol encapsulation (as defined in RFC 1483), enabling the router to multiplex (combine) and demultiplex (separate) bridged or routed protocol data units (PDUs).

For transmission, the encapsulation process adds a header from 2 to 8 octets in length to the PDU to allow decoding. The decoding process determines the proper service access point (SAP).

When receiving information, the encapsulation method evaluates the header to determine whether the PDU is a valid routed or bridged cell. If it is valid, the encapsulation method then strips the header from the cell and passes the cell to the appropriate SAP for routing or bridging.

You can choose from four data encapsulation types:

- LANE
- LLC/SNAP
- NULL
- NLPID

How you assign a data encapsulation type and which type takes precedence depends on the virtual circuit type and, for PVCs, the order in which you assign the encapsulation type.

Each ATM device must encapsulate PDUs before sending them to the SAR sublayer.

LANE Encapsulation

LANE provides Ethernet (IEEE 802.3) or token ring (IEEE 802.5) encapsulation of ATM PDUs for transmission over an emulated LAN. You can assign LANE encapsulation to SVCs only.

LLC/SNAP Encapsulation

Logical Link Control/Subnetwork Access Protocol (LLC/SNAP; RFC 1483) allows multiplexing of multiple protocols over a single ATM virtual circuit. In this approach, an IEEE 802.2 Logical Link Control (LLC) header prefixes each PDU. You can assign LLC/SNAP encapsulation to:

- PVC service records
- SVC service records
- WAN SVC service records
- Individual PVCs

Note: Assigning LLC/SNAP to an SVC service record automatically uses the technology defined in RFC 1577, *Classical IP and ARP over ATM*. For information about RFC 1577, see "Classical IP over ATM Concepts" on page 1-28.

NULL Encapsulation

RFC 1483 refers to NULL encapsulation as "VC-based multiplexing." This method performs upper-layer protocol multiplexing implicitly using ATM virtual circuits. You can assign NULL encapsulation to:

- PVC service records
- SVC service records
- Individual PVCs that are also members of an LLC/SNAP service record

Note: Assigning NULL to an SVC service record automatically uses the technology defined in RFC 1577, *Classical IP and ARP over ATM*. For information about RFC 1577, see "Classical IP over ATM Concepts" on page 1-28.

NLPID Encapsulation

You can use Network Layer Protocol ID (NLPID; RFC 1490) in an ATM environment for frame relay/ATM internetworking. You can assign NLPID encapsulation to PVC service records.

Selecting a Data Encapsulation Method

Generally speaking, the designers of these data encapsulation methods envisioned that NULL encapsulation would dominate in environments where the dynamic creation of large numbers of ATM VCs is fast and economical. These conditions usually exist in private ATM networks.

LLC/SNAP encapsulation is an alternative for environments in which it is not practical to have a separate VC for each carried protocol (for example, if the ATM network supports only PVCs, or if billing depends heavily on the number of simultaneous virtual circuits).

The choice of multiplexing methods that two ATM stations use to exchange connectionless network traffic depends on the type of virtual circuit involved:

- For PVCs, you select the multiplexing method when you manually configure the connection.
- For SVCs, the stations themselves negotiate the multiplexing method by sending B-ISDN signaling messages. These messages include “low-layer compatibility” information that allows negotiation of AAL5 and the carried (encapsulated) protocol.

➡ **Note:** Routed and bridged PDUs are always encapsulated within the payload field of the AAL5 CPCS PDU, regardless of the selected multiplexing method.

Selecting LLC/SNAP Encapsulation

When the same virtual circuit carries several protocols, select LLC/SNAP encapsulation. LLC/SNAP encapsulation attaches an LLC/SNAP header before the PDU. This header includes information that the receiving ATM station needs to properly process the incoming PDU. For bridged PDUs, this header also includes the type of the bridged media.

Selecting NULL Encapsulation (VC-Based Multiplexing)

In NULL encapsulation, the carried network protocol is identified implicitly by the virtual circuit connecting the two ATM stations. Because each protocol must travel over a separate virtual circuit, there is no need to include explicit multiplexing information in the payload of the PDU. For this reason, the bandwidth requirements and processing overhead remain minimal.

You can either manually configure the carried protocol or let the signaling procedures negotiate it dynamically during call establishment.

NULL encapsulated cells do not receive a header in a routed environment. In a bridged environment, the content of the PDU itself includes the necessary information for bridging the multiplexed protocols.

Encapsulation Rules for PVCs

How you assign data encapsulation to individual PVCs depends to a degree on the data encapsulation type you assigned to the service record that contains those PVCs. Table 1-4 provides suggestions for assigning data encapsulation to PVCs and hybrid PVCs that reside on these service records.

Table 1-4. Assigning Data Encapsulation to Individual PVCs

Service Record Data Encapsulation Type	Individual PVC Data Encapsulation Type	Hybrid PVC Data Encapsulation Type
LLC/SNAP	NULL or LLC/SNAP	LLC/SNAP
NULL	NULL or LLC/SNAP	LLC/SNAP
NLPID	NLPID	NLPID

When assigning a data encapsulation type to a PVC or group of PVCs, keep the following in mind:

- When you add a PVC, it reads and uses the data encapsulation type specified in its ATM service record.
- You can globally assign a data encapsulation type to all nonhybrid PVCs in a particular service record, or you can assign a data encapsulation type to individual group PVCs.
- If you change the data encapsulation value for the service record, all new PVCs that you add to that service record use the new value.
- You must assign a data encapsulation type to hybrid-mode PVCs individually. You cannot assign data encapsulation to a hybrid-mode PVC using the service record.
- When you use the copy function, the new PVC uses the data encapsulation type of the existing PVC.

- When running IP over a NULL encapsulated PVC service record, you must change the Address Resolution parameter to None. You must then add an IP adjacent host with the MAC address equal to the VPI/VCI of the PVC. See *Configuring IP, ARP, RARP, RIP, and OSPF Services* for information about the Address Resolution parameter.

PVC Access Methods

You can set up PVCs to access an ATM network in the following ways:

- Multiple PVCs per service record
- One PVC per service record
- Hybrid access PVCs

Multiple PVCs

Upper-layer protocols treat each service record on an ATM network interface as a single access point. These protocols use a single network address to send all traffic destined for the network to the ATM network interface. Figure 1-6 shows a conceptual drawing of multiple PVCs accessing an ATM network through each service record.

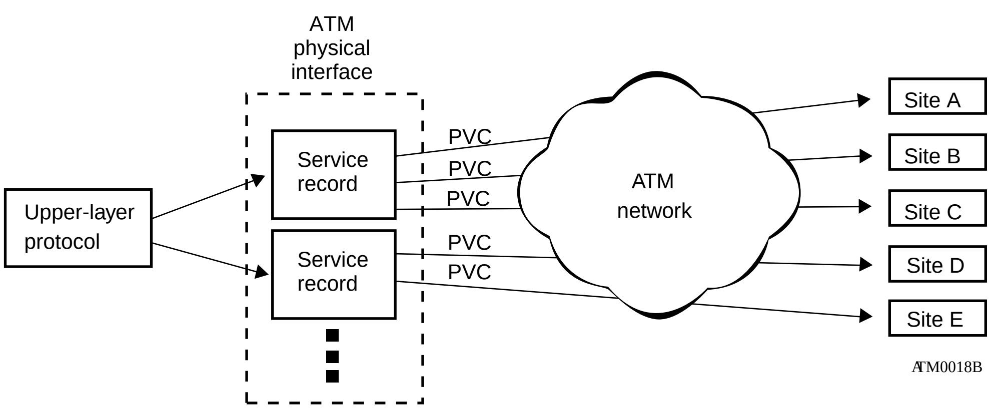


Figure 1-6. Multiple PVCs per Service Record

Configuring multiple PVCs per service record uses network addressing most efficiently. Although you need to configure each PVC manually, you need only define and associate protocols with the ATM network service record. All the PVCs that you configure for a given ATM service record carry the protocols that you select and configure to run on that service record.

Note: When you configure multiple PVCs per service record, all PVCs use the data encapsulation type that you set for the ATM service record. See "Data Encapsulation Methods" on page 1-13 for more information.

A configuration using multiple PVCs per service record works best in either fully meshed environments or in nonmeshed environments where systems not directly connected to each other have no need to communicate. You can configure multiple PVCs per service record as long as you do not need to separate protocols by PVC (that is, all PVCs accept the same protocols).

There are, however, ways to configure upper-layer protocols, such as IP or Internetwork Packet Exchange (IPX), to allow systems in nonmeshed networks to fully communicate. See the documentation for these protocols for more information.

One PVC

A configuration using one PVC per service record works the same way as one using multiple PVCs per service record. When you define only one PVC per service record, upper-layer protocols treat the ATM network as a series of direct point-to-point connections, viewing each PVC as an individual network interface.

You can configure each PVC with different protocols and parameter settings. This allows you to connect to different network sites using, for example, different types of data encapsulation (Figure 1-7).

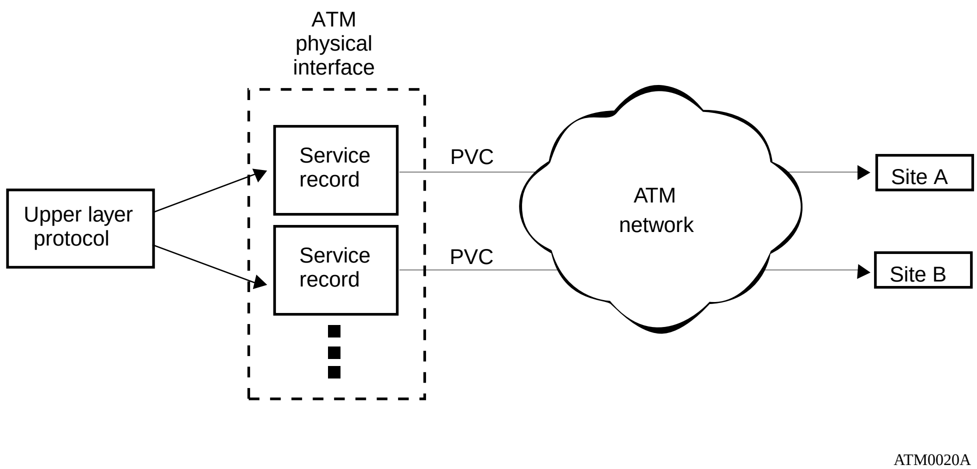


Figure 1-7. One PVC per Service Record

Assigning one PVC per service record allows you to dedicate a PVC to a particular protocol, but at the expense of some configuration overhead, memory, and address space.

This type of configuration is best suited to small, nonmeshed configurations or to configurations in which protocols must reside on separate PVCs.

Note: The maximum number of PVCs you can configure in this way varies, depending on the configuration of the router, the number of protocols running on the circuits, and the number of routing entries.

Hybrid Access PVCs

PVCs do not typically allow bridging in nonmeshed environments. If your network combines bridging and routing over the same interface, you need to use the service record portion of each PVC for routing, while at the same time allowing bridging to operate. To do this, you must define the PVC as a hybrid/bridged VC.

Defining the PVC as a hybrid/bridged VC allows the bridge to view each PVC as a separate bridge interface while allowing the routing protocols to view all PVCs as part of the same interface (Figure 1-8).

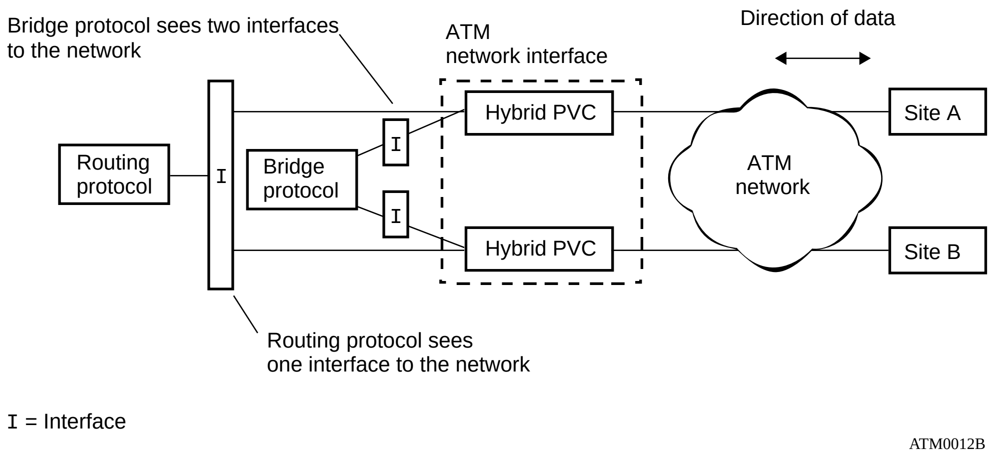


Figure 1-8. Hybrid Access PVCs

Use hybrid PVCs when creating nonmeshed network configurations that use both bridging and routing over a single ATM interface. These PVCs work best for spanning tree bridging.

➡ **Note:** When you define a PVC as a hybrid/bridged VC, Site Manager provides additional Bridge, Spanning Tree, Source Routing (SR), SR Spanning Tree, Translational/Learning bridge (Translate/LB), and Native Mode LAN (NML) protocol options. These protocols run on the PVC along with the protocols defined in the ATM service record.

Using Hybrid PVCs for Transparent Bridging

In Figure 1-9, traffic is bridged between site A and site B. The bridge (router 1) is running on the ATM network interface, and its PVCs are *not* defined as hybrid/bridged VCs.

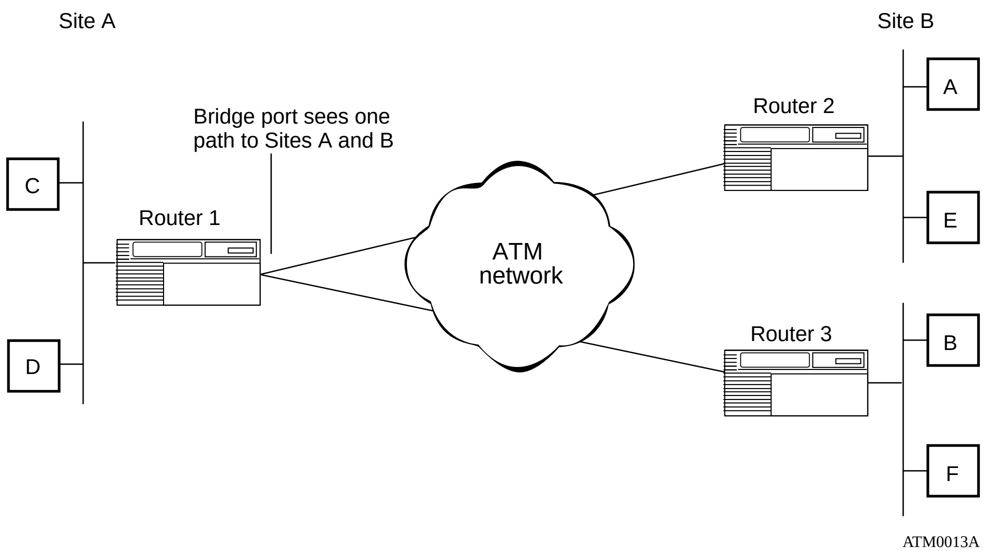


Figure 1-9. Example of a Bridged Network

In this example, when the bridge receives data from site A and does not recognize the destination address, it tries to direct traffic through another bridge port. However, because the PVCs are not defined as hybrid/bridged VCs, the ATM bridge port views the paths to site A and site B as the same.

A bridge does not send the same data over the bridge port from which it just received the data, so the bridge cannot direct the data to site B. To resolve this problem, you need to designate the PVCs on router 1 as hybrid/bridged VCs.

If you define the PVCs as hybrid VCs, each PVC acts as a separate bridge port. This enables the bridge running on the ATM interface to view the traffic from site A as arriving on a different port from that of site B. When the bridge sends data, it now has access to all its ports, including the port that accesses site B. Therefore, data from site A can reach site B.

SVC Access Methods

SVCs use signaling messages to dynamically establish, maintain, and clear a switched virtual connection at the UNI. These messages (as defined by the Q.2931 standard for signaling protocols) allow the router to assess the availability of an ATM end point (device), establish a connection with that device, maintain that connection for the duration of data transfer, and then clear the connection when the transfer is complete.

Assigning ATM Addresses

An ATM address is composed of a network prefix and a user part. Nortel Networks routers use the autogeneration feature to create the user part of the ATM address by combining the MAC address of the ATM interface with a unique selector byte to create unique addresses (Figure 1-10). You can also enter ATM addresses manually.

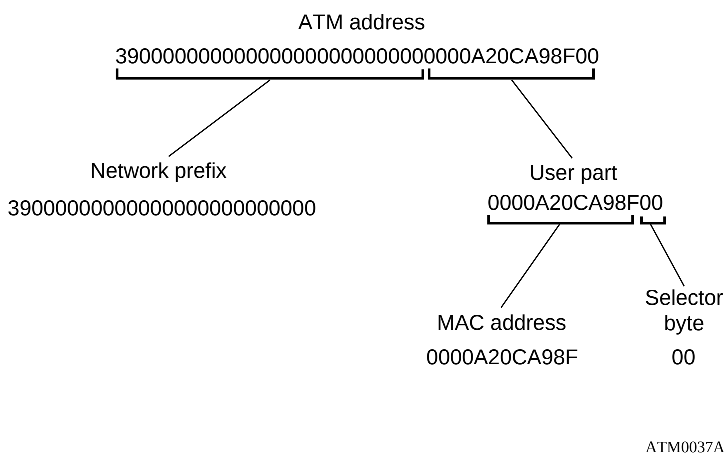


Figure 1-10. ATM Address Components

Entering an ATM Address Network Prefix

The ATM address network prefix specifies the ATM domain of which the service record is a part. This 13-byte portion of the ATM address can range from *XX*000000000000000000000000 to *XX*FFFFFFFFFFFFFFFFFFFFFFFF.

The *XX* byte must contain a value of 39, 45, or 47. These values define the authority and format identifier (AFI). The AFI byte identifies the group responsible for allocating the prefix and the format the prefix uses. For more information about the AFI byte, refer to the ATM Forum UNI specification.

Entering an ATM address network prefix is optional. If you do not enter a network prefix in the specified range, the service record accepts the first prefix value that it receives from the switch.

Entering an ATM Address User Part

The ATM address user part (suffix) consists of a 6-byte end-station identifier and a 1-byte selector field. This 7-byte portion of the ATM address can range from 00000000000000 to FFFFFFFFFFFFFF.

You can either allow the router to generate this value automatically, or you can enter the value manually.

ATM Traffic Parameters

The *ATM User-Network Interface Specification* defines the following traffic parameters:

- Peak cell rate (PCR) -- The upper traffic rate limit for an individual VC
- Sustainable cell rate (SCR) -- The upper bound on the conforming average rate of an individual PVC or control VC
- Maximum burst size (MBS) -- The maximum length of a cell stream allowed on a particular VC

These parameters help to prioritize and control the traffic on each VC. How you configure your ATM traffic parameters depends on the characteristics of the individual connections that you want to set up (for example, the desired maximum cell rate, average cell rate, and burst size).

You can change ATM traffic parameters several times before deciding on a particular set. The following sections describe the traffic parameters and provide some basic guidelines for customizing them on an ATM PVC or ATM control VC (that is, the signaling VC or ILMI VC).

Note: You do not need to manually configure traffic parameters for SVCs (as you must for PVCs and control VCs), because SVCs dynamically negotiate these parameters before sending data.

Using the PCR

The PCR specifies the upper traffic limit, in cells/second, that the ATM connection can support.

How you set the PCR depends on:

- The optical transmission rate of your ATM device
- The amount of traffic you expect on a particular VC
- The rate you want for each VC

When setting the PCR, keep the following considerations in mind:

- Each VC can have its own PCR.
- The PCR cannot exceed the maximum rate for the physical media. For example, you cannot exceed 149.76 Mb/s for an OC-3c line.
- The PCR specifies the desired rate for the attached physical media (that is, OC-3c, DS-3, or E-3). It does not specify the rate for the ATM network as a whole. For example, you can specify a full 149.76 Mb/s for each PVC or control VC on an OC-3c connection. However, if the VC ultimately connects to a lower-speed link (for example, T1 or E1), your PCR is limited to the maximum rate for that media.
- ATM VCs may fail to operate with PCR values lower than 128 cells/s.
- The E-3 framing mode setting affects the maximum PCR setting.

Using the SCR

The SCR is the upper bound on the conforming average rate of an individual PVC, control VC, or WAN SVC. The *average rate* is the number of cells transmitted over the link divided by the duration of the connection. The *duration of the connection* is the total amount of time it takes from connection setup to connection release.

The SCR allows you to define future cell flow on a PVC, control VC, or WAN SVC in greater detail than by using only the PCR. The SCR controls the rate over time -- not at a specific instant of time -- and can help you use your network resources more efficiently. In other words, the SCR allows sufficient bandwidth for operation, but does not allow a bandwidth as high as the PCR.

The SCR value maps directly to an MCR (minimum cell rate) value. In other words, when you configure the SCR on a device, you actually configure the upper bound of an average rate. Like the SCR, the MCR defines the minimum amount of guaranteed bandwidth allowed for PVCs, control VCs, or WAN SVCs on the ATM line. The MCR (that is, SCR) not only controls the rate over time, it guarantees this rate.

When setting the SCR, keep the following considerations in mind:

- The SCR maps directly to the MCR.
- The MCR provides guaranteed bandwidth for PVCs, control VCs, or WAN SVCs while allowing sufficient bandwidth for SVCs to operate.
- To be useful, the SCR must not exceed the PCR.
- If you know the user average rate, set the SCR approximately 10 percent higher than this value.
- ATM VCs may fail to operate with SCR values lower than 128 cells/s.
- Entering 0 for the SCR turns off this function and specifies that the ATM router uses “best effort” for SCR.
- The E-3 framing mode setting affects the maximum SCR setting.

Using the MBS

The MBS specifies the maximum number of sequential cells allowed on a VC before that VC must relinquish bandwidth to other VCs waiting to transmit. This burst occurs at or close to the peak cell rate.

When setting the MBS, we suggest that you select a value larger than the largest packet your PVC or control VC can transmit (that is, the size of the maximum AAL CPCS transmit SDU). For example, if your VC accepts packets that are less than 4608 bytes long (PVC default), set your MBS value between 45 and 50 cells.

As a guideline, use this formula to determine your MBS value:

$$\frac{\text{Maximum packet size (in bytes)}}{\text{48 bytes/cell}} = \text{MBS value (in cells)}$$

For example:

$$\frac{\text{4608 bytes (default)}}{\text{48 bytes/cell}} = \text{96 cells}$$

ATM0016A

ARP and Inverse ARP Support

ATM supports the Address Resolution Protocol (ARP), enabling the router to dynamically resolve IP network layer protocol-to-VPI/VCI address mappings. ATM learns the address of the virtual circuit by detecting the virtual circuit that delivered the ARP response.

ATM also supports Inverse ARP. However, you can use Inverse ARP only if both the local and remote routers support it.

Nortel Networks uses both proprietary and standard ARP and Inverse ARP for PVCs that run IP. The method that the PVC uses depends on how you configure address resolution for the IP interface. See *Configuring IP, ARP, RARP, RIP, and OSPF Services* for additional information about configuring address resolution.

Nortel Networks uses standard ARP and Inverse ARP for SVCs running classical IP (RFC 1577) and SVCs running LAN emulation.

ATM Error Checking

ATM verifies that the VPI/VCI is valid with respect to the PVCs configured for the ATM circuit. It also verifies the header format. ATM verifies valid SVC connection through signaling messages.

Simulated Multicast Packet Support

Simulated multicasting is generally used in certain address resolution techniques and for applications that require the delivery of identical information to multiple recipients. Nortel Networks ATM routers simulate multicasting by sending a copy of the multicast or broadcast packet to every available virtual circuit on a particular logical interface.

Converting Mb/s to Cells/s

Several ATM traffic parameters require you to enter values in cells per second (cells/s). To convert to cells/s, divide the number of bits/s by 424 (the number of bits per ATM cell).

$$\frac{\textit{Number of bits/second}}{\textit{Number of bits/ATM cell}} = \textit{Number of cells/second}$$

For example:

$$\frac{\textit{100,000,000 bits/s}}{\textit{424 bits/cell}} = \textit{235,849 cells/s}$$

ATM0021A

Classical IP over ATM Concepts

RFC 1577, *Classical IP and ARP over ATM*, describes an administrative entity within an ATM network called a logical IP subnet (LIS). Each ATM LIS consists of multiple network devices -- hosts and routers -- connected to the ATM network and configured with interfaces to the same IP subnet.

Each LIS operates and communicates independently in an ATM network. A host connected to an ATM network communicates directly with other hosts in its own LIS. To communicate with hosts in another LIS, the host must use an IP router. This router can connect to multiple LISs.

An ATM LIS must meet the following requirements:

- All members of the LIS (hosts and routers) must have the same IP network/ subnet address and mask.
- All members must be directly connected to the ATM network using SVCs.
- All members must access hosts outside the LIS through a router.
- All members must be able to communicate by means of ATM with every other member of the LIS (that is, the virtual connection topology must be fully meshed).

An ATM LIS can replace an IP LAN. In Figure 1-11, for example, three IP host systems and an IP router have interfaces to an Ethernet LAN. To communicate with each other on the LAN, the devices use the MAC addresses that they obtain using ARP or static routes. For communication beyond the LAN, the devices use IP addresses.

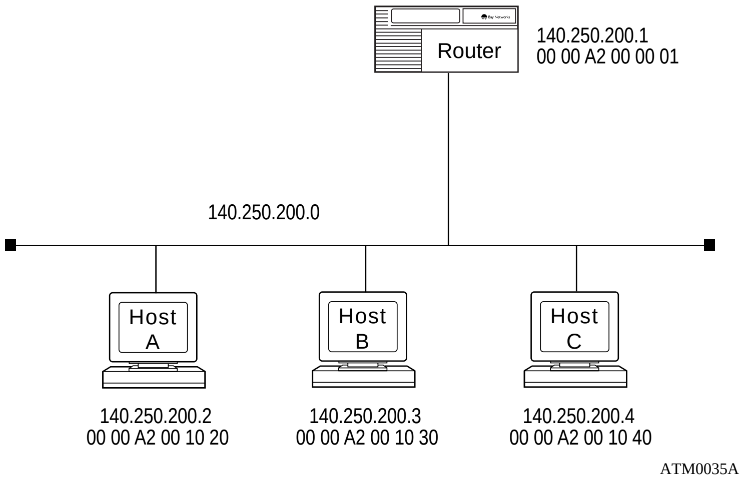


Figure 1-11. IP Local Area Network

In Figure 1-12, an ATM network replaces the LAN interfaces, creating a LIS. For communication within the LIS, the devices use ATM addresses obtained using ATMARP; for communication beyond the LIS, the devices use IP addresses.

For example, to send a message to host B, host A uses host B's ATM address. To send a message to a host beyond the LIS, host A uses an IP address to identify the remote host and sends the message to the local router (router A), using the router's ATM address. The router then forwards the message.

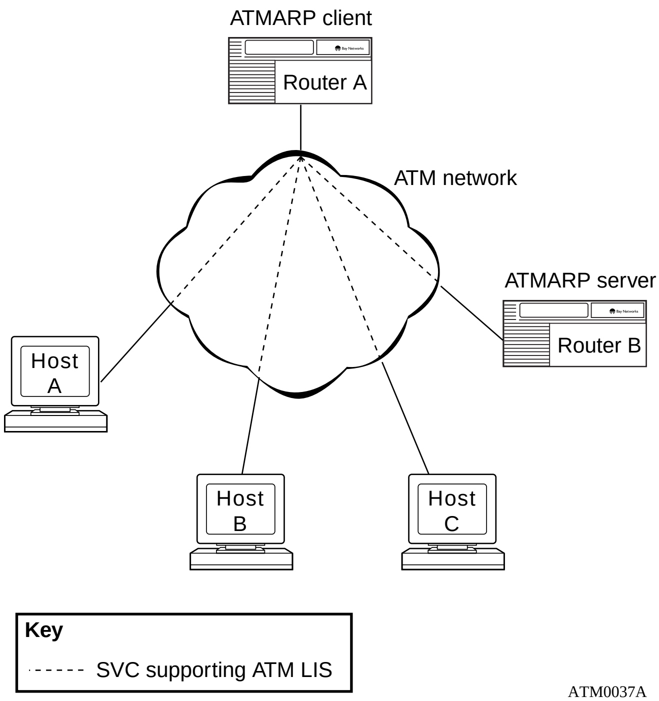


Figure 1-12. IP Logical IP Subnet

ATM Address Resolution

An address resolution protocol defines a mechanism that enables an IP router to use the IP address of a network device to learn the physical address of that device. An Ethernet LAN uses ARP as its address resolution scheme. A LIS uses an address resolution scheme called ATMARP as defined by RFC 1577.

On a LAN, defined as a broadcast medium, a router obtains the physical address of a network device by broadcasting an ARP request. In a LIS, which uses a nonbroadcast ATM medium, a router sends an ATMARP request to an ATMARP server.

Each IP interface on the LIS opens a VC to the ATMARP server and registers its IP address and ATM address (Figure 1-12 on page 1-30). Using this information, the server builds and maintains a table that maps LIS IP addresses to ATM addresses.

A router that needs the ATM address of a host on the LIS sends an ATMARP request to the server. When the server returns a response containing the address, the router extracts the ATM address of the host from the response and opens an SVC directly to the host using ATM UNI signaling.

If the server does not have an entry for the requested IP address, it returns a negative acknowledgment, signifying that the destination is unreachable.

Configuring an ATM Service Record for ATMARP

When configuring a service record to act as an ATMARP client or server:

- Define a classical IP service record.
  - -- Specify SVC as the virtual circuit type for the service record. All network devices on a LIS must connect over SVCs.
  - -- Specify LLC/SNAP or NULL as the encapsulation type for the service record. RFC 1577 defines LLC/SNAP as the encapsulation type for ATMARP.

  For more information about how to create an SVC service record to run classical IP, see Chapter 2, "Starting ATM and ATM Router Redundancy."
- Add IP and IP routing protocols to the circuit.
- Configure ATMARP Mode as either a client or a server.

  For a description of the ATM-specific IP parameters necessary for classical IP ATMARP operation over ATM, see "ATMARP Parameters" on page A-80.

For full compatibility with RFC 1577, you may have to specify a maximum transmission unit (MTU) size of 9188 bytes. See "Defining the Interface MTU" on page 3-3 (for the BCC) or the Site Manager Interface MTU parameter description on page A-5 for additional information about setting the MTU size.

When configuring the router as a client, you must define the server switch address. The client sends ATMARP requests to the server switch address.

Note: If you remove and replace a link module that is configured as an ATMARP client, the client loses connectivity until the ATMARP server registration refresh interval for that client expires (900-second default). This loss of connectivity occurs only when the client is configured to autogenerate the ATM address user part (see "Disabling and Reenabling User Part Autogeneration" on page 6-4 for additional information about autogenerating ATM addresses).

Configuring an ATM Address for an Adjacent Host

An adjacent host is a network device on the local LIS. You must configure an ATM address for all hosts on the LIS that do not use ATMARP.

For a description of the IP parameters required for creating adjacent hosts in a classical IP over ATM environment, see "Adjacent Host Parameters" on page A-82.

For more information about adding, editing, and deleting adjacent hosts, see *Configuring IP, ARP, RARP, RIP, and OSPF Services.*

ATM LAN Emulation Concepts

LAN emulation allows virtual communication of traditional LAN devices and applications over an ATM network. An ATM network can run one or more emulated LANs. However, each emulated LAN is independent of the others and devices cannot communicate directly across emulated LAN boundaries.

Note: Communication between emulated LANs is possible through routers and bridges only (possibly implemented on the same end station).

This section provides general information about LAN emulation as described by the ATM Forum. For more information about LAN emulation, refer to the ATM Forum document *LAN Emulation Over ATM* (Version 1.0).

For instructions on how to customize LAN emulation on your ATM router, see Chapter 7, "Customizing LAN Emulation Service Records and Clients."

LAN Emulation Connectivity

An emulated LAN can provide Ethernet (IEEE 802.3) or token ring (IEEE 802.5) connectivity. With an emulated Ethernet or token ring network over ATM, software applications can interact as if they were connected to a traditional LAN.

LAN Emulation Components

Each ATM domain contains a LAN emulation configuration server (LECS). Each emulated LAN comprises a group of LAN emulation clients (LECs), a LAN emulation server (LES), and a broadcast and unknown server (BUS). These servers provide specific LAN emulation services.

LAN Emulation Configuration Server

The LAN emulation configuration server (LECS) assigns individual LE clients to different emulated LANs. The LECS does this by giving the client the ATM address of the LAN emulation server (LES). This method allows you to assign a client to an emulated LAN based on the client's physical location (ATM address) or the identity of a LAN destination it represents.

LAN Emulation Clients

The LAN emulation client (LE client or LEC) is the interface, or virtual portion of an interface, through which an end station forwards data, resolves addresses, and provides other control functions. The LE client provides the MAC-level emulated Ethernet or token ring service interface to the upper-layer protocol. It also controls the LAN emulation UNI (LUNI) interface when communicating with other devices on the emulated LAN.

The LE client uses the configuration protocol to obtain information from the LECS. This protocol allows the LE client to locate the LES and set up a bidirectional, control direct virtual channel connection. The LE client automatically obtains all of the necessary configuration data (including the LES address) from the LECS.

LAN Emulation Server

The LES controls and coordinates LE client access to the emulated LAN. When an LE client joins an emulated LAN, it registers its ATM address with the LES. When the LES obtains the ATM address of the LE client, it also obtains the client's physical location (from the MAC address or route descriptor).

LE clients query the LES to obtain the ATM address associated with a specific MAC address or route descriptor. After an LE client receives the ATM address of the LE client it wants to reach, the individual clients communicate directly.

Broadcast and Unknown Server

To emulate a traditional LAN, the emulated LAN must provide the connectionless data delivery of a shared network to its LE clients and be able to handle broadcast and multicast data. The broadcast and unknown server (BUS) fulfills this requirement by distributing all broadcast, multicast, and unknown traffic to and from all LE clients on an emulated LAN.

For example, when an LE client sets up its initial configuration, it obtains the MAC address of the BUS from the LES. Using this MAC address, the LE client sets up a multicast send virtual channel connection (VCC) to the BUS. In turn, the BUS registers the LE client as part of its emulated LAN.

To broadcast data, an LE client uses the multicast send VCC to transmit information to the BUS. The BUS then retransmits the data, through multiple point-to-point connections or one point-to-multipoint connection, to each LE client on the emulated LAN.

Redundant LES/BUS

Nortel Networks ATM routers support LAN emulation server (LES) and broadcast and unknown server (BUS) redundancy. This redundancy reduces the risk of network failure by overcoming a single point of failure in accessing the LES.

LAN Emulation States

As defined in the ATM Forum *LAN Emulation Over ATM* specification, LE clients enter various states of communication while attempting to join an emulated LAN. These states (referred to as “phases” by the ATM Forum) indicate the progress of an LE client as it connects with an emulated LAN (Figure 1-13).

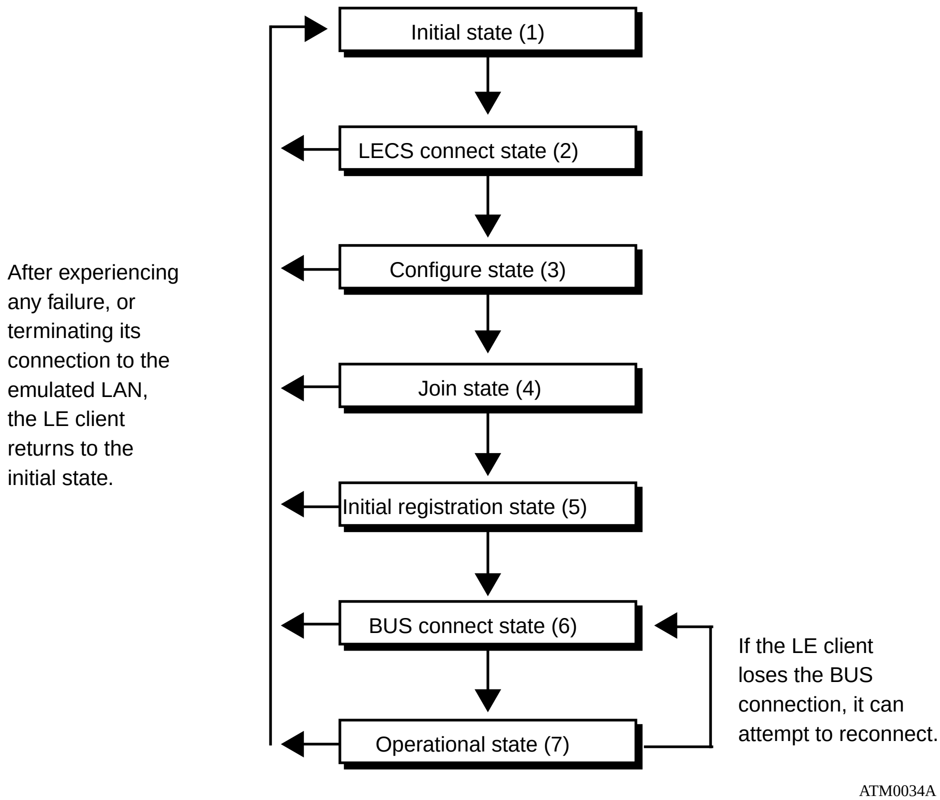


Figure 1-13. LAN Emulation States

Note: The numbers that follow each state appear in the ATM LEC status record (wfAtmLecStatusEntry).

The following sections briefly describe each LAN emulation state. Refer to the ATM Forum *LAN Emulation Over ATM* specification for more information about LAN emulation states.

Initial State

An LE client always starts in the initial state before attempting to connect to the LECS.

LECS Connect State

An LE client enters the LECS connect state when it attempts to connect to the LECS.

Configure State

An LE client enters the configure state when it attempts to retrieve the necessary information (that is, the ATM address of the LES, LAN type, LAN name, Maximum MTU, and various timeout values) required to join an emulated LAN.

Join State

An LE client enters the join state when it attempts to join an emulated LAN. Joining an emulated LAN requires that the LE client:

- Set up a control VCC to communicate with the LES.
- Send a join request (containing the client MAC address) to the LES.
- Accept a control distributed VCC to receive control data from the LES.
- Receive a valid join response from the LES containing a LAN emulation client ID (LECID).

Note: Only one ATM LE client per Nortel Networks ATM router can join an emulated LAN at any point in time. However, you can always move a LAN emulation client to the appropriate emulated LAN using network management software.

Initial Registration State

An LE client enters the initial registration state when it attempts to register multiple MAC addresses with the LES.

Note: The router LE client provides the MAC address only for its own ATM interface. Because it does not register multiple MAC addresses, the router never enters this state. The router LE client acts as a proxy for bridge MAC addresses not learned on this circuit.

BUS Connect State

An LE client enters the BUS connect state when it attempts to set up a VCC to the BUS.

Operational State

An LE client enters the operational state after successfully completing the requirements to join an emulated LAN.

ATM Router Redundancy Concepts

Nortel Networks ATM routers support warm standby router redundancy. This redundancy protects a network from the irrecoverable failure of an entire ATM router. You configure routers to be members of a router redundancy group.

Figure 1-14 illustrates router redundancy in a Nortel Networks ATM environment.

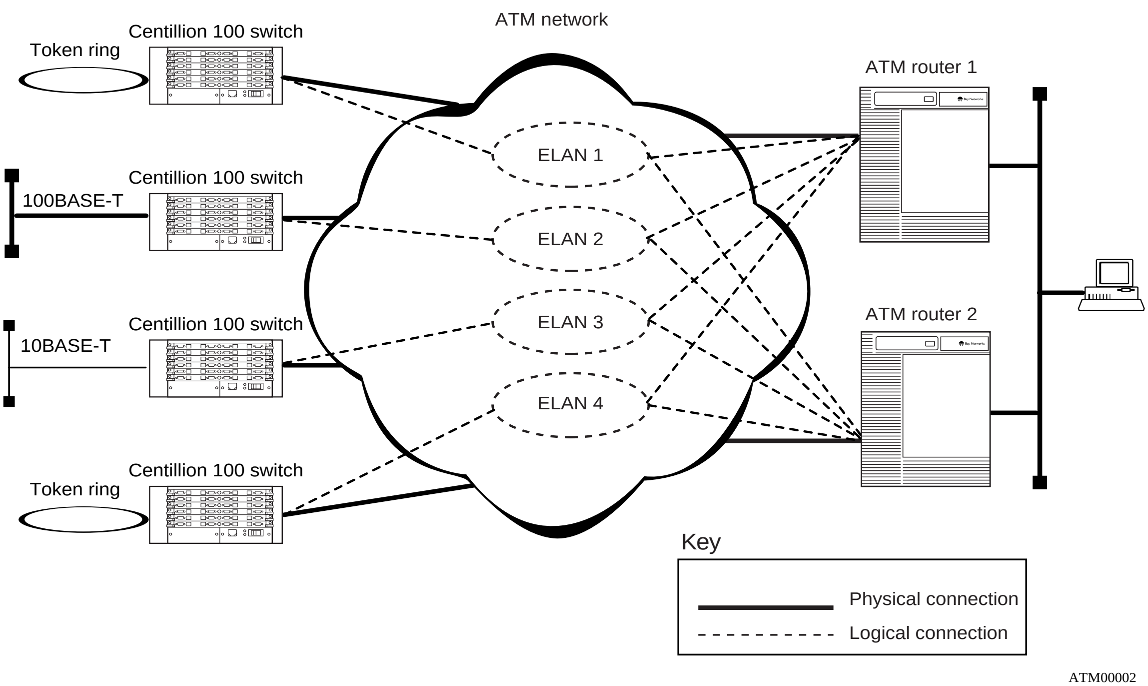


Figure 1-14. Router Redundancy

Router redundancy requires at least two routers to be members of a router redundancy group. One router acts as the primary router and provides normal routing/bridging services. The other router acts as the secondary, backup router and takes over if the primary router fails.

All members of an ATM router redundancy group must have the following characteristics:

- Be the same ATM router type, for example, BCN®, BLN®, or System 5000™.
- Have the same hardware configuration, including CPU and interface module types, and slot and port locations of the backed-up interfaces.
- Have the same software configuration. That is, you must be running the same router software version and have the same loadable modules configured.
- Contain both a primary configuration file and a secondary configuration file.
- Have at least one legacy LAN connection between the routers in the redundancy group.

Note: Nortel Networks recommends at least two legacy LAN connections between routers in the redundancy group.

WAN SVC Concepts

ATM WAN SVCs provide an SVC connection that the router dynamically establishes for data transfer and then tears down after a configurable inactive period of time. When configuring ATM WAN SVCs, you provide a static mapping of an ATM address to IP or IPX protocol addresses on the same service record.

This section provides general information about ATM WAN SVCs.

For instructions on how to create a WAN SVC service record, see “Adding a Service Record for WAN SVCs” on page 2-11. For instructions on how to customize WAN SVCs on your ATM router, see Chapter 8, “Customizing WAN SVC Service Records and WAN SVCs.”

Creating a Network of Adjacent Hosts

You can create a network of routers that are connected by ATM WAN SVCs by configuring IP or IPX adjacent hosts. On each router, you should configure the following:

- One WAN SVC service record for each IP subnet or IPX subnetwork
- Adjacent host entries for each router in the same subnet

Each adjacent host you configure has a static mapping to an ATM address. Once you have configured adjacent hosts, you can specify PCR and SCR settings for the WAN SVCs to any particular adjacent host by configuring the traffic shaping parameters.

For information about how to configure traffic shaping, see "Enabling Traffic Parameters" on page 8-8.

Routing Updates

The way the router sends routing updates over a WAN SVC differs depending on the number of adjacent hosts per circuit. If you have configured only one adjacent host per circuit, Nortel Networks recommends that you set the routing mode to dial-optimized so that the router sends routing updates only when data traffic causes the router to establish an SVC to the adjacent host.

When you have configured multiple adjacent hosts per circuit, the router should send routing updates periodically to ensure that all hosts in the subnet have complete knowledge of the network topology. In this case, you should use the normal routing mode instead of dial-optimized routing.

For more information about configuring routing updates, see "Changing the Routing Update Policy" on page 8-5.

PVC Operations and Management Concepts

In most ATM networks, if a PVC fails, the remote device does not receive notification of the failure at the ATM layer. Instead, the device receives this information from a non-ATM source such as a routing protocol that operates above the ATM layer. The PVC Operations and Management (OAM) feature provides a mechanism by which ATM devices can receive prompt failure information.

PVC OAM has two methods of detecting PVC failure: loopback and alarms. You can use either of these methods separately or both methods together. When using OAM loopback cells, the time can decrease to only a few seconds; when using OAM alarms, the detection is almost instantaneous.

OAM Loopback

The OAM loopback method uses loopback cells to detect a lost connection. When OAM loopback is enabled, the PVC sends loopback cells at a designated interval. If a remote device does not return loopback responses, and the PVC loses a specified number of cells, the service record alerts the upper-layer protocol that the link is down. The PVC continues to send OAM loopback cells over the service record. When it receives a specified number of OAM loopback responses, it declares the link operational and begins sending traffic again.

Note: For OAM loopback to function properly, you must configure it on all PVCs on an interface. Link status is based on the OAM loopback status of all PVCs on the interface.

OAM Alarms

If the ATM router connects to an ATM switch that uses OAM alarms, you can enable alarm detection on the ATM router. With OAM alarms enabled, when the router receives an alarm indication signal (AIS) alarm from the switch, it alerts the upper-layer protocol that the ATM link is down; it does not wait for an OAM loopback response from the remote device.

After receiving an AIS alarm, the router sends a remote defect indication (RDI) response to the switch to indicate that it received the alarm. The switch continues to send AIS alarms until the link is operational again. If the router does not receive an AIS alarm for 3 seconds, it declares the link operational and begins sending traffic again.

For More Information

For more information about ATM, refer to the following documents:

ATM Forum. *ATM User-Network Interface Specification.* Version 3.0. September 1993.

ATM Forum. *LAN Emulation Over ATM*. Version 1.0. January 1995.

Bellcore Document SR-NWT-001763, Issue 1. *Preliminary Report on Broadband ISDN Transfer Protocols*. December 1990.

———, FA-NWT-001109. *Broadband ISDN Transport Network Elements Framework Generic Criteria*. December 1990.

———, FA-NWT-001110. *Broadband ISDN Switching System Framework Generic Criteria.* December 1990.

De Prycker, M. *Asynchronous Transfer Mode: Solution for Broadband ISDN*. Ellis Horwood Limited, 1991.

Grossman, D., E. Hoffman, F. Liaw, A. Malis, A. Mankin, and M. Perez. *ATM Signaling Support for IP over ATM*. RFC 1755. Network Working Group. February 1995.

Handel, R., and M. Huber. *Integrated Broadband Networks: An Introduction to ATM-Based Networks*. Reading, Mass.: Addison-Wesley, 1991.

Heinanen, J. *Multiprotocol Encapsulation over ATM Adaptation Layer 5*. RFC 1483. Network Working Group. July 1993.

ITU-T. *B-ISDN -- ATM Adaptation Layer -- Service Specific Connection Oriented Protocol (SSCOP)*. Final Draft. March 10, 1994.

Laubach, M. *Classical IP and ARP over ATM.* RFC 1577. Network Working Group. January 1994.

Where to Go Next

Use the following table to determine where to go next.

If you want to	**Go to**
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 2
Starting ATM and ATM Router Redundancy

This chapter describes how to create a basic ATM configuration by specifying values for required parameters only and accepting default values for all other parameters. This chapter contains the following information:

For overview information about ATM, see Chapter 1, “Understanding ATM, ATM Router Redundancy, and OAM.”

Starting Configuration Tools

Before configuring ATM, refer to the following user guides for instructions on how to start and use the Nortel Networks configuration tool of your choice.

Configuration Tool	User Guide
Bay Command Console (BCC)	*Using the Bay Command Console (BCC)*
Site Manager	*Configuring and Managing Routers with Site Manager*

Starting ATM Services

You can use the BCC or Site Manager to start ATM on the router using default values for all parameters.

Using the BCC

To start ATM on a router using the BCC:

1. Add ATM to the configuration.
2. Enable ATM signaling (if you plan to define either a LANE or classical IP service record).
3. Define an ATM service record.
4. If you defined a PVC service record, add at least one virtual circuit to that service record.
5. Enable protocols on the ATM service record.

Adding ATM to the Configuration

To add ATM to the configuration, navigate to the top-level prompt and enter:

atm slot *<slot_number>* [**module** *<module_number>*] **connector** *<connector_number>*

slot_number is the number of the chassis slot containing the link module.

module_number is a convention used for other routers within the System 5000 chassis. You need only enter a module number when configuring an ATM router in the System 5000 chassis (that is, the Model 5782 Centillion Multiprotocol Engine). The module number for the ATM router is always 1.

connector_number is the number of a connector on the link module.

Note: The top-level prompt for BCC configuration on the System 5000 platform is “stack.” However, the remainder of this guide uses the “box” prompt associated with the BN platform in its examples.

For example, the following command adds ATM to the BN configuration on slot 5, connector 1:

```
box# atm slot 5 connector 1
atm/5/1#
```

Enabling Signaling (LANE and Classical IP Service Records Only)

To enable signaling on an ATM interface, navigate to the ATM prompt and enter:

signaling

For example, the following command enables UNI V3.0 (default) signaling on slot 5, connector 1:

```
atm/5/1# signaling
signaling/5/1#
```

Defining an ATM Service Record

Using the BCC, you can define PVC, classical IP, and LANE service records.

Defining PVC Service

To define a PVC service record, navigate to the ATM interface prompt and enter:

pvc-service *<service_name>* **encapsulation** *<encapsulation_type>*

service_name is a unique text string that you assign to the service record.

encapsulation_type is the data encapsulation type that you want the PVC service record to use.

For example, the following command defines a PVC service record with the name "boston" on ATM slot 5, connector 1:

```
atm/5/1# pvc-service boston encapsulation llc-snap
pvc-service/boston#
```

Note: You must add at least one PVC to a PVC service record. Go to "Adding PVCs" on page 2-4 for instructions.

Defining Classical IP Service

To define a classical IP service record, navigate to the ATM interface prompt and enter:

classical-ip-service *<service_name>* **encapsulation** *<encapsulation_type>*

service_name is a unique text string that you assign to the service record.

encapsulation_type is the data encapsulation type that you want the classical IP service record to use.

For example, the following command defines a classical IP service record with the name "dallas" on ATM slot 5, connector 1:

```
atm/5/1# classical-ip-service dallas encapsulation llc-snap
classical-ip-service/dallas#
```

Defining LEC Service

To define a LAN emulation client (LEC) service record, navigate to the ATM interface prompt and enter:

lec-service *<service_name>*

service_name is a unique text string that you assign to the service record.

For example, the following command defines a LEC service record with the name "newyork" on ATM slot 5, connector 1:

```
atm/5/1# lec-service newyork
lec-service/newyork#
```

Adding PVCs

You must add at least one PVC to a PVC service record for that service record to operate. A PVC is defined by its VPI/VCI pair.

A *virtual path* is a set of virtual channels between a common source and destination. The virtual channels within a virtual path logically associate with a common identifier. This identifier is called the virtual path identifier (VPI) and is part of the cell header.

A *virtual channel* is a logical connection between two communicating ATM entities. Each virtual channel can carry a different protocol or traffic type. The virtual channel transports cells that have a common identifier. The identifier is called the virtual channel identifier (VCI) and is part of the cell header.

Note: ATM does not allow duplicate VPI/VCI pairs on the same physical interface (that is, on the same link module). However, duplicate VPI/VCI pairs can exist on different physical interfaces (that is, on different link modules).

To add a PVC to a PVC service record, navigate to the ATM PVC service prompt and enter:

pvc vpi *<vpi_number>* **vci** *<vci_number>*

vpi_number identifies the virtual path of the PVC. The header can contain a maximum of 8 VPI bits for a UNI connection. This bit range allows for path identifiers from 0 to 255.

vci_number identifies the virtual channel of the PVC. The header can contain a maximum of 16 VCI bits. This bit range allows for channel identifiers from 32 to 65535.

Note: Following the recommendation of the ATM Forum, virtual channel identifiers from 0 to 31 are reserved for signaling and added functionality.

For example, the following command adds PVC 0/130 to the configuration on PVC service record boston:

```
pvc-service/boston# pvc vpi 0 vci 130
pvc/0/130#
```

Adding Protocols to an ATM Service Record

The BCC currently supports only IP and IPX configuration over ATM. Table 2-1 indicates which service records support the IP and IPX protocols.

Table 2-1. Service Record Protocol Support

Service Record Type	IP	IPX
pvc-service	✓	✓
classical-ip-service	✓	
lec-service	✓	✓

Adding IP

To add IP to a service record, navigate to the ATM service record prompt (for classical IP or LEC service records), or the ATM PVC to which you want to add IP, and enter:

ip address *<address>* **mask** *<mask>*

address and *mask* are a valid IP address and its associated subnet mask, expressed in either dotted-decimal notation or in bit notation.

For example, the following command configures an IP address of 2.2.2.2 and a subnet mask of 255.255.255.0 on ATM PVC 0/130:

```
pvc/0/130# ip address 2.2.2.2 mask 255.255.255.0
ip/2.2.2.2/255.255.255.0#
```

Adding IPX

To add IPX to a service record, navigate to the ATM service record prompt (for LEC service records), or the ATM PVC to which you want to add IPX, and enter:

ipx address *<address>*

address is a valid IPX address expressed in either dotted-decimal notation or in bit notation.

For example, the following command configures an IPX address of 0000001a on ATM PVC 0/130:

```
pvc/0/130# ipx address 0000001a
ipx/0000001a#
```

Using Site Manager

To start ATM on a router using Site Manager:

1. Create an ATM circuit.
2. Define an ATM service record.
3. Enable protocols on the ATM service record.
4. If you defined a PVC service record, add at least one virtual circuit to that service record.

Creating an ATM Circuit

To create an ATM circuit, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Add Circuit window opens.
2. Click on **OK** to accept the default circuit name.	The Select Connection Type window opens.
3. Click on **ATM**.	The Initial ATM Signaling Config window opens.
4. Click on **OK** to accept the default settings.	The Edit ATM Connector window opens.
5. Go to the next section to define a service record on the circuit.	

Note: Accepting the defaults in the Initial ATM Signaling Config window enables signaling on the interface. If you are running only PVCs on the interface, you do not need signaling enabled.

Defining an ATM Service Record

The Configuration Manager allows you to define service records for a specific data encapsulation type. Depending on the data encapsulation type you choose, the Configuration Manager also allows you to select a PVC, SVC or WAN SVC connection type for that service record.

Caution: You cannot edit the Data Encapsulation Type or Virtual Connection Type parameters after you assign them to a service record. However, you can edit the Data Encapsulation Type for individual PVCs.

Table 2-2 identifies which data encapsulation types you can apply to permanent and switched virtual circuits. For an explanation of the different data encapsulation types, and rules for assigning data encapsulation, see Chapter 1, "Understanding ATM, ATM Router Redundancy, and OAM."

Table 2-2. Valid Data Encapsulation Types for PVCs, SVCs and WAN SVCs

Data Encapsulation Type	Permanent Virtual Circuit	Switched Virtual Circuit	WAN Switched Virtual Circuit
LANE		✓	
LLC/SNAP	✓	✓	✓
NLPID	✓		
NULL	✓	✓	

Adding a Service Record for PVCs

Note: The values for some parameters depend on the values of others. If you change one parameter, you must press the Enter or Tab key to advance from one parameter cell to another. Pressing either key acknowledges any changes to a parameter. If you neglect this step, the Configuration Manager may not provide the appropriate options for other parameters.

To add a service record for PVCs, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on **Add**.	The ATM Service Record Parameters window opens.
5. Set the **Data Encapsulation Type** parameter to **LLC/SNAP**, **NLPID**, or **NULL**. Click on **Help** or see the parameter description on A-15.	
6. Press the **Enter** or **Tab** key to advance to the Virtual Connection Type parameter.	
7. Change the **Virtual Connection Type** parameter to **PVC**. Click on **Help** or see the parameter description on page A-15.	
8. Click on **OK**.	The Select Protocols window opens.
9. Go to "Enabling Protocols on an ATM Service Record" on page 2-13.	

Adding a Service Record for Classical IP

To add a service record for classical IP, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on **Add**.	The ATM Service Record Parameters window opens.
5. Set the **Data Encapsulation Type** parameter to **LLC/SNAP** or **NULL**. Click on **Help** or see the parameter description on page A-15.	
6. Click on **OK**.	The Select Protocols window opens.
7. Go to "Enabling Protocols on an ATM Service Record" on page 2-13.	

Adding a Service Record for LANE

To add a service record for LANE, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on **Add**.	The ATM Service Record Parameters window opens.
5. Click on **OK**.	The Select Protocols window opens.
6. Go to the next section, "Enabling Protocols on an ATM Service Record."	

Adding a Service Record for WAN SVCs

Note: The values for some parameters are contingent on the values of others. If you change one parameter, you must press the Enter or Tab key to advance from one parameter cell to another. Pressing either key acknowledges any changes to a parameter. If you neglect this step, the Configuration Manager may not provide the appropriate options for other parameters.

To add a service record for WAN SVCs, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on **Add**.	The ATM Service Record Parameters window opens.
5. Set the **Data Encapsulation Type** parameter to **LLC/SNAP**. Click on **Help** or see the parameter description on A-15.	
6. Press the **Enter** or **Tab** key to advance to the Virtual Connection Type parameter.	
7. Change the **Virtual Connection Type** parameter to **MUXED_SVC**. Click on **Help** or see the parameter description on page A-15.	
8. Change the **WAN SVC Routing Mode** to **Normal** or **Dial-Optimized**. Click on **Help** or see the parameter description on page A-15.	
9. Click on **OK**.	The Select Protocols window opens.
10. Go to "Enabling Protocols on an ATM Service Record" on page 2-13.	

Note: After you create a WAN SVC service record, to complete the WAN SVC configuration you must also configure IP or IPX adjacent host entries for all routers to be connected to this router with WAN SVCs. For information about how to configure an IP adjacent host, see *Configuring IP, ARP, RARP, RIP, and OSPF Services*. For information about how to configure an IPX adjacent host, see *Configuring IPX Services*.

Enabling Protocols on an ATM Service Record

Depending on the data encapsulation type and virtual connection type (PVC or SVC) that you choose for the service record, the router supports various protocols.

You can select and configure protocols immediately after you create a service record, or you can exit the Select Protocols window and add protocols at a later time.

Adding Protocols Immediately After Creating a Service Record

To add protocols to a service record immediately after creating it, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Select Protocols window, click on the protocols you want to add.	A check mark appears in the box for each protocol that you select.
2. Click on **OK**.	For each protocol you select, the Configuration Manager displays a protocol-specific window prompting you for required information. Click on **Help** for any parameter, or see the appropriate protocol-specific guide.

Adding Protocols to an Existing Service Record

To add protocols to an existing service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the service record to which you want to add protocols.	The Protocols menu selection becomes active.
5. Click on **Protocols**.	The Protocols menu opens.
6. Choose **Add/Delete**.	The Select Protocols window opens.
7. Click on the protocols that you want to add.	A check mark appears in the box for each protocol that you select.
8. Click on **OK**.	For each protocol you select, the Configuration Manager displays a protocol-specific window prompting you for required information. Click on **Help** for any parameter, or see the appropriate protocol-specific guide.

Adding PVCs

You must add at least one virtual circuit to a PVC service record for that service record to operate. When you finish configuring the protocols for a PVC service record, the ATM Virtual Channel Link window opens.

To add a PVC to a PVC service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record to which you want to add a virtual circuit.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on **Add**.	The ATM Virtual Channel Link Parameters window opens.
7. Set the **VPI Number** parameter. Click on **Help** or see the parameter description on A-21.	
8. Set the **VCI Number** parameter. Click on **Help** or see the parameter description on page A-21.	
9. Click on **OK**.	You return to the ATM Virtual Channel Link window.
10. Click on **Done**.	You return to the ATM Service Records List window.
11. Click on **Done**.	You return to the Edit ATM Connector window.
12. Click on **Done**.	You return to the Select Connection Type window.
13. Click on **Done**.	You return to the Configuration Manager window.

Starting ATM Router Redundancy

This section describes how to start ATM router redundancy. For more information about ATM router redundancy, see “ATM Router Redundancy Concepts” on page 1-39. For general information about router redundancy and detailed descriptions of router redundancy parameters, see *Configuring Interface and Router Redundancy.*

Note: You can configure router redundancy in Site Manager local mode only.

To configure router redundancy, you first create a template router redundancy group configuration file. After creating this group configuration file, you then use it to create each member configuration file twice: once as a primary file, which the router uses when it boots as the primary member of the redundancy group, and again as a secondary file, which the router uses in its role as a secondary member.

Note: The Clear function allows you to clear all protocols from all circuits on which you configured router redundancy. The Clear function does not, however, delete the configured router redundancy information.

The Clear function is useful when converting a primary router redundancy configuration file to a secondary configuration file, because a typical secondary configuration does not include any of the protocols contained in the primary configuration.

Creating a Group Configuration File

To create a redundancy group configuration file template, complete the following steps. All group members will use the values you configure in this file.

Site Manager Procedure	
You do this	**System responds**
1. In the Site Manager window, choose **Tools**.	The Tools menu opens.
2. Choose **Router Redundancy**.	The Router Redundancy menu opens.
3. Choose **Group Configuration**.	The file selection window opens.
4. Enter *template.cfg* as the file name.	
5. Click on **OK**.	The Select Router Model window opens.
6. Select a router and click on **Confirm**.	The Configuration Manager window opens.
7. Click on an empty slot.	The Module List window opens.
8. Choose a LAN module (for example, Ethernet, token ring, or FDDI) and click on **OK**.	The Configuration Manager window opens.
9. Click on the connector you want to configure for router redundancy.	The Add Circuit window opens.
10. Click on **OK**.	The Select Protocols window opens.
11. Select **Router Redundancy**. You can also select other protocols that you want to configure.	
12. Click on **OK**.	Site Manager asks if you want to add VLAN circuits.
13. Click on **No**.	The Router Redundancy Circuit window opens.
14. Set the **Primary MAC Address** parameter. Click on **Help** or see *Configuring Interface and Router Redundancy* for details.	
15. Click on **OK**.	The R.R. Group Global Parameters Configuration window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
16. Set the **Bid Duration** parameter to at least 90 seconds. Click on **Help** or see the parameter description in *Configuring Interface and Router Redundancy.*	
17. Click on **OK**.	The Configuration Manager window opens.
18. Click on the slot that contains the ATM module.	The Module List window opens.
19. Choose the ATM module type that resides on the router and click on **OK**.	The Configuration Manager window opens.
20. Click on the **ATM1** connector that you want to configure for router redundancy.	The Add Circuit window opens.
21. Click on **OK**.	The Select Connection Type window opens.
22. Click on **ATM**.	The Initial ATM Signaling Config window opens.
23. Click on **OK**.	The Edit ATM Connector window opens.
24. Click on **Configure ATM Router Redundancy**.	The Router Redundancy Circuit window opens.
25. Click on **OK**.	You return to the Edit ATM Connector window.
26. Click on **Done**.	You return to the Select Connection Type window.
27. Click on **Done**.	You return to the Configuration Manager window.
28. Click on **File**.	The File menu opens.
29. Choose **Save**.	You return to the Configuration Manager window.

For detailed descriptions of router redundancy parameters not described in this section, see *Configuring Interface and Router Redundancy.*

Creating Member Configuration Files

After creating a group configuration file, you use that file to create a primary and secondary configuration file for each member of an ATM router redundancy group.

Creating a Primary Configuration File

To create a primary configuration file, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Site Manager window, choose **Tools**.	The Tools menu opens.
2. Choose **Router Redundancy**.	The Router Redundancy menu opens.
3. Choose **Member Configuration**.	The file selection window opens.
4. Select the group configuration file, *template.cfg*.	
5. Click on **Open File**.	The Configuration Manager window opens.
6. Choose **Protocols**.	The Protocols menu opens.
7. Choose **Router Redundancy**.	The Router Redundancy menu opens.
8. Choose **Member Configuration**.	The R.R. Member Global Parameters Configuration window opens.
9. Click on **OK**.	The Configuration Manager window opens.
10. Choose **File**.	The File menu opens.
11. Choose **Save As**.	The Save Configuration File window opens.
12. Enter a file name (for example, *alpha.pri*) and click on **Primary Save**.	You return to the Configuration Manager window.

Creating a Secondary Configuration File

To create a secondary configuration file, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Site Manager window, choose **Tools**.	The Tools menu opens.
2. Choose **Router Redundancy**.	The Router Redundancy menu opens.
3. Choose **Member Configuration**.	The file selection window opens.
4. Select the primary configuration file.	
5. Click on **Open File**.	The Configuration Manager window opens.
6. Choose **Protocols**.	The Protocols menu opens.
7. Choose **Router Redundancy**.	The Router Redundancy menu opens.
8. Choose **Member Configuration**.	The R.R. Member Global Parameters Configuration window opens.
9. Set the **Primary Configuration File Path** parameter. Click on **Help** or see *Configuring Interface and Router Redundancy* for details.	
10. Click on **OK**.	The Configuration Manager window opens.
11. Choose **Protocols**.	The Protocols menu opens.
12. Choose **Router Redundancy**.	The Router Redundancy menu opens.
13. Choose **Clear**.	Site Manager clears all protocols except router redundancy from circuits with router redundancy configured.
14. Choose **File**.	The File menu opens.
15. Choose **Save As**.	The Save Configuration File window opens.
16. Enter a file name (for example, *alpha.sec*) and click on **Secondary Save**.	You return to the Configuration Manager window.

Downloading Member Configuration Files to the Routers

After creating a primary and secondary configuration file for each member of an ATM router redundancy group, you must download those files to each router.

See *Configuring and Managing Routers with Site Manager* for instructions on downloading files.

When downloading the configuration files, keep the following in mind:

- Nortel Networks recommends that the routers all have the same primary and secondary configurations.
- You should name the secondary configuration file *config*. The router boots using the *config* file if it restarts.
- Each router must have a unique member ID.
- Each router should have a unique priority.

If the primary and secondary routers have identical configurations, you can repeat the primary and secondary file configurations, using a different member ID. If the configurations differ, you can modify the nonredundant parts of the configuration before saving the configuration file.

Deleting ATM from the Router

You can use the BCC or Site Manager to delete ATM from the router.

Using the BCC

To delete ATM from the router, navigate to the ATM prompt and enter:

delete

For example, the following command deletes ATM from slot 5, connector 1:

```
atm/5/1# delete
box#
```

Using Site Manager

To delete ATM from the router using Site Manager, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on **Protocols**.	The Protocols menu opens.
2. Choose **ATM**.	The ATM menu opens.
3. Choose **Delete ATM**.	Site Manager asks whether you really want to delete ATM.
4. Click on **OK**.	Site Manager deletes ATM from the router. You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	**Go to**
Learn about ATM concepts.	Chapter 1
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 3
Customizing an ATM Interface

When you start ATM on the router, all parameters use their default values. Depending on the requirements of your network, you may want to change some of these values. This chapter describes how to customize interface (or "line") details and includes the following information:

Disabling and Reenabling the ATM Driver

By default, when you create an ATM circuit, the line driver is enabled. You can disable and reenable the line driver for the specific connector without removing the physical line from the ATM receptacle.

Using the BCC

To disable the line driver, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

state disabled

For example, the following command disables the line driver on the ATM connector:

```
atm/11/1# state disabled
atm/11/1#
```

To reenable the line driver, navigate to the prompt and enter:

state enabled

For example, the following command reenables the line driver on the ATM connector:

```
atm/11/1# state enabled
atm/11/1#
```

Using Site Manager

To disable or reenable the line driver, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to disable or reenable.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **Enable** parameter. Click on **Help** or see the parameter description on page A-5.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Defining the Interface MTU

The maximum transmission unit (MTU) is the largest possible unit of data that the physical medium can transmit. By default, the interface allows an MTU size of 4608 octets. This value can handle most packet sizes. However, you can set the MTU to any value from 1 to 9188 octets.

Using the BCC

To modify the interface MTU, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

mtu *<integer>*

integer is the MTU size in octets.

For example, the following command sets the MTU size to 9188 octets:

```
atm/11/1# mtu 9188
atm/11/1#
```

Using Site Manager

To modify the MTU value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **Interface MTU** parameter. Click on **Help** or see the parameter description on A-5.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Defining the Data Path Notify Function

The data path notify function specifies whether the router disables the interface between the driver and the higher-level software (the data path interface) when you disconnect the cable from the ATM interface.

If you enable this function (the default), when you disconnect the cable from the interface, the router disables the data path interface after a time you specify.

If you disable this function, the router does not disable the data path interface and continues to send information to the higher-level software.

When you enable the data path notify function, you can also change how long you want the ATM router to wait before disabling the data path interface. By default, when the state of the physical interface changes from operational to nonoperational, the router waits 1 second. However, you can set this timer to any value from 0 to 3600 seconds.

Using the BCC

To disable the data path notify function, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

dp-notify disabled

For example, the following command disables the data path notify function on the ATM interface:

```
atm/11/1# dp-notify disabled
atm/11/1#
```

To reenable the data path notify function, navigate to the atm prompt and enter:

dp-notify enabled

To change the data path notify timeout value, navigate to the atm prompt and enter:

dp-notify-timeout *<integer>*

integer is the amount of time (in seconds) that the router can wait before the data path notify function activates.

For example, the following command sequence reenables the data path notify function on the ATM interface and sets the data path notify timeout value to 2400 seconds:

```
atm/11/1# dp-notify enabled
atm/11/1# dp-notify-timeout 2400
atm/11/1#
```

Using Site Manager

To disable or reenable the data path notify function or to change the data path notify timeout value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **Data Path Enable** parameter. Click on **Help** or see the parameter description on A-6.	
4. Set the **Data Path Notify Timeout** parameter. Click on **Help** or see the parameter description on page A-6.	
5. Click on **OK**.	You return to the Select Connection Type window.
6. Click on **Done**.	You return to the Configuration Manager window.

Defining the SVC Inactivity Timeout

When you enable the SVC inactivity timeout function (the default), the router automatically terminates any SVCs that have not received or transmitted any cells. If you disable the SVC inactivity timeout function, all SVCs on the line remain open until you close them by another method.

When enabled, the SVC inactivity timeout function also requires a timer value. This timer value specifies how long you want the ATM router to wait before disabling inactive SVCs. By default, if the router does not receive or transmit any cells for 1200 seconds, the inactive SVCs are disabled. However, you can set this timer to any value from 60 to 3600 seconds.

Using the BCC

To disable the SVC inactivity timeout function, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

vc-inactivity-control disabled

For example, the following command disables the SVC inactivity timeout function on the ATM interface:

```
atm/11/1# vc-inactivity-control disabled
atm/11/1#
```

To reenable the SVC inactivity timeout function, navigate to the atm prompt and enter:

vc-inactivity-control enabled

To change the SVC inactivity timeout value, navigate to the atm prompt and enter:

vc-inactivity-timeout *<integer>*

integer is the amount of time (in seconds) that the router can wait before it disables inactive SVCs.

For example, the following command sequence reenables the SVC inactivity timeout function on the ATM interface and sets the SVC inactivity timeout value to 2400 seconds:

```
atm/11/1# vc-inactivity-control enabled
atm/11/1# vc-inactivity-timeout 2400
atm/11/1#
```

Using Site Manager

To enable or disable the SVC inactivity timeout function or to modify the SVC inactivity timeout parameter, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **SVC Inactivity Timeout Enable** parameter. Click on **Help** or see the parameter description on page A-7.	
4. Set the **SVC Inactivity Timeout (Secs)** parameter. Click on **Help** or see the parameter description on page A-7.	
5. Click on **OK**.	You return to the Select Connection Type window.
6. Click on **Done**.	You return to the Configuration Manager window.

Assigning the Framing Mode

You can assign various framing modes to an ATM line, depending on the interface type your device uses. Refer to Table 3-1 to match the appropriate framing modes to the correct interface type. You can assign the following transceiver framing modes to the ATM line.

By default, the ATM line uses SONET framing for OC-3 interfaces, Cbit framing for DS-3 interfaces, and G.832 framing for E-3 interfaces.

Table 3-1. Supported Framing Modes for ATM Interfaces

	Framing Mode						
Interface Type	**SDH**	**SONET**	**DS3_CBIT**	**E3_G751**	**E3_G832**	**CBITnofallback**	**ClearChannel**
OC-3	✓	✓					
DS-3			✓			✓	✓
E-3				✓	✓		

Using the BCC

To change the framing mode, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

framing-mode *<mode>*

mode is one of the following framing modes:

- sdh
- sonet
- cbit
- g751
- g832
- cbitnofallback
- clearchannel

For example, the following command sets the framing mode to SDH:

```
atm/11/1# framing-mode sdh
atm/11/1#
```

Using Site Manager

To assign the framing mode to an ATM line, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **Framing Mode** parameter. Click on **Help** or see the parameter description on page A-8.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Defining the Clocking Signal Source

You can specify either an internal or external clocking source for time signals. Internal clocking uses the router clock; external clocking uses the line clock.

Using the BCC

To change the source of the ATM clocking signal, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

clock-signal-source *<source>*

source is either internal (default) or external.

For example, the following command changes the ATM clocking signal source to external:

```
atm/11/1# clock-signal-source external
atm/11/1#
```

Using Site Manager

To change the clocking signal source for the ATM line, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **Clocking Signal Source** parameter. Click on **Help** or see the parameter description on page A-8.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Specifying DS-3 Line Buildout

On modules that use a DS-3 interface, you can specify how the router conditions signals to migrate attenuation. Specify a short line (the default) for a line less than 225 feet (ft) long. Specify a long line for a line length of 225 ft or more.

Using the BCC

To change the DS-3 line buildout, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

ds3-line-build-out *<length>*

length is either short (default) or long.

For example, the following command changes the DS-3 line buildout to long:

```
atm/11/1# ds3-line-build-out long
atm/11/1#
```

Using Site Manager

To modify the DS-3 line buildout, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **DS3 Line Build Out** parameter. Click on **Help** or see the parameter description on page A-9.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Turning DS-3 and E-3 Scrambling On and Off

Some ATM network equipment can exhibit sensitivity to certain bit patterns (for example, 101010... or 000000...). This sensitivity can cause problems on the ATM network. Turning on the DS-3 and E-3 scrambling function (the default setting) randomizes the bit pattern in the cell payload sufficiently to guarantee cell synchronization.

Although some equipment can operate with scrambling disabled, Nortel Networks recommends that you scramble the cell payload.

Caution: ATM devices with different settings for scrambling cannot communicate. For example, if you configure a router to enable scrambling and configure a hub to disable scrambling, the router and hub cannot communicate.

Using the BCC

To turn off DS-3 and E-3 scrambling, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

scrambling off

For example, the following command turns off scrambling on the ATM connector:

```
atm/11/1# scrambling off
atm/11/1#
```

To turn scrambling back on, navigate to the atm prompt and enter:

scrambling on

For example, the following command turns the ATM connector scrambling back on:

```
atm/11/1# scrambling on
atm/11/1#
```

Using Site Manager

To turn DS-3 scrambling on or off, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **DS3 Scrambling** parameter. Click on **Help** or see the parameter description on page A-9.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Enabling and Disabling Per-VC Clipping

Per-VC clipping provides an added traffic-shaping option that allows you to modify how your ATM line responds to oversubscribed traffic. By default, per-VC clipping is disabled on a line. However, you can enable or disable per-VC clipping at any time.

When enabled, this option clips frames intended for an oversubscribed VC when the number of frames in memory exceeds a predetermined limit.

Note: Changing the state of this parameter tears down all active VCs on the interface. The new state takes effect after VC connections are reestablished.

Using the BCC

To enable per-VC clipping, navigate to the atm prompt (for example, **box; atm/11/1**) and enter:

clipping enabled

For example, the following command enables per-VC clipping on the ATM interface:

```
atm/11/1# clipping enabled
atm/11/1#
```

To disable per-VC clipping, navigate to the atm prompt and enter:

clipping disabled

For example, the following command disables per-VC clipping on the ATM interface:

```
atm/11/1# clipping disabled
atm/11/1#
```

Using Site Manager

To enable or disable per-VC clipping, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Line Attributes**.	The ATM/ARE Line Driver Attributes window opens.
3. Set the **Per-VC Clipping** parameter. Click on **Help** or see the parameter description on page A-10.	
4. Click on **OK**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling an ATM Interface

By default, the ATM interface is enabled when you create the circuit. However, you can disable or reenable the interface at any time.

When the interface is enabled, traffic can flow over the interface. When the interface is disabled, traffic cannot flow over the interface.

Using the BCC

To disable the ATM logical interface, navigate to the ATM interface prompt (for example, **box; atm/11/1; atm-interface/11/1**) and enter:

state disabled

For example, the following command disables the ATM interface:

```
atm-interface/11/1# state disabled
atm-interface/11/1#
```

To reenable the ATM interface, navigate to the ATM interface prompt and enter:

state enabled

For example, the following command reenables the ATM interface:

```
atm-interface/11/1# state enabled
atm-interface/11/1#
```

Using Site Manager

To disable or reenable the ATM interface, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Interface Attributes**.	The ATM Interface Attributes window opens.
3. Set the **Administrative State** parameter. Click on **Help** or see the parameter description on page A-11.	
4. Click on **Done**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling Signaling on an Interface

By enabling ATM signaling (the default setting), you can configure switched features (for example, SVCs and LAN emulation) on the interface. If you do not intend to configure any switched features on the interface (that is, you want the interface to run only PVCs), disabling ATM signaling makes additional system resources available.

To disable or reenable signaling on the ATM interface, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Interface Attributes**.	The ATM Interface Attributes window opens.
3. Set the **Enable ATM Signaling** parameter. Click on **Help** or see the parameter description on page A-11.	
4. Click on **Done**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Autogenerating ATM Addresses

You can automatically generate the user part (suffix) of SVC ATM addresses. When autogenerating this portion of the ATM addresses, you can use either the ATM hardware MAC address or a MAC address override value as the end-station identifier.

Enabling or Disabling the Hardware MAC Address Feature

If enabled, the hardware MAC address feature uses the MAC address of the ATM interface when automatically generating the ATM address user part. Disabling this feature uses the MAC address override value (see the next section) when automatically generating the ATM address user part.

➡ **Note:** If you disable the hardware MAC address feature, you must enter a MAC address override value.

Using the BCC

To disable the hardware MAC address feature, navigate to the ATM interface prompt (for example, **box; atm/11/1; atm-interface/11/1**) and enter:

use-hardware-mac disabled

For example, the following command disables the use of the hardware MAC address:

```
atm-interface/11/1# use-hardware-mac disabled
atm-interface/11/1#
```

To reenable the hardware MAC address feature, navigate to the ATM interface prompt and enter:

use-hardware-mac enabled

For example, the following command reenables the use of the hardware MAC address:

```
atm-interface/11/1# use-hardware-mac enabled
atm-interface/11/1#
```

Using Site Manager

To disable or reenable the use of the hardware MAC address, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on an ATM link module interface (**ATM1**).	The Select Connection Type window opens.
2. Click on **Interface Attributes**.	The ATM Interface Attributes window opens.
3. Set the **Use Hardware MAC Address** parameter. Click on **Help** or see the parameter description on page A-12.	
4. Click on **Done**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Entering a MAC Address Override Value

The MAC address override value redefines the hardware MAC address for the interface. It also defines the end-station identifier for the interface when automatically generating the user part (suffix) of an SVC ATM address.

Using a MAC address override value is very helpful when you want to hot-swap ATM link modules. For example, when hot-swapping ATM link modules, you can enter the MAC address of the original ATM link module as the MAC address override value for the new ATM link module. This allows you to keep the information already configured on the existing ATM link module while maintaining the integrity of the existing client information on the network.

Using the BCC

To change the MAC address override value, navigate to the ATM interface prompt (for example, **box; atm/11/1; atm-interface/11/1**) and enter:

mac-override *<mac_address>*

mac_address is the MAC address you want this interface to use.

For example, the following command changes the MAC address for the ATM interface:

```
atm-interface/11/1# mac-override 000011111aaa
atm-interface/11/1#
```

Using Site Manager

To change the MAC address that the ATM interface uses, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM link module interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **Interface Attributes**.	The ATM Interface Attributes window opens.
3. Set the **MAC Address Override** parameter. Click on **Help** or see the parameter description on page A-13.	
4. Click on **Done**.	You return to the Select Connection Type window.
5. Click on **Done**.	You return to the Configuration Manager window.

Defining the Maximum Number of VPCs

You can define the maximum number of virtual path connections (VPCs) that the ATM interface can have.

To change the maximum number of VPCs, navigate to the ATM interface prompt (for example, **box; atm/11/1; atm-interface/11/1**) and enter:

vpcs-maximum *<integer>*

integer is the maximum number of VPCs the ATM interface can use.

For example, the following command limits the number of VPCs to 128:

```
atm-interface/11/1# vpcs-maximum 128
atm-interface/11/1#
```

Defining the Maximum Number of VCCs

You can define the maximum number of virtual channel connections (VCCs) that each ATM virtual path can have.

To change the maximum number of VCCs, navigate to the ATM interface prompt (for example, **box; atm/11/1; atm-interface/11/1**) and enter:

vccs-maximum *<integer>*

integer is the maximum number of VCCs each virtual path can use.

For example, the following command limits the number of VCCs to 128:

```
atm-interface/11/1# vccs-maximum 128
atm-interface/11/1#
```

Where to Go Next

Use the following table to determine where to go next:

If you want to	**Go to**
Learn about ATM concepts.	Chapter 1
Start ATM .	Chapter 2
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 4
Customizing Signaling

When you start ATM on the router, all parameters use their default values. Depending on the requirements of your network, you may want to change some of these values. This chapter describes how to customize signaling details and includes the following information:

Defining Signaling

ATM signaling allows the router to dynamically establish, maintain, and clear a switched virtual connection at the UNI. Using a series of messages, as defined by the Q.2931 standard for signaling protocol (Figure 4-1), the router:

1. Assesses the availability of an ATM end point (device)
2. Establishes a connection with that device
3. Maintains that connection for the duration of the data transfer
4. Clears the connection when the transfer is complete

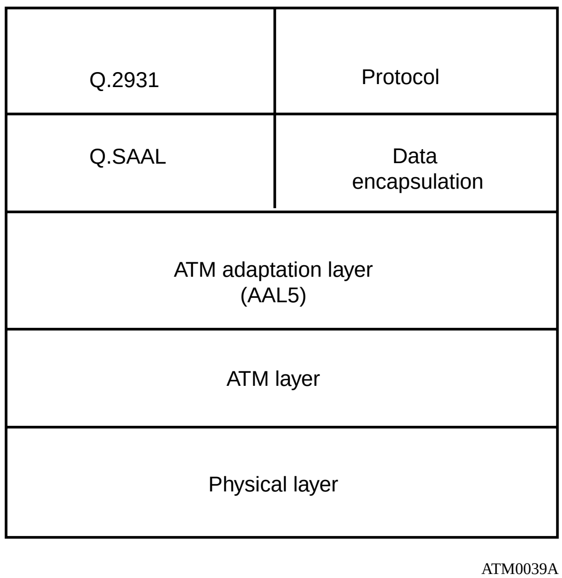


Figure 4-1. SVC/PVC Signaling Protocol Stack

Nortel Networks ATM routers support ATM signaling functions as defined in the ATM Forum *ATM User-Network Interface* specification (Versions 3.0, 3.1, and 4.0).

Disabling and Reenabling Signaling

By default, signaling is enabled on an interface when you create the signaling object (BCC) or when you create the circuit (Site Manager). However, you can disable and reenable signaling on an interface at any time.

Note: Disabling ATM signaling on an interface automatically sets the data encapsulation type to LLC/SNAP and the virtual connection type to PVC for any new service records.

Using the BCC

To disable signaling, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

state disabled

For example, the following command disables signaling on the ATM connector:

```
signaling/11/1# state disabled
signaling/11/1#
```

To reenable signaling, navigate to the signaling prompt and enter:

state enabled

For example, the following command reenables signaling on the ATM connector:

```
signaling/11/1# state enabled
signaling/11/1#
```

Using Site Manager

To disable or reenable signaling, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Enable** parameter. Click on **Help** or see the parameter description on page A-44.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Assigning the UNI Signaling Protocol Standard

The UNI signaling protocol standard specifies how the interface defines Service Specific Connection Oriented Protocol (SSCOP) frames. The ATM Forum Versions 3.0, 3.1, and 4.0 methods of defining SSCOP frames are incompatible.

You must assign the same protocol standard for both the router interface and the switch interface to which this interface connects.

Accept the default, ATM Forum UNI Version 3.0, if the switch interface uses ATM Forum UNI Version 3.0 to define SSCOP frames. Change the UNI signaling standard to UNI Version 3.1 or 4.0 if the switch interface uses ATM Forum UNI Version 3.1 or 4.0, respectively, to define SSCOP frames.

Using the BCC

To change the UNI version, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

uni-version *<version>*

version is the UNI signaling version, either v30 (default), v31, or v40.

For example, the following command changes the UNI signaling protocol standard to Version 3.1.

```
signaling/11/1# uni-version v31
signaling/11/1#
```

Using Site Manager

To change the UNI version, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Protocol Standard** parameter. Click on **Help** or see the parameter description on page A-45.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Specifying the Maximum Number of SVC Applications

You can specify the maximum number of SVC applications that you want to operate on the circuit. The number of applications corresponds to the number of LANE or IP (RFC 1577) clients allowed for the circuit.

By default, you can have up to 20 SVC applications on the circuit. However, you can specify a value from 1 to 32767.

Using the BCC

To change the maximum number of SVC applications, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

svc-applications-maximum *<integer>*

integer is a value from 1 to 32767.

For example, the following command sets the maximum number of SVC applications on the ATM circuit to 100.

```
signaling/11/1# svc-applications-maximum 100
signaling/11/1#
```

Using Site Manager

To modify the maximum number of SVC applications on the circuit, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Max Number of SVC Applications** parameter. Click on **Help** or see the parameter description on page A-45.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting Connection Thresholds

Connection thresholds allow you to control the number of point-to-point connections, point-to-multipoint connections, and parties in a multipoint connection allowed on the circuit at any given time.

Setting the Maximum Number of Point-to-Point Connections

By default, you can have up to 1000 simultaneous point-to-point connections on a circuit at any given time. However, you can specify a value from 0 to 32767 connections.

Using the BCC

To change the maximum number of point-to-point connections, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

point-to-point-maximum *<integer>*

integer is a value from 0 to 32767.

For example, the following command sets the maximum number of point-to-point connections on the ATM circuit to 2000:

```
signaling/11/1# point-to-point-maximum 2000
signaling/11/1#
```

Using Site Manager

To modify the maximum number of point-to-point connections on the circuit, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Max Point to Point Connections** parameter. Click on **Help** or see the parameter description on page A-46.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the Maximum Number of Point-to-Multipoint Connections

By default, you can have up to 40 simultaneous point-to-multipoint connections on a circuit at any given time. However, you can specify a value from 0 to 32767 connections.

Using the BCC

To change the maximum number of point-to-multipoint connections, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

point-to-multipoint-maximum *<integer>*

integer is a value from 0 to 32767.

For example, the following command sets the maximum number of point-to-multipoint connections on the ATM circuit to 100:

```
signaling/11/1# point-to-multipoint-maximum 100
signaling/11/1#
```

Using Site Manager

To modify the maximum number of point-to-multipoint connections on the circuit, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Max Point to Multipoint Connections** parameter. Click on **Help** or see the parameter description on page A-46.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the Maximum Number of Parties in Multipoint Connections

By default, you can have one party in each multipoint connection on a circuit at any given time. However, you can specify a value from 0 to 32767 parties.

Using the BCC

To change the maximum number of parties in multipoint connections, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

parties-multipoint-maximum *<integer>*

integer is a value from 0 to 32767.

For example, the following command sets the maximum number of parties in multipoint connections to 2:

```
signaling/11/1# parties-multipoint-maximum 2
signaling/11/1#
```

Using Site Manager

To modify the maximum number of parties allowed in multipoint connections, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Max Parties in Multipoint Connections** parameter. Click on **Help** or see the parameter description on page A-47.	
5. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the Minimum Memory Threshold

The minimum memory threshold defines the minimum percentage of buffer memory required to enable a new call. The default value is 20 percent, but you can specify a percentage from 10 to 100 percent in increments of 10 (for example, 10 percent, 30 percent, and so on).

Using the BCC

To change the minimum memory threshold, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

minimum-memory-threshold *<value>*

value is a percentage from 10 to 100 (in increments of 10).

For example, the following command sets the minimum memory threshold value to 30 percent:

```
signaling/11/1# minimum-memory-threshold 30
signaling/11/1#
```

Using Site Manager

To change the minimum memory threshold, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Min Memory Threshold** parameter. Click on **Help** or see the parameter description on page A-47.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Defining Signaling Timer Resolution

The signaling timer resolution specifies how much time has elapsed (in tenths of a second) between successive timer events.

Using the BCC

To change the signaling timer resolution, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

signaling-timer-resolution *<value>*

value is the amount of time (in tenths of a second) that you want the signaling timer resolution to use.

For example, the following command sets the signaling timer resolution to 2048:

```
signaling/11/1# signaling-timer-resolution 2048
signaling/11/1#
```

Defining Signaling Timers

Caution: Nortel Networks strongly recommends that you use default timer values. These values work properly under most ATM network conditions. However, if you do change any of the timer values, you must also change the values at the other end of the UNI (that is, at the local ATM switch).

You can change the default values for signaling timers. Table 4-1 provides the BCC name, Site Manager name, default value, range, and description for each timer.

Table 4-1. Signaling Timer Descriptions

BCC Name	Site Manager Name	Default Value	Range	Description
alert-rx-timer	T301	180	180 to 1024	Specifies the Alert Received timer value (in seconds). This timer begins when the circuit initiates a call/connection request by receiving an ALERT message over the signaling VC. The Alert Received timer stops when the circuit receives a CONNECT message (indicating connection) from the network. If the circuit does not receive a CONNECT message within the allotted time, it clears the connection. This timer can be used with UNI Version 4.0 and later.

(continued)

Table 4-1. Signaling Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
setup-tx-timer	T303	4	1 to 24	Specifies the Setup Sent timer value (in seconds). This timer begins when the circuit initiates a call/ connection request by sending a SETUP message over the signaling VC. The Setup Sent timer stops when the circuit receives a CONNECT message (indicating connection), a CALL PROCEEDING message (indicating that the network received the SETUP message), or a RELEASE COMPLETE message (indicating the rejection of the SETUP message) from the network. If the circuit does not receive one of these messages within the allotted time, it transmits the SETUP message again. If the circuit still does not receive a response, it clears the connection.
setup-ack-rx-timer	T304	30	30 to 120	Specifies the Setup Acknowledgement timer value (in seconds). This timer begins when the circuit receives a SETUP ACK message after initiating a call/connection request, and restarts when the circuit sends an INFO message over the signaling VC. . The Setup Acknowledgement timer stops when the circuit receives a CONNECT message (indicating connection), a CALL PROCEEDING message (indicating that the network received the SETUP message), or an ALERT from the network. If the circuit does not receive one of these messages within the allotted time, it clears the connection. This timer can be used with UNI Version 4.0 and later.

(continued)

Table 4-1. Signaling Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
release-tx-timer	T308	30	1 to 180	Specifies the Release Sent timer value (in seconds). This timer begins when the circuit sends a RELEASE message to initiate clearing of an SVC. Sending a RELEASE message places the network in the Release Request state. The Release Sent timer stops when the circuit receives from the network either a RELEASE message (that is, both the circuit and the network sent RELEASE messages at the same time) or a RELEASE COMPLETE message. If the timer expires before the circuit receives one of these messages, the circuit transmits the RELEASE message again. If the circuit still does not receive a response, the circuit releases the call reference and begins a restart procedure.
datalink-connect-timer	T309	10	1 to 540	Specifies the SAAL Data Link Connect timer value (in seconds). This timer begins when a signaling AAL malfunction occurs. The SAAL Data Link Connect timer stops when the circuit reestablishes SAAL (that is, when the circuit sends an AAL-ESTABLISH-REQUEST and receives an AAL-ESTABLISH-CONFIRM message). If the timer expires before the circuit can reestablish SAAL, the circuit clears the connection.
call-proceeding-rx-timer	T310	10	1 to 60	Specifies the Call Proceeding Received timer value (in seconds). This timer begins when the circuit receives a CALL PROCEEDING message from the network. If the signaling VC does not receive a CONNECT or RELEASE message before this timer expires, it clears the connection for that virtual circuit.

(continued)

Table 4-1. Signaling Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
connect-tx-timer	T313	4	1 to 24	Specifies the Connect Sent timer value (in seconds). This timer begins when the circuit sends a CONNECT message to the network. The Connect Sent timer stops when the circuit receives a CONNECT ACKNOWLEDGE message from the network (indicating the completion of the ATM connection for that interface). If the timer expires before the circuit receives a CONNECT ACKNOWLEDGE message, the circuit clears the connection.
restart-request-tx-interface-timer	T316	120	1 to 720	Specifies the Restart Request Sent on Interface timer value (in seconds). This timer begins when the circuit sends a RESTART message to the network. The circuit uses the RESTART message to return all VCs on the interface to the idle condition. The Restart Request Sent on Interface timer stops when the circuit receives a RESTART ACKNOWLEDGE message from the network. If the timer expires before the circuit receives a RESTART ACKNOWLEDGE message, the circuit can retransmit the RESTART message (see "Setting the Number of Allowable Restart Messages" on page 4-25). If the circuit still does not receive a response, the circuit enters the null state until the appropriate maintenance action is taken.

(continued)

Table 4-1. Signaling Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
restart-request-tx-channel-timer	T316c	120	1 to 720	Specifies the Restart Request Sent on Channel timer value (in seconds). This timer begins when the circuit sends a RESTART message to the network. The circuit uses the RESTART message to return this individual VC on the interface to the idle condition. The Restart Request Sent on Channel timer stops when the circuit receives a RESTART ACKNOWLEDGE message from the network. If the timer expires before the circuit receives a RESTART ACKNOWLEDGE message, the circuit can retransmit the RESTART message (see "Setting the Number of Allowable Restart Messages" on page 4-25). If the circuit still does not receive a response, the circuit enters the null state until the appropriate maintenance action is taken.
status-enquiry-tx-timer	T322	4	1 to 24	Specifies the Status Enquiry Sent timer value (in seconds). This timer begins when the circuit sends a STATUS ENQUIRY message to the network. This message checks the validity of a call by requesting the call state (that is, active, in progress, or null). The Status Enquiry Sent timer stops when the circuit receives a STATUS message from the network. If the timer expires before the circuit receives a STATUS message, the circuit can retransmit the STATUS ENQUIRY message (see "Setting the Number of Allowable Status Enquiries" on page 4-26). If the circuit still does not receive a response, the circuit clears the call.

(continued)

Table 4-1. Signaling Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
disconnect-timer	TDisc	4	1 to 180	Specifies the SAAL Data Link Disconnect timer value (in seconds). This internal timer alerts upper layers that the link is down. The timer begins if the entire link goes down for any reason. When the link goes down, the SAAL sends a DISCONNECT REQUEST message to the upper-layer application manager. The SAAL sends a disconnect request every time the SAAL Data Link Disconnect timer expires and continues to send this message until the link becomes operational.
alerting-rx-timer	T397	180	180 to 1024	Specifies the Alerting Received timer value (in seconds). This timer begins when the circuit receives an ALERTING or ADD PARTY ALERTING message over the signaling VC. The Alerting Received timer stops when the circuit receives an ADD PARTY ACKNOWLEDGE message. The first time that the timer expires, the circuit sends a DROP PART or RELEASE message. When the timer expires a second time, the timer will not restart. This timer can be used with UNI Version 4.0 and later.

(continued)

Table 4-1. Signaling Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
drop-party-tx-timer	T398	4	1 to 24	Specifies the Drop Party Sent timer value (in seconds). This timer applies to multipoint connections only and begins when the circuit sends a DROP PARTY message to a party (the receiver of the message) on the network. The Drop Party Sent timer stops when the circuit receives a DROP PARTY ACKNOWLEDGE message (indicating that the end point used for the party has been released) or a RELEASE message (indicating that the end point used for the party has been released and there are no remaining parties). The first time that the timer expires, the circuit sends a DROP PARTY ACKNOWLEDGE or a RELEASE message. When the timer expires a second time, it will not restart.
add-party-tx-timer	T399	14	1 to 84	Specifies the Add Party Sent timer value (in seconds). This timer applies to multipoint connections only and begins when the circuit sends an ADD PARTY message to a party (the receiver of the message) on the network. The Add Party Sent timer stops when the circuit receives an ADD PARTY ACKNOWLEDGE message (indicating the connection to the party), an ADD PARTY REJECT message (indicating the inability to add the party), or a RELEASE message (indicating the inability to add the party and the absence of any remaining parties). The first time that the timer expires, the circuit sends a DROP PARTY or a RELEASE message. When the timer expires a second time, it will not restart. If the timer expires before the circuit receives an ADD PARTY ACKNOWLEDGE, ADD PARTY REJECT, or RELEASE message, the circuit clears the party.

Using the BCC

To change a timer value, navigate to the signaling timers prompt (for example, **box; atm/11/1; signaling/11/1; timers/11/1**) and enter:

<timer_name> <integer>

timer_name is the BCC name for the timer (see Table 4-1 for the names and descriptions of signaling timers).

integer is the time value (in seconds) that you want the timer to use.

For example, the following command changes the disconnect timer to 8 seconds:

```
timers/11/1# disconnect-timer 8
timers/11/1#
```

Using Site Manager

To change a signaling timer value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
4. Set one or more of the following timers: • **T301** • **T303** • **T304** • **T308** • **T309** • **T310** • **T313** • **T316** • **T316c** • **T322** • **TDisc** • **T397** • **T398** • **T399** Click on **Help** or see the parameter descriptions beginning on page A-50.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Defining Retransmissions

The ATM circuit can retransmit a specified number of RESTART and STATUS ENQUIRY messages before it considers the link down. You can control how many of these messages the circuit retransmits.

Setting the Number of Allowable Restart Messages

By default, the circuit can retransmit three RESTART messages before it considers the link down. However, you can set the number of RESTART messages that the circuit can send to a value from 1 to 100.

Using the BCC

To change the number of times the ATM circuit can retransmit RESTART messages, navigate to the signaling timer prompt (for example, **box; atm/11/1; signaling/11/1; timers/11/1**) and enter:

restarts-retransmitted *<integer>*

integer is the number of times a circuit can retransmit RESTART messages.

For example, the following command changes the number of times to 8:

```
timers/11/1# restarts-retransmitted 8
timers/11/1#
```

Using Site Manager

To change the number of times the circuit can retransmit RESTART messages, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
4. Set the **Num Restarts ReXmitted** parameter. Click on **Help** or see the parameter description on page A-62.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the Number of Allowable Status Enquiries

By default, the circuit can retransmit three STATUS ENQUIRY messages before it considers the link down. However, you can set the number of STATUS ENQUIRY messages that the circuit can send to a value from 1 to 100.

Using the BCC

To change the number of times the ATM circuit can retransmit STATUS ENQUIRY messages, navigate to the signaling timer prompt (for example, **box; atm/11/1; signaling/11/1; timers/11/1**) and enter:

status-enquiries *<integer>*

integer is the number of times a circuit can retransmit STATUS ENQUIRY messages.

For example, the following command changes the number of times to 8:

```
timers/11/1# status-enquiries 8
timers/11/1#
```

Using Site Manager

To change the number of times the circuit can retransmit STATUS ENQUIRY messages, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Num Stat Enquiries ReXmitted** parameter. Click on **Help** or see the parameter description on page A-63.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling Restarts

By default, signaling sends restart messages automatically when a link comes up from being in a down state. However, you can specify whether or not you want signaling to send these restarts messages.

To disable automatic restart messages, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

send-restart disabled

For example, the following command disables restart messages on the ATM connector:

```
signaling/11/1# send-restart disabled
signaling/11/1#
```

To reenable automatic restart messages, navigate to the signaling prompt and enter:

send-restart enabled

For example, the following command reenables restart messages on the ATM connector:

```
signaling/11/1# send-restart enabled
signaling/11/1#
```

Pacing Calls

You can define how the circuit paces its calls. By default, this feature is set to 0 (off); the circuit transmits call setups at line rate. However, you can set this value from 0 to 2,147,483,647 calls per second.

To change how the circuit paces its calls, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Set the **Num Messages/Sec for Call Pacing** parameter. Click on **Help** or see the parameter description on page A-63.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Defining ILMI

In a switched ATM network, an ATM device must register its ATM address with an ATM switch. The router uses the Interim Local Management Interface (ILMI) to send and receive initial registration data to and from an ATM switch. Using a series of ILMI SNMP **set** and **get** commands, the router:

1. Initializes its ATM address table for the interface (the switch also initializes its address table for the interface)
2. Receives the ATM address network prefix from the switch
3. Combines this network prefix with its own user part (suffix)
4. Transmits the entire address to the switch

Disabling and Reenabling ILMI

By default, ILMI is enabled on an interface when you enable signaling. However, you can disable and reenable ILMI on an interface at any time.

Using the BCC

To disable ILMI, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

ilmi disabled

For example, the following command disables ILMI on the ATM connector:

```
ilmi/11/1# ilmi disabled
ilmi/11/1#
```

To reenable ILMI, navigate to the ILMI prompt and enter:

ilmi enabled

For example, the following command reenables ILMI on the ATM connector:

```
ilmi/11/1# ilmi enabled
ilmi/11/1#
```

Using Site Manager

To disable or reenable ILMI on an interface, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Set the **Enable** parameter. Click on **Help** or see the parameter description on page A-64.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Modifying ILMI Timers and Retry Counters

You can modify the following timers and their associated counters for ILMI:

- ILMI Get Request timer and retry count
- ILMI Get Next Request timer and retry count
- ILMI Set Request timer and retry count

Setting the ILMI Get Request Timer

The ILMI Get Request timer specifies the amount of time allowed for the circuit to receive a GET_RESPONSE message after sending a GET_REQUEST message. By default, the circuit waits 3 seconds for a response. However, you can set this timer to a value from 1 to 120 seconds.

Using the BCC

To change the ILMI Get Request timer value, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

get-timer *<integer>*

integer is the time value (in seconds) that you want the timer to use.

For example, the following command changes the ILMI Get Request timer to 6 seconds:

```
ilmi/11/1# get-timer 6
ilmi/11/1#
```

Using Site Manager

To change the ILMI Get Request timer value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Set the **ILMI Get Timer** parameter. Click on **Help** or see the parameter description on page A-65.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the ILMI Get Request Retry Count

The ILMI Get Request retry count specifies the number of times the circuit can retransmit the ILMI GET_REQUEST message before it considers the link down. By default, the circuit can retransmit three ILMI GET_REQUEST messages. However, you can set the number of retries to a value from 1 to 100.

Using the BCC

To change the ILMI Get Request retry count value, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

get-retry-count *<integer>*

integer is the count value that you want the timer to use.

For example, the following command changes the ILMI Get Request retry count to 6:

```
ilmi/11/1# get-retry-count 6
ilmi/11/1#
```

Using Site Manager

To change the ILMI Get Request retry count value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Set the **ILMI Get Retry Count** parameter. Click on **Help** or see the parameter description on page A-66.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the ILMI Get Next Request Timer

The ILMI Get Next Request timer specifies the amount of time allowed for the circuit to receive a GET_NEXT_RESPONSE message after sending a GET_NEXT_REQUEST message. By default, the circuit waits 3 seconds for a response. However, you can set this timer to a value from 1 to 120 seconds.

Using the BCC

To change the ILMI Get Next Request timer value, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

get-next-timer *<integer>*

integer is the time value (in seconds) that you want the timer to use.

For example, the following command changes the ILMI Get Next Request timer to 6 seconds:

```
ilmi/11/1# get-next-timer 6
ilmi/11/1#
```

Using Site Manager

To change the ILMI Get Next Request timer value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Set the **ILMI Get Next Timer** parameter. Click on **Help** or see the parameter description on page A-66.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the ILMI Get Next Request Retry Count

The ILMI Get Next Request retry count specifies the number of times the circuit can retransmit the ILMI GET_NEXT_REQUEST message before it considers the link down. By default, the circuit can retransmit three ILMI GET_NEXT_REQUEST messages. However, you can set the number of retries to a value from 1 to 100.

Using the BCC

To change the ILMI Get Next Request retry count value, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

get-next-retry-count *<integer>*

integer is the count value that you want the timer to use.

For example, the following command changes the ILMI Get Next Request retry count to 6:

```
ilmi/11/1# get-next-retry-count 6
ilmi/11/1#
```

Using Site Manager

To change the ILMI Get Next Request retry count value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Set the **ILMI Get Next Retry Count** parameter. Click on **Help** or see the parameter description on page A-66.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the ILMI Set Request Timer

The ILMI Set Request timer specifies the amount of time allowed for the circuit to receive a SET_RESPONSE message after sending a SET_REQUEST message. By default, the circuit waits 3 seconds for a response. However, you can set this timer to a value from 1 to 120 seconds.

Using the BCC

To change the ILMI Set Request timer value, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

set-timer *<integer>*

integer is the time value (in seconds) that you want the timer to use.

For example, the following command changes the ILMI Set Request timer to 6 seconds:

```
ilmi/11/1# set-timer 6
ilmi/11/1#
```

Using Site Manager

To change the ILMI Set Request timer value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Set the **ILMI Set Timer** parameter. Click on **Help** or see the parameter description on page A-67.	
5. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the ILMI Set Request Retry Count

The ILMI Set Request retry count specifies the number of times the circuit can retransmit the ILMI SET_REQUEST message before it considers the link down. By default, the circuit can retransmit three ILMI SET_REQUEST messages. However, you can set the number of retries to a value from 1 to 100.

Using the BCC

To change the ILMI Set Request retry count value, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

set-retry-count *<integer>*

integer is the count value that you want the timer to use.

For example, the following command changes the ILMI Set Request retry count value to 6:

```
ilmi/11/1# set-retry-count 6
ilmi/11/1#
```

Using Site Manager

To change the ILMI Set Request retry count value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM Signaling Parameters window opens.
4. Set the **ILMI Set Retry Count** parameter. Click on **Help** or see the parameter description on page A-67.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Defining Control VCs

Control VCs are dedicated VPI/VCI pairs reserved for signaling and ILMI messages. These VCs remain in an operational state as long as signaling is enabled on the ATM interface.

Having dedicated PVCs defined for signaling and ILMI allows the ATM router to send and receive initial registration data to and from an ATM switch.

Caution: Because most ATM devices use standard VPI/VCI pairs for signaling, Nortel Networks recommends that you not change the control VC values. However, you can redefine the signaling and ILMI control VCs for your specific network.

Changing VPI Numbers

By default, the VPI for both the signaling and ILMI control VC is 0. However, you can change the VPI number to any value from 0 to 255.

Using the BCC

To change the signaling VPI number, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

vpi *<integer>*

integer is the VPI number that you want the signaling VC to use.

For example, the following command changes the signaling VPI number to 8:

```
signaling/11/1# vpi 8
signaling/11/1#
```

To change the ILMI VPI number, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

vpi *<integer>*

integer is the VPI number that you want the ILMI VC to use.

For example, the following command changes the ILMI VPI number to 8:

```
ilmi/11/1# vpi 8
ilmi/11/1#
```

Using Site Manager

To change the signaling VPI number, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **VPI** parameter. Click on **Help** or see the parameter description on page A-48.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the ILMI VPI number, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **ILMI VPI** parameter. Click on **Help** or see the parameter description on page A-64.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Changing VCI Numbers

By default, the VCI for the signaling control VC is 5 and the VCI for the ILMI control VC is 16. However, you can change the VCI number to any value from 1 to 65535.

Using the BCC

To change the signaling VCI number, navigate to the signaling prompt (for example, **box; atm/11/1; signaling/11/1**) and enter:

vci *<integer>*

integer is the VCI number that you want the signaling VC to use.

For example, the following command changes the signaling VCI number to 32:

signaling/11/1# **vci 32**
signaling/11/1#

To change the ILMI VCI number, navigate to the ILMI prompt (for example, **box; atm/11/1; signaling/11/1; ilmi/11/1**) and enter:

vci *<integer>*

integer is the VCI number that you want the ILMI VC to use.

For example, the following command changes the ILMI VCI number to 32:

ilmi/11/1# **vci 32**
ilmi/11/1#

Using Site Manager

To change the signaling VCI number, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **VCI** parameter. Click on **Help** or see the parameter description on page A-49.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the ILMI VCI number, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **ILMI VCI** parameter. Click on **Help** or see the parameter description on page A-65.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Modifying Control VC Traffic Parameters

You can modify the following traffic parameters for both the signaling and the ILMI control VCs:

- Peak cell rate (PCR)
- Sustainable cell rate (SCR)
- Maximum burst size (MBS)

For additional information about traffic parameters, see "ATM Traffic Parameters" on page 1-23.

Setting the PCR

The peak cell rate (PCR) specifies the upper traffic limit, in cells/s, that the ATM connection can support.

By default, the PCR is set to 4716 cells/s. Table 4-2 lists the valid ranges for each Nortel Networks ATM router.

Table 4-2. Valid PCR Ranges

ATM Router	Range (Cells/s)
ATM ARE OC-3 SONET/SDH ILI pairs	128 to 353,207
Model 5782 Centillion MPE	128 to 353,207
ATM ARE DS-3 ILI pairs	128 to 96,000
ATM ARE E-3 ILI pairs; G.832 framing mode	128 to 80,000
ATM ARE E-3 ILI pairs; G.751 framing mode	128 to 72,000

For additional information about the PCR, see "Using the PCR" on page 1-24.

Using the BCC

To change the PCR value for the signaling VC, navigate to the signaling VC prompt (for example, **box; atm/11/1; signaling/11/1; signaling-vc/11/1/0/5**) and enter:

pcr *<integer>*

integer is the PCR value that you want the signaling VC to use.

For example, the following command changes the PCR value to 8000:

```
signaling-vc/11/1/0/5# pcr 8000
signaling-vc/11/1/0/5#
```

To change the PCR value for the ILMI VC, navigate to the ILMI VC prompt (for example, **box; atm/11/1; signaling/11/1; ilmi-vc/11/1/0/16**) and enter:

pcr *<integer>*

integer is the PCR value that you want the ILMI VC to use.

For example, the following command changes the ILMI VC PCR value to 8000:

```
ilmi-vc/11/1/0/16# pcr 8000
ilmi-vc/11/1/0/16#
```

Using Site Manager

To change the signaling PCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **Xmit Peak Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter description on page A-68.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the ILMI PCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **Xmit Peak Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter description on page A-68.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Setting the SCR

The sustainable cell rate (SCR) is the upper bound on the conforming average rate of an individual PVC or control VC. The *average rate* is the number of cells transmitted over the link divided by the duration of the connection. The *duration of the connection* is the total amount of time it takes from connection setup to connection release.

By default, the SCR is set to 4716 cells/s. Table 4-3 lists the valid ranges for each Nortel Networks ATM router. To disable the SCR, set the value to 0.

Table 4-3. Valid SCR Ranges

ATM Router	Range (Cells/s)
ATM ARE OC-3 SONET/SDH ILI pairs	0, 128 to 353,207
Model 5782	0, 128 to 353,207
ATM ARE DS-3 ILI pairs	0, 128 to 96,000
ATM ARE E-3 ILI pairs; G.832 framing mode	0, 128 to 80,000
ATM ARE E-3 ILI pairs; G.751 framing mode	0, 128 to 72,000

For additional information about the SCR, see "Using the SCR" on page 1-25.

Using the BCC

To change the SCR value for signaling VCs, navigate to the signaling VC prompt (for example, **box; atm/11/1; signaling/11/1; signaling-vc/11/1/0/5**) and enter:

scr *<integer>*

integer is the SCR value that you want the signaling VC to use.

For example, the following command changes the signaling VC SCR value to 8000:

```
signaling-vc/11/1/0/5# scr 8000
signaling-vc/11/1/0/5#
```

To change the ILMI SCR value, navigate to the ILMI VC prompt (for example, **box; atm/11/1; signaling/11/1; ilmi-vc/11/1/0/16**) and enter:

scr *<integer>*

integer is the SCR value that you want the ILMI VC to use.

For example, the following command changes the ILMI VC SCR value to 8000:

```
ilmi-vc/11/1/0/16# scr 8000
ilmi-vc/11/1/0/16#
```

Using Site Manager

To change the signaling SCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **Xmit Sustainable Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter description on page A-69.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the ILMI SCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **Xmit Sustainable Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter description on page A-69.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Setting the MBS

The maximum burst size (MBS) specifies the maximum number of sequential cells allowed on a VC before that VC must relinquish bandwidth to other VCs waiting to transmit. This burst occurs at or close to the peak cell rate.

When setting the MBS, you should select a value larger than the largest packet your control VC can transmit (that is, the size of the maximum AAL CPCS transmit SDU). For example, if your VC accepts packets that are less than 4608 bytes long (PVC default), set your MBS value between 45 and 50 cells.

By default, the MBS is set to 40 cells. However, you can set the MBS to any value from 1 to 65535 cells.

For additional information about the MBS, see "Using the MBS" on page 1-26. For information about setting the maximum AAL CPCS transmit SDU size, see "Modifying the Maximum AAL CPCS SDU Size" on page 4-55.

Using the BCC

To change the MBS value for signaling VCs, navigate to the signaling VC prompt (for example, **box; atm/11/1; signaling/11/1; signaling-vc/11/1/0/5**) and enter:

tx-burst-size *<integer>*

integer is the MBS value that you want the signaling VC to use.

For example, the following command changes the MBS value to 80 cells:

```
signaling-vc/11/1/0/5# tx-burst-size 80
signaling-vc/11/1/0/5#
```

To change the MBS value for ILMI VCs, navigate to the ILMI VC prompt (for example, **box; atm/11/1; signaling/11/1; ilmi-vc/11/1/0/16**) and enter:

tx-burst-size *<integer>*

integer is the MBS value that you want the ILMI VC to use.

For example, the following command changes the MBS value to 80 cells:

```
ilmi-vc/11/1/0/16# tx-burst-size 80
ilmi-vc/11/1/0/16#
```

Using Site Manager

To change the signaling control VC MBS value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **Xmit Burst Size (cells)** parameter. Click on **Help** or see the parameter description on page A-70.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the ILMI control VC MBS value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **Xmit Burst Size (cells)** parameter. Click on **Help** or see the parameter description on page A-70.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Modifying the Maximum AAL CPCS SDU Size

The maximum AAL CPCS SDU value defines the maximum packet size you intend the control VC to transmit or receive.

Setting the Transmit SDU Size

Nortel Networks suggests that you accept the default value of 4608 bytes for the maximum AAL CPCS SDU size that the control VC supports in the transmit direction. Most packet sizes fall well within this limit. However, you can set the transmit SDU size to any value from 1 to 65,535 bytes.

Using the BCC

To change the transmit SDU size for the signaling control VC, navigate to the signaling VC prompt (for example, **box; atm/11/1; signaling/11/1; signaling-vc/11/1/0/5**) and enter:

tx-sdu-maximum *<integer>*

integer is the maximum SDU size that you want the signaling VC to transmit.

For example, the following command changes the maximum transmit SDU size to 65,535 bytes:

```
signaling-vc/11/1/0/5# tx-sdu-maximum 65535
signaling-vc/11/1/0/5#
```

To change the transmit SDU size for the ILMI control VC, navigate to the ILMI VC prompt (for example, **box; atm/11/1; signaling/11/1; ilmi-vc/11/1/0/16**) and enter:

tx-sdu-maximum *<integer>*

integer is the maximum SDU size that you want the ILMI VC to transmit.

For example, the following command changes the maximum transmit SDU size to 65,535 bytes:

```
ilmi-vc/11/1/0/16# tx-sdu-maximum 65535
ilmi-vc/11/1/0/16#
```

Using Site Manager

To change the maximum transmit SDU size for the signaling control VC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **Maximum AAL CPCS Transmit SDU Size** parameter. Click on **Help** or see the parameter description on page A-71.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select ConnectionType window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the maximum transmit SDU size for the ILMI control VC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **Maximum AAL CPCS Transmit SDU Size** parameter. Click on **Help** or see the parameter description on page A-71.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Setting the Receive SDU Size

Nortel Networks suggests that you accept the default value of 4608 bytes for the maximum AAL CPCS SDU size that the control VC supports in the receive direction. Most packet sizes fall well within this limit. However, you can set the receive SDU size to any value from 1 to 65,535 bytes.

Using the BCC

To change the receive SDU size for the signaling control VC, navigate to the signaling VC prompt (for example, **box; atm/11/1; signaling/11/1; signaling-vc/11/1/0/5**) and enter:

rx-sdu-maximum *<integer>*

integer is the maximum SDU size that you want the signaling VC to receive.

For example, the following command changes the maximum receive SDU size to 65,535 bytes:

```
signaling-vc/11/1/0/5# rx-sdu-maximum 65535
signaling-vc/11/1/0/5#
```

To change the receive SDU size for the ILMI control VC, navigate to the ILMI VC prompt (for example, **box; atm/11/1; signaling/11/1; ilmi-vc/11/1/0/16**) and enter:

rx-sdu-maximum *<integer>*

integer is the maximum SDU size that you want the ILMI VC to receive.

For example, the following command changes the maximum receive SDU size to 65,535 bytes:

```
ilmi-vc/11/1/0/16# rx-sdu-maximum 65535
ilmi-vc/11/1/0/16#
```

Using Site Manager

To change the maximum receive SDU size for the signaling control VC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **ATM Signaling**.	The ATM Signaling Parameters window opens.
4. Click on **Sig VC**.	The ATM Control VC for Signaling window opens.
5. Set the **Maximum AAL CPCS Receive SDU Size** parameter. Click on **Help** or see the parameter description on page A-71.	
6. Click on **Done**.	You return to the ATM Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

To change the maximum receive SDU size for the ILMI control VC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Interim Local Management Interface (ILMI)**.	The ATM ILMI Signaling Parameters window opens.
4. Click on **ILMI VC**.	The ATM Control VC for ILMI window opens.
5. Set the **Maximum AAL CPCS Receive SDU Size** parameter. Click on **Help** or see the parameter description on page A-71.	
6. Click on **Done**.	You return to the ATM ILMI Signaling Parameters window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Defining SSCOP/Signaling AAL

As defined by the ATM Forum, the SSCOP (or Q.SAAL) resides between the ATM adaptation layer and the Q.2931 signaling layer. SSCOP/SAAL reliably transports signaling messages between peer Q.2931 entities over the ATM adaptation layer (Figure 4-2).

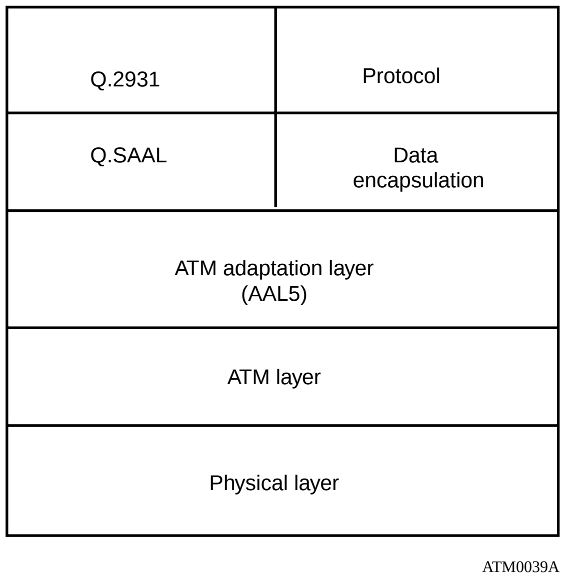


Figure 4-2. SVC/PVC Signaling Protocol Stack

Nortel Networks routers support SSCOP/SAAL functions as defined in the ATM Forum *ATM User-Network Interface* specification (Versions 3.0 and 3.1).

Disabling and Reenabling SSCOP/SAAL

By default, SSCOP/SAAL is enabled on an interface when you create the circuit. However, you can disable or reenable this signaling on an interface at any time.

Using the BCC

To disable SSCOP on the interface, navigate to the SSCOP prompt (for example, **box; atm/11/1; signaling/11/1; sscop/11/1**) and enter:

state disabled

For example, the following command disables SSCOP on the ATM interface:

```
sscop/11/1# state disabled
sscop/11/1#
```

To reenable SSCOP, navigate to the SSCOP prompt and enter:

state enabled

For example, the following command reenables SSCOP on the ATM interface:

```
sscop/11/1# state enabled
sscop/11/1#
```

Using Site Manager

To disable or reenable SSCOP, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Signaling AAL (SAAL)**.	The ATM Signaling AAL Records List window opens.
4. Set the **Enable** parameter. Click on **Help** or see the parameter description on page A-72.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Defining the Link Connection Arbitration

Link connection arbitration defines whether SSCOP/SAAL initiates link connections (active, the default value) or waits for connections (passive).

Using the BCC

To make link connection arbitration passive, navigate to the SSCOP prompt (for example, **box; atm/11/1; signaling/11/1; sscop/11/1**) and enter:

link-connect-arbitration passive

For example, the following command specifies that SSCOP waits for connections:

```
sscop/11/1# link-connect-arbitration passive
sscop/11/1#
```

To change link connection arbitration to active, navigate to the SSCOP prompt and enter:

link-connect-arbitration active

For example, the following command specifies that SSCOP initiates connections:

```
sscop/11/1# link-connect-arbitration active
sscop/11/1#
```

Using Site Manager

To set the SSCOP link arbitration state, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Signaling AAL (SAAL)**.	The ATM Signaling AAL Records List window opens.
4. Set the **Link Connection Arbitration** parameter. Click on **Help** or see the parameter description on page A-72.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Modifying SAAL Timers

Note: Nortel Networks recommends that you leave these timers set to their default values unless instructed to change them by Nortel Networks Customer Service or your switch provider.

You can change the default values for SSCOP/SAAL timers. For each timer, Table 4-4 provides the BCC name, Site Manager name, default value, range, and description.

Table 4-4. SSCOP/SAAL Timer Descriptions

BCC Name	Site Manager Name	Default Value	Range	Description
poll-timer	Poll Timer	7	1 to 120	Specifies the SSCOP poll timer value (in tenths of a second). This value sets the allowable time between POLL PDU transmissions. The poll timer ensures that the receiver continues to return a solicited status (STAT) PDU to the sender on a regular basis. The timely receipt of STAT PDUs restarts the poll timer and allows for more efficient transmission error recovery.
keep-alive-timer	Keep Alive Timer	20	1 to 120	Specifies the SSCOP keep alive timer value (in tenths of a second). This value sets the allowable time between POLL PDU transmissions if there are no pending sequence data (SD) PDUs. The keep alive timer is generally greater than the poll timer and greater than the length of one round-trip delay.

(continued)

Table 4-4. SSCOP/SAAL Timer Descriptions *(continued)*

BCC Name	Site Manager Name	Default Value	Range	Description
no-response-timer	No Response Timer	70	1 to 120	Specifies the SSCOP no response timer value (in tenths of a second). This value sets the allowable time between the receipt of STAT PDUs. So as not to interrupt the flow of data, SSCOP does not require a reply to every POLL PDU. This can cause problems in detecting a failed connection. To alleviate this problem, the no response timer runs parallel to the poll timer. If both the no response timer and the poll timer expire, SSCOP clears the connection. The no response timer value must equal at least the sum of the keep alive timer plus the length of one round-trip delay.
connection-control-timer	Connection Control Timer	10	1 to 120	Specifies the SSCOP connection control (CC) timer value (in tenths of a second). This value sets the allowable time between the transmission of begin (BGN), END, resynchronization (RS), and error recovery (ER) PDUs, as long as the sender has not received an acknowledgment to any of these PDUs. The CC timer must equal at least the length of one round-trip delay.

Using the BCC

To change an SSCOP timer value, navigate to the SSCOP prompt (for example, **box; atm/11/1; signaling/11/1; sscop/11/1**) and enter:

<timer_name> <integer>

timer_name is the BCC name for the timer (see Table 4-4 for the names and descriptions of SSCOP timers).

integer is the time value (in tenths of a second) that you want the timer to use.

For example, the following command changes the poll timer to 2 seconds.

```
sscop/11/1# poll-timer 20
sscop/11/1#
```

Using Site Manager

To change an SSCOP/SAAL timer value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Signaling AAL (SAAL)**.	The ATM Signaling AAL Records List window opens.
4. Set one or more of the following parameters: • **Poll Timer** • **Keep Alive Timer** • **No Response Timer** • **Connection Control Timer** Click on **Help** or see the parameter descriptions beginning on page A-73.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Defining PDU Values

SSCOP/SAAL allows you to customize several values that control PDUs.

Setting the SSCOP Maximum Connection Control Value

The SSCOP maximum connection control value sets the maximum number of times the sender can transmit a BGN, END, RS, or ER PDU.

By default, the sender can transmit up to four of these messages. However, you can set this parameter to any value from 1 to 20 messages.

Using the BCC

To change the maximum connection control value, navigate to the SSCOP prompt (for example, **box; atm/11/1; signaling/11/1; sscop/11/1**) and enter:

connect-control-maximum *<integer>*

integer is the count value that you want the controller to use.

For example, the following command changes the maximum connection control value to 6:

```
sscop/11/1# connect-control-maximum 6
sscop/11/1#
```

Using Site Manager

To change the maximum connection control value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Signaling AAL (SAAL)**.	The ATM Signaling AAL Records List window opens.
4. Set the **Max Connection Control** parameter. Click on **Help** or see the parameter description on page A-75.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the SSCOP Maximum Poll Data Value

The SSCOP maximum poll data value sets the maximum value of the poll data state variable before transmitting a POLL PDU. The poll data state variable increments upon transmission of a sequenced data PDU and resets to 0 upon transmission of a POLL PDU.

By default, the maximum poll data value sets the poll data state to 25. However, you can set this parameter to any value from 1 to 120.

Using the BCC

To change the maximum poll data value, navigate to the SSCOP prompt (for example, **box; atm/11/1; signaling/11/1; sscop/11/1**) and enter:

pd-before-poll-maximum *<integer>*

integer is the count value that you want the controller to use.

For example, the following command changes the maximum poll data value to 50:

```
sscop/11/1# pd-before-poll-maximum 50
sscop/11/1#
```

Using Site Manager

To change the maximum poll data value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Signaling AAL (SAAL)**.	The ATM Signaling AAL Records List window opens.
4. Set the **Max PD Before Poll** parameter. Click on **Help** or see the parameter description on page A-75.	
5. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Setting the SSCOP Maximum STAT PDU Value

The SSCOP maximum STAT PDU value sets the maximum number of list elements allowed in a STAT PDU.

The sending device uses this value for segmentation purposes. When the number of list elements exceeds this value, the STAT message segments. As a general rule, the default value, 67, causes the STAT PDU to fill six ATM cells using AAL 5. You can set this value to any odd integer from 3 to 119.

Using the BCC

To change the maximum number of list elements allowed in a STAT PDU, navigate to the SSCOP prompt (for example, **box; atm/11/1; signaling/11/1; sscop/11/1**) and enter:

stat-pdu-elements-maximum *<integer>*

integer is the maximum number of elements (any odd number from 3 to 119) allowed in a STAT PDU.

For example, the following command changes the maximum number of STAT PDU elements to 81:

```
sscop/11/1# stat-pdu-elements-maximum 81
sscop/11/1#
```

Using Site Manager

To change the maximum number of list elements allowed in a STAT PDU, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Signaling AAL (SAAL)**.	The ATM Signaling AAL Records List window opens.
4. Set the **Max STAT PDU Elements** parameter. Click on **Help** or see the parameter description on page A-76.	
5. Click on **Done**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	**Go to**
Learn about ATM concepts.	Chapter 1
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 5
Customizing PVC Service Records and PVCs

When you start ATM on the router, all parameters use their default values. Depending on the requirements of your network, you may want to change some of these values.

This chapter describes how to customize PVC service record parameters and how to define the PVCs that operate on PVC service records. It includes the following information:

This chapter describes how to customize existing PVC service records and PVCs. For instructions on how to define a new PVC service record and PVC, see Chapter 2, "Starting ATM and ATM Router Redundancy."

Disabling and Reenabling a PVC Service Record

By default, you enable a service record when you add it to the interface. However, you can disable and reenable a specific service record at any time. Disable the service record to stop traffic flow over it and any of its VCs. Otherwise, enable the service record.

Using the BCC

To disable a PVC service record, navigate to the service record prompt (for example, **box; atm/11/1; pvc-service/boston**) and enter:

state disabled

For example, the following command disables the PVC service record:

```
pvc-service/boston# state disabled
pvc-service/boston#
```

To reenable a PVC service record, navigate to the prompt and enter:

state enabled

For example, the following command reenables the PVC service record:

```
pvc-service/boston# state enabled
pvc-service/boston#
```

Using Site Manager

To disable or reenable a PVC service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Set the **Enable/Disable** parameter. Click on **Help** or see the parameter description on page A-14.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Defining the Service Record MTU

The MTU is the largest possible unit of data that the PVC service record can transmit. By default, the service record allows an MTU size of 4608 octets. This value can handle most packet sizes.

The MTU size is typically determined by the driver. However, you can override the driver default to accommodate connection to devices that require different MTU sizes. You can set the MTU to any value from 1 to 9188 octets.

Note: Some ATM devices do not negotiate MTU size. When connecting to such a device, Nortel Networks recommends that you specify an MTU size of 9188 octets for full compatibility with RFC 1577.

Using the BCC

To change the MTU value of the ATM service record, navigate to the service record prompt (for example, **box; atm/11/1; pvc-service/boston**) and enter:

mtu *<integer>*

integer is the MTU size in octets that you want the PVC service record to use.

For example, the following command sets the service record MTU size to 9188 octets:

```
pvc-service/boston# mtu 9188
pvc-service/boston#
```

Using Site Manager

To change the MTU size for a service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Set the **MTU** parameter. Click on **Help** or see the parameter description on page A-19.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Changing the Service Name

The service name is a value that uniquely defines each service record you create. In the BCC, you enter the service name when you create the service record. You cannot change that name. To use a different service name, you must create a new service record.

In Site Manager, however, the router arbitrarily assigns a unique value to each service record you create. You can accept the value that the router assigns, or change that value to any alphanumeric string. However, each service record must have a unique service name.

Using the BCC

You cannot change the service name in the BCC after you use it to create a service record. To use a different service name, you must create a new service record. For information about creating a service record using the BCC, see "Defining an ATM Service Record" on page 2-3.

Using Site Manager

To change the service name, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the service record that you want to modify.	
5. Set the **Service Name** parameter. Click on **Help** or see the parameter description on page A-20.	
6. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Deleting a Service Record

You can use the BCC or Site Manager to delete a PVC service record.

Using the BCC

To delete a PVC service record, navigate to the service record prompt (for example, **box; atm/11/1; pvc-service/boston**) and enter:

delete

For example, the following command deletes PVC service record boston:

```
pvc-service/boston# delete
atm/11/1#
```

Using Site Manager

To delete a PVC service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to delete.	
5. Click on **Delete**.	Site Manager deletes the service record.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Designating a PVC as Hybrid/Bridged

PVCs do not typically allow for bridging in nonmeshed environments. If your network combines bridging and routing over the same interface, you need to use the service record portion of each PVC for routing, while at the same time allowing bridging to operate. To do this, you must define the PVC as a hybrid/ bridged VC.

By default, a PVC does not operate as a hybrid/bridged VC. However, you can configure any PVC to operate as one.

Note: When you define a PVC as a hybrid/bridged VC, Site Manager provides additional Bridge, Spanning Tree, Source Routing (SR), SR Spanning Tree, Translational/Learning bridge (Translate/LB), and Native Mode LAN (NML) protocol options. These protocols run on the PVC along with the protocols defined in the ATM service record.

For more information about PVC access methods, including hybrid access, see "PVC Access Methods" on page 1-17.

To designate a PVC as hybrid/bridged, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Set the **Hybrid/Bridged VC** parameter. Click on **Help** or see the parameter description on page A-22.	
7. Click on **Done**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling a PVC

By default, a PVC is enabled (Up) when you add it to the service record. However, you can disable or reenable the PVC at any time.

When the PVC is enabled, traffic can flow over it. When the PVC is disabled, traffic cannot flow over it.

Using the BCC

To disable a PVC, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

state disabled

For example, the following command disables the PVC:

```
pvc/11/1/0/32# state disabled
pvc/11/1/0/32#
```

To reenable the PVC, navigate to the PVC prompt and enter:

state enabled

For example, the following command reenables the PVC:

```
pvc/11/1/0/32# state enabled
pvc/11/1/0/32#
```

Using Site Manager

To disable or reenable a PVC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set the **Administrative State** parameter. Click on **Help** or see the parameter description on page A-22.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Modifying ATM Traffic Parameters

You can modify the following traffic parameters for PVCs:

- Peak cell rate (PCR)
- Sustainable cell rate (SCR)
- Maximum burst size (MBS)

For additional information about traffic parameters, see “ATM Traffic Parameters” on page 1-23.

Setting the PCR

The peak cell rate (PCR) specifies the upper traffic limit, in cells/s, that the ATM connection can support.

By default, the PCR is set to 4716 cells/s. Table 5-1 lists the valid ranges for each Nortel Networks ATM router.

Table 5-1. Valid PCR Ranges

ATM Router	Range (Cells/s)
ATM ARE OC-3 SONET/SDH ILI pairs	128 to 353,207
Model 5782 VNR	128 to 353,207
ATM ARE DS-3 ILI pairs	128 to 96,000
ATM ARE E-3 ILI pairs; G.832 framing mode	128 to 80,000
ATM ARE E-3 ILI pairs; G.751 framing mode	128 to 72,000

For additional information about the PCR, see “Using the PCR” on page 1-24.

Using the BCC

To change the PCR value for a PVC, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

pcr *<integer>*

integer is the PCR value that you want the PVC to use.

For example, the following command changes the PVC PCR value to 8000:

```
pvc/11/1/0/32# pcr 8000
pvc/11/1/0/32#
```

Using Site Manager

To change the PVC PCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set the **Xmit Peak Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter description on page A-23.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Setting the SCR

The sustainable cell rate (SCR) is the upper bound on the conforming average rate of an individual PVC or control VC. The *average rate* is the number of cells transmitted over the link divided by the duration of the connection. The *duration of the connection* is the total amount of time it takes from connection setup to connection release.

By default, the SCR is set to 4716 cells/s. Table 5-2 lists the valid ranges for each Nortel Networks ATM router. To disable the SCR, set the value to 0.

Table 5-2. Valid SCR Ranges

ATM Router	**Range (Cells/s)**
ATM ARE OC-3 SONET/SDH ILI pairs	0, 128 to 353,207
Model 5782	0, 128 to 353,207
ATM ARE DS-3 ILI pairs	0, 128 to 96,000
ATM ARE E-3 ILI pairs; G.832 framing mode	0, 128 to 80,000
ATM ARE E-3 ILI pairs; G.751 framing mode	0, 128 to 72,000

For additional information about the SCR, see “Using the SCR” on page 1-25.

Using the BCC

To change the PVC SCR value, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

scr *<integer>*

integer is the SCR value that you want the PVC to use.

For example, the following command changes the PVC SCR value to 8000:

```
pvc/11/1/0/32# scr 8000
pvc/11/1/0/32#
```

Using Site Manager

To change the PVC SCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set the **Xmit Sustainable Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter description on page A-24.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Setting the MBS

The maximum burst size (MBS) specifies the maximum number of sequential cells allowed on a VC before that VC must relinquish bandwidth to other VCs waiting to transmit. This burst occurs at or close to the peak cell rate.

When setting the MBS, you should select a value larger than the largest packet that the PVC can transmit (that is, the size of the maximum AAL CPCS transmit SDU). For example, if your PVC accepts packets that are less than 4608 bytes long (PVC default), set your MBS value between 45 and 50 cells.

By default, the MBS is set to 40 cells. However, you can set the MBS to any value from 1 to 65,535 cells.

For additional information about the MBS, see "Using the MBS" on page 1-26. For information about setting the maximum AAL CPCS transmit SDU size, see "Modifying the Maximum AAL CPCS SDU Size" on page 5-17.

Using the BCC

To change the PVC MBS value, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

tx-burst-size *<integer>*

integer is the MBS value that you want the PVC to use.

For example, the following command changes the PVC MBS value to 80 cells:

```
pvc/11/1/0/32# tx-burst-size 80
pvc/11/1/0/32#
```

Using Site Manager

To change the PVC MBS value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set the **Xmit Burst Size (cells)** parameter. Click on **Help** or see the parameter description on page A-25.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Modifying the Maximum AAL CPCS SDU Size

The maximum AAL common part convergence sublayer (CPCS) service data unit (SDU) value defines the maximum packet size you intend the PVC to transmit or receive.

Setting the Transmit SDU Size

Nortel Networks suggests that you accept the default value of 4608 bytes for the maximum AAL CPCS SDU size that the VC supports in the transmit direction. Most packet sizes fall well within this limit. However, you can set the transmit SDU size to any value from 1 to 65,535 bytes.

Using the BCC

To change the transmit SDU size for the PVC, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

tx-sdu-maximum *<integer>*

integer is the maximum SDU size that you want the PVC to transmit.

For example, the following command changes the maximum transmit SDU size to 65,535 bytes:

```
pvc/11/1/0/32# tx-sdu-maximum 65535
pvc/11/1/0/32#
```

Using Site Manager

To change the maximum transmit SDU size for a PVC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set the **Maximum AAL CPCS Transmit SDU Size** parameter. Click on **Help** or see the parameter description on page A-25.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Setting the Receive SDU Size

Nortel Networks suggests that you accept the default value of 4608 bytes for the maximum AAL CPCS SDU size that the PVC supports in the receive direction. Most packet sizes fall well within this limit. However, you can set the receive SDU size to any value from 1 to 65,535 bytes.

Using the BCC

To change the receive SDU size for the PVC, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

rx-sdu-maximum *<integer>*

integer is the maximum SDU size that you want the PVC to receive.

For example, the following command changes the maximum receive SDU size to 65,535 bytes:

```
pvc/11/1/0/32# rx-sdu-maximum 65535
pvc/11/1/0/32#
```

Using Site Manager

To change the maximum receive SDU size for a PVC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
7. Set the **Maximum AAL CPCS Receive SDU Size** parameter. Click on **Help** or see the parameter description on page A-26.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Assigning a Data Encapsulation Type

You can choose LLC/SNAP (the default value), NULL, or NLPID data encapsulation to operate on the PVC. Assigning the data encapsulation type at the PVC level overrides the encapsulation type assigned at the service record level.

Note: If you select NULL, the router interprets this as virtual, channel-based multiplexing, which is not supported for bridging.

For additional information about assigning data encapsulation types, see “Data Encapsulation Methods” on page 1-13.

Using the BCC

To change the data encapsulation for a PVC, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

encapsulation *<type>*

type is one of the following data encapsulation types:

- **llc/snap**
- **null**
- **nlpid**

For example, the following command changes the data encapsulation type for the PVC to NLPID encapsulation:

pvc/11/1/0/32# **encapsulation nlpid**
pvc/11/1/0/32#

Using Site Manager

To change the PVC data encapsulation type, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set the **Data Encapsulation Type** parameter. Click on **Help** or see the parameter description on page A-26.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Changing PVC OAM Parameters

The Operations and Management (OAM) feature provides a mechanism by which ATM devices can receive prompt notification of PVC failures. OAM uses special loopback cells or alarms to detect PVC failures. These mechanisms decrease the amount of time between an actual PVC failure and when the router is aware of this failure. When using OAM loopback cells, the time can decrease to only a few seconds; when using OAM alarms, the detection is almost instantaneous.

To change the PVC OAM parameters, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record that you want to modify.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to modify.	
7. Set one or more of the following parameters: • **OAM Loopback Enable** • **OAM Loopback Cell Interval** • **OAM Threshold 1** • **OAM Threshold 2** • **OAM Alarm Enable** See the parameter descriptions beginning on page A-78.	
8. Click on **Apply**.	
9. Click on **Done**.	You return to the ATM Service Records List window.
10. Click on **Done**.	You return to the Edit ATM Connector window.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
11. Click on **Done**.	You return to the Select Connection Type window.
12. Click on **Done**.	You return to the Configuration Manager window.

Copying a PVC

Note: When copying a hybrid PVC, the copy function copies all existing PVC-specific information to the new PVC. However, this function does not copy the protocols that you selected and configured for that PVC. You must select and configure any protocols that you want to operate over the newly copied PVC.

To copy an existing PVC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record containing the PVC that you want to copy.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to copy.	
7. Click on **Copy**.	The ATM Virtual Channel Link Parameters window opens.
8. Set the **VPI Number** parameter. Click on **Help** or see the parameter description on page A-21.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
9. Set the **VCI Number** parameter. Click on **Help** or see the parameter description on page A-21.	
10. Click on **OK**.	You return to the ATM Virtual Channel Link window.
11. Click on **Done**.	You return to the ATM Service Records List window.
12. Click on **Done**.	You return to the Edit ATM Connector window.
13. Click on **Done**.	You return to the Select Connection Type window.
14. Click on **Done**.	You return to the Configuration Manager window.

Deleting a PVC

You can use the BCC or Site Manager to delete a PVC.

Using the BCC

To delete a PVC, navigate to the PVC prompt (for example, **box; atm/11/1; pvc-service/boston; pvc/11/1/0/32**) and enter:

delete

For example, the following command deletes PVC 11/1/0/32 from service record boston:

```
pvc/11/1/0/32# delete
pvc-service/boston#
```

Using Site Manager

To delete a PVC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the PVC service record containing the PVC that you want to delete.	
5. Click on **PVC**.	The ATM Virtual Channel Link window opens.
6. Click on the PVC that you want to delete.	
7. Click on **Delete**.	Site Manager deletes the PVC.
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	Go to
Learn about ATM concepts.	Chapter 1
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 6
Customizing Classical IP Service Records

When you start ATM on the router, all parameters use their default values. Depending on the requirements of your network, you may want to change some of these values.

This chapter describes how to customize ATM classical IP service record parameters and includes the following information:

For general information about classical IP, see "Classical IP over ATM Concepts" on page 1-28.

Disabling and Reenabling a Classical IP Service Record

By default, you enable a classical IP service record when you add it to the interface. However, you can disable or reenable a specific service record at any time. Disable the service record to stop traffic flow over it and any of its VCs. Otherwise, enable the service record.

Using the BCC

To disable a classical IP service record, navigate to the service record prompt (for example, **box; atm/11/1; classical-ip-service/dallas**) and enter:

state disabled

For example, the following command disables the service record:

```
classical-ip-service/dallas# state disabled
classical-ip-service/dallas#
```

To reenable the service record, navigate to the prompt and enter:

state enabled

For example, the following command reenables the service record:

```
classical-ip-service/dallas# state enabled
classical-ip-service/dallas#
```

Using Site Manager

To disable or reenable a classical IP service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the classical IP service record that you want to modify.	
5. Set the **Enable/Disable** parameter. Click on **Help** or see the parameter description on page A-14.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling User Part Autogeneration

By default, when you add an SVC service record (that is, a LANE or classical IP service record), the user part autogeneration feature is enabled. However, you can disable or reenable this feature on an individual service record at any time.

For information about setting the end-station identifier for user part autogeneration, see “Autogenerating ATM Addresses” on page 3-18.

Using the BCC

To disable the user part autogeneration feature, navigate to the service record prompt (for example, **box; atm/11/1; classical-ip-service/dallas**) and enter:

autogenerate disabled

For example, the following command disables user part autogeneration on the service record:

```
classical-ip-service/dallas# autogenerate disabled
classical-ip-service/dallas#
```

To reenable user part autogeneration on the service record, navigate to the prompt and enter:

autogenerate enabled

For example, the following command reenables user part autogeneration on the service record:

```
classical-ip-service/dallas# autogenerate enabled
classical-ip-service/dallas#
```

Note: If you disable autogeneration, you must manually enter an ATM address user part. See “Entering an ATM Address User Part” on page 6-8.

Using Site Manager

To disable or reenable user part autogeneration on a classical IP service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the classical IP service record that you want to modify.	
5. Set the **User Part Autogeneration** parameter. Click on **Help** or see the parameter description on page A-16.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Entering an ATM Address Network Prefix

The ATM address network prefix specifies the ATM domain of which the service record is a part. This 13-byte portion of the ATM address can range from *XX*000000000000000000000000 to *XX*FFFFFFFFFFFFFFFFFFFFFFFF.

The *XX* byte must contain 39, 45, or 47. These values define the authority and format identifier (AFI). The AFI byte identifies the group responsible for allocating the prefix and the format the prefix uses. For more information about the AFI byte, refer to the ATM Forum UNI specification.

Entering an ATM address network prefix is optional. If you do not enter a network prefix in the specified range, the service record accepts the first prefix value that it receives from the switch.

Using the BCC

To assign an ATM address network prefix to a classical IP service record, navigate to the service record prompt (for example, **box; atm/11/1; classical-ip-service/dallas**) and enter:

network-prefix *<address>*

address is the ATM address network prefix that you want the VCs on the service record to use.

For example, the following command defines the ATM address network prefix on the service record as 39000000000000000000000000:

```
classical-ip-service/dallas# network-prefix 39000000000000000000000000
classical-ip-service/dallas#
```

Using Site Manager

To assign an ATM address network prefix to a classical IP service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the classical IP service record that you want to modify.	
5. Set the **ATM Addr Net Prefix** parameter. Click on **Help** or see the parameter description on page A-17.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Entering an ATM Address User Part

The ATM address user part (suffix) consists of a 6-byte end-station identifier and a 1-byte selector field. This 7-byte portion of the ATM address can range from 00000000000000 to FEFFFFFFFFFFFF.

You can either autogenerate this value (see "Disabling and Reenabling User Part Autogeneration" on page 6-4) or you can enter the value manually.

Using the BCC

To assign an ATM address user part to a classical IP service record, navigate to the service record prompt (for example, **box; atm/11/1; classical-ip-service/dallas**) and enter:

user-suffix *<address>*

address is the ATM address user part that you want the VCs on the service record to use.

For example, the following command defines the ATM address user part on the service record as 00000000000001:

```
classical-ip-service/dallas# user-suffix 00000000000001
classical-ip-service/dallas#
```

Using Site Manager

To assign an ATM address user part to a classical IP service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the classical IP service record that you want to modify.	
5. Set the **ATM Addr User Part** parameter. Click on **Help** or see the parameter description on page A-16.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Deleting a Service Record

You can use the BCC or Site Manager to delete a classical IP service record.

Using the BCC

To delete a classical IP service record, navigate to the service record prompt (for example, **box; atm/11/1; classical-ip-service/dallas**) and enter:

delete

For example, the following command deletes classical IP service record dallas:

```
classical-ip-service/dallas# delete
atm/11/1#
```

Using Site Manager

To delete a classical IP service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the classical IP service record that you want to delete.	
5. Click on **Delete**.	Site Manager deletes the service record.
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	Go to
Learn about ATM concepts.	Chapter 1
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 7
Customizing LAN Emulation Service Records and Clients

When you start ATM on the router, all parameters use their default values. Depending on the requirements of your network, you may want to change some of these values.

This chapter describes how to customize an existing LANE service record and the LAN emulation client (LEC) that operates on that service record. It includes the following information:

(continued)

For information about how to define a new LANE service record, see Chapter 3, "Customizing an ATM Interface."

Disabling and Reenabling a LANE Service Record

By default, you enable a service record when you add it to the interface. However, you can disable and reenable a specific service record at any time. Enable the service record to allow traffic to flow over it and any of its VCs. Otherwise, disable the service record.

Using the BCC

To disable a LANE service record, navigate to the LANE service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

state disabled

For example, the following command disables the LANE service record newyork:

```
lec-service/newyork# state disabled
lec-service/newyork#
```

To reenable the LANE service record, navigate to the LANE service record prompt and enter:

state enabled

For example, the following command reenables the LANE service record newyork:

```
lec-service/newyork# state enabled
lec-service/newyork#
```

Using Site Manager

To disable or reenable a LANE service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Set the **Enable/Disable** parameter. Click on **Help** or see the parameter description on page A-14.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling User Part Autogeneration

By default, when you add an SVC service record (that is, a LANE or classical IP service record), the user part autogeneration feature is enabled. However, you can disable or reenable this feature on an individual service record at any time.

For information about setting the end-station identifier for user part autogeneration, see "Autogenerating ATM Addresses" on page 3-18.

Using the BCC

To disable the user part autogeneration feature, navigate to the LANE service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

autogenerate disabled

For example, the following command disables user part autogeneration on the service record newyork:

```
lec-service/newyork# autogenerate disabled
lec-service/newyork#
```

To reenable user part autogeneration on the service record, navigate to the LANE service record prompt and enter:

autogenerate enabled

For example, the following command reenables user part autogeneration on the service record newyork:

```
lec-service/newyork# autogenerate enabled
lec-service/newyork#
```

Using Site Manager

To disable or reenable user part autogeneration on a LANE service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Set the **User Part Autogeneration** parameter. Click on **Help** or see the parameter description on page A-16.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Entering an ATM Address Network Prefix

The ATM address network prefix specifies the ATM domain of which the service record is a part. This 13-byte portion of the ATM address can range from *XX*000000000000000000000000 to *XX*FFFFFFFFFFFFFFFFFFFFFFFF.

The *XX* byte must contain 39, 45, or 47. These values define the authority and format identifier (AFI). The AFI byte identifies the group responsible for allocating the prefix and the format the prefix uses. For more information about the AFI byte, refer to the ATM Forum UNI specification.

Entering an ATM address network prefix is optional. If you do not enter a network prefix in the specified range, the service record accepts the first prefix value that it receives from the switch.

Using the BCC

To assign an ATM address network prefix to a service record, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

network-prefix *<address>*

address is the ATM address network prefix that you want the service record to use.

For example, the following command defines the ATM address network prefix on the service record as 39000000000000000000000000:

```
lec-service/newyork# network-prefix 39000000000000000000000000
lec-service/newyork#
```

Using Site Manager

To assign an ATM address network prefix to a LANE service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Set the **ATM Addr Net Prefix** parameter. Click on **Help** or see the parameter description on page A-16.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Entering an ATM Address User Part

The ATM address user part (suffix) consists of a 6-byte end-station identifier and a 1-byte selector field. This 7-byte portion of the ATM address can range from 00000000000000 to FEFFFFFFFFFFFF.

You can either autogenerate this value (see "Disabling and Reenabling User Part Autogeneration" on page 7-3) or you can enter the value manually.

Using the BCC

To assign an ATM address user part to a service record, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

user-part *<address>*

address is the ATM address user part that you want the VCs on the service record to use.

For example, the following command defines the ATM address user part on the service record as 00000000000001.

```
lec-service/newyork# user-part 00000000000001
lec-service/newyork#
```

Using Site Manager

To assign an ATM address user part to a LANE service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Set the **ATM Addr User Part** parameter. Click on **Help** or see the parameter description on page A-16.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Selecting a LEC Configuration Mode

A LEC can run in either automatic or manual mode. In automatic mode (the default selection), the LE client uses the LAN emulation server (LES) address it receives from the LAN emulation configuration server (LECS) to join an ELAN.

You can bypass the LECS by choosing manual mode. For manual mode, you must specify the LES address and the LAN type of the ELAN you want the LE client to join. For information about LAN types, see "Assigning an Emulated LAN Type" on page 7-12. For information about configuring the LES address, see "Assigning ATM LES Addresses" on page 7-17.

Using the BCC

To change the LEC configuration mode, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

config-mode *<mode>*

mode is the configuration mode that you want the LEC to use, either manual or automatic.

For example, the following command changes the LEC configuration mode to manual:

```
lec-service/newyork# config-mode manual
lec-service/newyork#
```

Using Site Manager

To change the LEC configuration mode, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Configuration Mode** parameter. Click on **Help** or see the parameter description on page A-33.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Assigning an Emulated LAN Name

Emulated LAN (ELAN) names are optional values that provide administrative assistance when you need to distinguish a LEC as belonging to one of several ELANs. You can specify an ELAN name up to 128 alphanumeric characters.

If you choose not to enter an ELAN name, the LECS assigns the LE client to an ELAN for this domain. However, because some switches do not support a default emulated LAN, Nortel Networks recommends that you assign an ELAN name to the LEC.

Using the BCC

To assign an emulated LAN name, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

emulated-lan-name *<value>*

value is the alphanumeric string that identifies the emulated LAN that you want this LEC to join.

For example, the following command assigns the LEC to the emulated LAN marketing:

```
lec-service/newyork# emulated-lan-name marketing
lec-service/newyork#
```

Using Site Manager

To assign an emulated LAN name to a LEC, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Emulated LAN Name** parameter. Click on **Help** or see the parameter description on page A-33.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Assigning an Emulated LAN Type

The emulated LAN type specifies the data frame format that the LEC uses when it joins an emulated LAN. ATM allows you to choose from three emulated LAN types: unspecified (the default), IEEE 802.3, or IEEE 802.5.

When you assign unspecified as the LAN type, the client obtains the ELAN type from the LECS when it joins an emulated LAN. When you assign IEEE 802.3 or IEEE 802.5, the client joins only Ethernet or token ring ELANs (respectively).

Note: If you set the LE client to run in manual configuration mode (see "Selecting a LEC Configuration Mode" on page 7-8), you must specify an ELAN type of IEEE 802.3 or IEEE 802.5.

Using the BCC

To change the emulated LAN type, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

lan-type *<value>*

value is the type of ELAN that you want this LEC to join: unspecified, ieee8023, or ieee8025.

For example, the following command allows the LEC to join only Ethernet (IEEE 802.3) emulated LANs:

```
lec-service/newyork# lan-type ieee8023
lec-service/newyork#
```

Using Site Manager

To change the emulated LAN type for a LANE client, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Emulated LAN Type** parameter. Click on **Help** or see the parameter description on page A-33.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Specifying an Emulated LAN Segment ID

You must specify an emulated LAN segment ID when:

- The LANE client is a token ring end station. A LANE client is a token ring end station when it resides at the edge of a token ring network.
- You are routing IP or IPX across a source route bridging (SRB) token ring network.

The emulated LAN segment ID specifies the ring ID (in decimal) on which the LANE client resides. By default, this value is set to 0. However, you can specify a value from 0 to 4095 for the token ring segment ID.

To change the emulated LAN segment ID, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Emulated LAN Segment ID** parameter. Click on **Help** or see the parameter description on page A-40.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling the LANE Client

By default, the LANE client is enabled on a service record when you assign LANE data encapsulation to that service record. However, you can disable or reenable the LANE client on a service record at any time.

To disable or reenable a LANE client, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Enable** parameter. Click on **Help** or see the parameter description on page A-32.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Specifying an Owner

Specifying a LEC owner is optional. This entry (up to 128 alphanumeric characters) provides administrative assistance when distinguishing among LECs.

To specify a LEC owner, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Owner** parameter. Click on **Help** or see the parameter description on page A-32.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Assigning ATM LES Addresses

LE clients use the LAN emulation server (LES) to establish the control direct VCC. The LEC must know the LES address to obtain this information before it can join an emulated LAN. The LES address consists of a user part and a network prefix.

If you select manual configuration mode, you must enter at least one LES address (see "Selecting a LEC Configuration Mode" on page 7-8). If you select automatic configuration mode, you do not need to enter a LES address. The LE client receives the LES ATM address from the LAN emulation configuration server (LECS).

You can configure a prioritized list of up to four LES addresses per LAN emulation client. After you assign the list of addresses, the LEC references the list and attempts to access the first LES address entry you created. If this attempt is unsuccessful, the LEC attempts to connect to the next LES address, and so on. When the LEC reaches the last address in the list, it starts again at the beginning of the list until it successfully joins an emulated LAN.

Using the BCC

To specify a LES address, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

les name *<name>* **address** *<address>*

name is a text string that you assign to identify the LES.

address is the full LES ATM address.

For example, the following command creates a LES with the name primary and the address 3900000000000000000000000000000000abcdef.

```
lec-service/newyork# les name primary address 39000000000000000000
00000000000000abcdef
les/primary#
```

Using Site Manager

To specify a LES address, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Configuration Mode** parameter to **Manual**. Click on **Help** or see the parameter description on page A-33.	
7. Click on **LES**.	The ATM LES List window opens.
8. Click on **Add**.	The LANE Redundancy window opens.
9. Set the following parameters: • **LE Server ATM Address Network Prefix** • **LE Server ATM Address User Part** Click on **Help** or see the parameter descriptions beginning on page A-42.	
10. Click on **OK**.	You return to the ATM LES List window.
11. Click on **Done**.	You return to the LAN Emulation Parameters window.
12. Click on **OK**.	You return to the ATM Service Records List window.
13. Click on **Done**.	You return to the Edit ATM Connector window.
14. Click on **Done**.	You return to the Select Connection Type window.
15. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling a LES Entry

By default, you enable a LES entry when you add it to the service record. However, you can disable or reenable a specific LES entry at any time. You enable the LES entry to allow a LEC to access that address for information. Otherwise, disable the LES entry.

Using the BCC

To disable a LES entry, navigate to the LES prompt (for example, **box; atm/11/1; lec-service/newyork; les/primary**) and enter:

state disabled

For example, the following command disables the LES primary:

```
les/primary# state disabled
les/primary#
```

To reenable a LES entry, navigate to the LES prompt and enter:

state enabled

For example, the following command reenables the LES primary:

```
les/primary# state enabled
les/primary#
```

Using Site Manager

To disable or reenable a LES entry, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Click on **LES**.	The ATM LES List window opens.
7. Click on the LES that you want to modify.	
8. Set the **Enable** parameter. Click on **Help** or see the parameter description on page A-42.	
9. Click on **Done**.	You return to the LAN Emulation Parameters window.
10. Click on **OK**.	You return to the ATM Service Records List window.
11. Click on **Done**.	You return to the Edit ATM Connector window.
12. Click on **Done**.	You return to the Select Connection Type window.
13. Click on **Done**.	You return to the Configuration Manager window.

Changing the LE Server Name

The LE server name is a value that uniquely defines each LAN emulation server (LES) that you create. In the BCC, you enter the LE server name when you create the LES. You cannot change that name. To use a different name, you must add a new LE server to the configuration.

In Site Manager, however, the router arbitrarily assigns a unique value to each LE server that you add. You can accept the value that the router assigns, or change that value to any alphanumeric string. However, each LE server must have a unique name.

Using the BCC

You cannot change the LE server name in the BCC after you use it to add a LES. To use a different name, you must add a new LES to the configuration. For information about adding a LES using the BCC, see "Assigning ATM LES Addresses" on page 7-17.

Using Site Manager

To change the LE server name, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Click on **LES**.	The ATM LES List window opens.
7. Set the **LE Service Name** parameter. Click on **Help** or see the parameter description on page A-43.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Inserting a LES Address Out of Sequence

Note: You cannot insert a LES address out of sequence using the BCC. The BCC uses the first LES that you enter as the primary, the second LES as the secondary, and so on.

Using Site Manager, you can insert a LES address between two existing LES addresses by completing the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Click on **LES**.	The ATM LES List window opens.
7. Click on the LES address in the list after which you want to add the new address.	The settings for this LES appear in the parameter boxes.
8. Click on **Add After**.	The LANE Redundancy window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
9. Set the following parameters: • **LE Server ATM Address Network Prefix** • **LE Server ATM Address User Part** Click on **Help** or see the parameter descriptions beginning on page A-42.	
10. Click on **OK**.	You return to the ATM LES List window.
11. Click on **Done**.	You return to the LAN Emulation Parameters window.
12. Click on **OK**.	You return to the ATM Service Records List window.
13. Click on **Done**.	You return to the Edit ATM Connector window.
14. Click on **Done**.	You return to the Select Connection Type window.
15. Click on **Done**.	You return to the Configuration Manager window.

Modifying a LES Entry

You can modify the parameters associated with a LES entry at any time. To modify a LES entry, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Click on **LES**.	The ATM LES List window opens.
7. Click on the LES that you want to modify.	
8. Set one or more of the following parameters: • **Enable** • **LE Server ATM Address Network Prefix** • **LE Server ATM Address User Part** Click on **Help** or see the parameter descriptions beginning on page A-42.	
9. Click on **Done**.	You return to the LAN Emulation Parameters window.
10. Click on **OK**.	You return to the ATM Service Records List window.
11. Click on **Done**.	You return to the Edit ATM Connector window.
12. Click on **Done**.	You return to the Select Connection Type window.
13. Click on **Done**.	You return to the Configuration Manager window.

Deleting a LES Entry

You can delete a LES entry at any time.

Using the BCC

To delete a LES, navigate to the LES prompt (for example, **box; atm/11/1; lec-service/newyork; les/primary**) and enter:

delete

For example, the following command deletes the LES primary:

```
les/primary# delete
lec-service/newyork#
```

Using Site Manager

To delete a LES address, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Click on **LES**.	The ATM LES List window opens.
7. Click on the LES address that you want to delete.	The settings for this LES appear in the parameter boxes.
8. Click on **Delete**.	
9. Click on **Done**.	You return to the LAN Emulation Parameters window.
10. Click on **OK**.	You return to the ATM Service Records List window.
11. Click on **Done**.	You return to the Edit ATM Connector window.
12. Click on **Done**.	You return to the Select Connection Type window.
13. Click on **Done**.	You return to the Configuration Manager window.

Setting the Maximum Data Frame Size

The maximum data frame size is the largest frame that the LE client can:

- Send on the multicast send VCC.
- Receive on the multicast forward VCC.
- Send and receive on data direct VCCs.

When you accept the default, unspecified, the LEC obtains the maximum data frame size when it joins an ELAN. However, you can limit the maximum data frame size that the LEC can transmit or receive to 1516 octets.

Using the BCC

To change the maximum data frame size, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

maximum-data-frame-size *<value>*

value is the maximum data frame size that you want the LEC to transmit, either unspecified or 1516.

For example, the following command changes the maximum data frame size to 1516 octets:

```
lec-service/newyork# maximum-data-frame-size 1516
lec-service/newyork#
```

Using Site Manager

To change the maximum data frame size, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Maximum Data Frame Size** parameter. Click on **Help** or see the parameter description on page A-34.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Controlling Unknown Frame Distribution

A frame is considered unknown when the LE client does not recognize the destination MAC address. An unknown frame goes to the broadcast and unknown server (BUS) for distribution. Setting unknown frame variables helps to limit unknown frame traffic to the BUS.

To control the distribution of unknown frames, you can specify the following:

- Maximum number of unknown frames that the LEC can send
- Amount of time allowed to send the unknown frames to the BUS

Setting a Maximum Unknown Frame Count

By default, a LEC can send only one unknown frame to the BUS within a specified unknown frame time (see the next section, "Specifying a Maximum Unknown Frame Time"). However, you can allow a LEC to send up to 10 unknown frames to the BUS within the maximum unknown frame time.

Using the BCC

To change the maximum unknown frame count value, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

maximum-unknown-frame *<value>*

value is the maximum number of unknown frames (from 1 to 10) that the LEC can send to the BUS within the maximum unknown frame time.

For example, the following command changes the maximum unknown frame count to 5:

```
lec-service/newyork# maximum-unknown-frame 5
lec-service/newyork#
```

Using Site Manager

To change the maximum unknown frame count, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Max Unknown Frame Count** parameter. Click on **Help** or see the parameter description on page A-36.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Specifying a Maximum Unknown Frame Time

The unknown frame time specifies the maximum amount of time allowed to send unknown frames to the BUS. For instructions on setting the unknown frame count, see “Setting a Maximum Unknown Frame Count” on page 7-28. By default, the LEC can send the allowable number of unknown frames for a maximum of 1 second. However, you can specify up to 60 seconds for the maximum unknown frame time.

For example, if you accept the default values for the unknown frame count and frame time, a LEC can send one unknown frame within 1 second for any given MAC address without having to initiate the Address Resolution Protocol (ARP) to resolve that MAC address.

Using the BCC

To change the maximum unknown frame time, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

maximum-unknown-frame-time *<value>*

value is the maximum amount of time allowed (from 1 to 60 seconds) to send the number of unknown frames.

For example, the following command changes the maximum unknown frame time to 10 seconds:

```
lec-service/newyork# maximum-unknown-frame-time 5
lec-service/newyork#
```

Using Site Manager

To change the maximum unknown frame time, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Max Unknown Frame Time** parameter. Click on **Help** or see the parameter description on page A-36.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Modifying LEC Timers and Retry Counters

You can modify the following timers and counters for each LEC:

- Control timeout
- VCC timeout period
- Maximum retry count
- Aging time
- Forward delay time
- Expected LE_ARP response time
- Path switching delay

Setting the Control Timeout

The control timeout parameter specifies the timeout period used for most request/response control frame interactions. The default timeout is 5 seconds, but you can set it to any value from 5 to 32,767 seconds.

Using the BCC

To change the control timeout, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

control-timeout *<value>*

value is the timeout period you want the LEC to use for control frame interactions.

For example, the following command changes the control timeout to 10 seconds:

```
lec-service/newyork# control-timeout 10
lec-service/newyork#
```

Using Site Manager

To change the control timeout, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Control Timeout** parameter. Click on **Help** or see the parameter description on page A-35.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Disabling and Reenabling the VCC Timeout Period

When you enable the VCC timeout period (the default setting), the LEC can release any unused data direct or multicast send VCCs after the VCC timeout period expires. The ATM drivers provide a VCC timeout period of 20 minutes. If you disable the VCC timeout period, the LEC does not release any unused data direct or multicast send VCCs.

Using the BCC

To disable the VCC timeout period, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

vcc-timeout disabled

For example, the following command disables the VCC timeout period on LANE service record newyork:

```
lec-service/newyork# vcc-timeout disabled
lec-service/newyork#
```

To reenable the VCC timeout period, navigate to the service record prompt and enter:

vcc-timeout enabled

For example, the following command reenables the VCC timeout period on LANE service record newyork:

```
lec-service/newyork# vcc-timeout enabled
lec-service/newyork#
```

Using Site Manager

To disable or reenable the VCC timeout period, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **VCC Timeout Period Enable** parameter. Click on **Help** or see the parameter description on page A-37.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Setting the Maximum Retry Count

The maximum retry count specifies the maximum number of times a LEC can retry an LE_ARP_REQUEST (following the original request) for any given frame MAC address. You can allow either one (the default) or two retries.

Using the BCC

To change the maximum retry count, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

maximum-retry-count *<value>*

value is the maximum number of times (1 or 2) that you want the LEC to retry an LE_ARP_REQUEST for any given frame MAC address.

For example, the following command changes the maximum retry count to 2:

```
lec-service/newyork# maximum-retry-count 2
lec-service/newyork#
```

Using Site Manager

To change the maximum retry count, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Max Retry Count** parameter. Click on **Help** or see the parameter description on page A-37.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Setting the Aging Time

The aging time specifies the maximum amount of time that a LEC can maintain an entry in its LE_ARP cache without having to verify the relationship of that entry.

By default, the LEC maintains entries for 300 seconds. However, you can set the aging time to a value from 10 to 300 seconds.

Using the BCC

To change the aging time, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

aging-time *<value>*

value is the number of seconds (from 10 to 300) that you want the LEC to maintain LE_ARP cache entries.

For example, the following command changes the aging time to 150 seconds:

```
lec-service/newyork# aging-time 150
lec-service/newyork#
```

Using Site Manager

To change the aging time, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Aging Time** parameter. Click on **Help** or see the parameter description on page A-38.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Setting the Forward Delay Time

As long as there are no changes occurring in the network topology, the forward delay time parameter specifies the maximum amount of time that a LEC can maintain an entry in its LE_ARP cache without having to verify the relationship of that entry.

By default, the LEC maintains entries for 15 seconds, as long as the network topology does not change. However, you can set the forward delay time to a value from 4 to 30 seconds.

Using the BCC

To change the forward delay time, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

forward-delay-time *<value>*

value is the number of seconds (from 4 to 30) that you want the LEC to maintain LE_ARP cache entries.

For example, the following command changes the forward delay time to 15 seconds:

```
lec-service/newyork# forward-delay-time 15
lec-service/newyork#
```

Using Site Manager

To change the forward delay time, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Forward Delay Time** parameter. Click on **Help** or see the parameter description on page A-38.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Specifying the Expected LE_ARP Response Time

The expected LE_ARP response time specifies the amount of time that the LEC expects an ARP request and ARP response cycle to take. The LEC uses this value during retries and verifications.

By default, the LEC expects an ARP request and ARP response cycle to take a maximum of 3 seconds. However, you can set the LE_ARP response time to a value from 1 to 30 seconds.

Using the BCC

To change the expected LE_ARP response time, navigate to the LANE service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

arp-response-time *<value>*

value is the number of seconds (from 1 to 30) that the LEC expects an ARP request and ARP response cycle to take.

For example, the following command changes the expected LE_ARP response time to 15 seconds:

```
lec-service/newyork# arp-response-time 15
lec-service/newyork#
```

Using Site Manager

To change the expected LE_ARP response time, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Expected LE_ARP Response Time** parameter. Click on **Help** or see the parameter description on page A-38.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Setting the Path Switching Delay

The path switching delay specifies the amount of time that the LEC waits after sending a frame over an existing VCC before it switches to a new VCC (this applies to multicast and data direct VCCs).

You can use the path switching delay parameter to bypass the flush protocol. When you disable the flush protocol, the data for a specific MAC address automatically begins flowing over a new VCC when the path switching delay time elapses. (For instructions on disabling the flush protocol, see "Modifying Flush Protocol Variables" on page 7-44.)

By default, the LEC waits a maximum of 6 seconds after sending a frame over an existing VCC before it switches to a new VCC. However, you can set the path switching delay to a value from 1 to 8 seconds.

Using the BCC

To change the path switching delay, navigate to the LANE service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

path-switching-delay *<value>*

value is the number of seconds (from 1 to 8) that you want the LEC to wait after sending a frame over an existing VCC before switching to a new VCC.

For example, the following command changes the path switching delay to 8 seconds:

```
lec-service/newyork# path-switching-delay 8
lec-service/newyork#
```

Using Site Manager

To change the path switching delay, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Path Switching Delay** parameter. Click on **Help** or see the parameter description on page A-39.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Modifying Flush Protocol Variables

The flush protocol ensures that data destined for a particular MAC address arrives in sequence. This means that after the LEC issues a flush request, the flush protocol drops any cells it receives for the particular MAC address until:

- The LEC receives a flush response from that MAC address.
- The flush timeout expires for that MAC address.

If the client receives a flush response from the MAC address, the cells for this MAC address begin flowing over a new virtual circuit. However, if the flush timeout expires for this MAC address, the cells begin flowing to the BUS.

Disabling and Reenabling the Flush Protocol

You can disable or reenable the flush protocol for any LEC.

When enabled (the default), the flush protocol drops cells with the current destination MAC address until the LEC receives a flush response for that MAC address or the flush timeout expires (see "Setting the Flush Timeout" on page 7-46).

When the flush protocol is disabled, cells containing the destination MAC address are dropped until the path switching delay times out. After the path switching delay time elapses, the data automatically begins flowing over a new virtual circuit.

Using the BCC

To disable the flush protocol, navigate to the LANE service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

flush-protocol disabled

For example, the following command disables the flush protocol on LANE service record newyork:

```
lec-service/newyork# flush-protocol disabled
lec-service/newyork#
```

To reenable the flush protocol, navigate to the LANE service record prompt and enter:

flush-protocol enabled

For example, the following command reenables the flush protocol on LANE service record newyork:

```
lec-service/newyork# flush-protocol enabled
lec-service/newyork#
```

Using Site Manager

To disable or reenable the flush protocol, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
6. Set the **Flush Protocol** parameter. Click on **Help** or see the parameter description on page A-40.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Setting the Flush Timeout

The flush timeout specifies the amount of time that the LEC waits to receive a flush response (after sending a flush request) before it takes recovery action by switching to the BUS.

By default, the LEC waits 4 seconds for a flush response. However, you can set the flush timeout to a value from 1 to 4 seconds.

Using the BCC

To change the flush timeout value, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

flush-timeout *<value>*

value is the number of seconds (from 1 to 4) that the LEC waits for a flush response.

For example, the following command changes the flush timeout value to 2 seconds:

```
lec-service/newyork# flush-timeout 2
lec-service/newyork#
```

Using Site Manager

To change the flush timeout value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **Flush Timeout** parameter. Click on **Help** or see the parameter description on page A-39.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Specifying a LECS ATM Address

You can specify which LAN emulation configuration server (LECS) you want the LE client to use when opening a configuration VCC to the configuration service. Entering this ATM address is optional; if you do not enter an address, the LEC uses the well-known LECS ATM address to open a configuration VCC.

Using the BCC

To specify a LECS ATM address, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

config-server-atm-address *<address>*

address is the ATM address of the LECS that you want the LEC to use.

For example, the following command specifies the LECS address 3900000000000000000000000000000000000001 for LANE service record newyork:

lec-service/newyork# **config-server-atm-address 390000000000000000000**
0000000000000000001
lec-service/newyork#

Using Site Manager

To specify a LECS ATM address, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	
5. Click on **LEC**.	The LAN Emulation Parameters window opens.

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
6. Set the **LE Config Server ATM Address** parameter. Click on **Help** or see the parameter description on page A-41.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Enabling and Disabling LAN Emulation Version 2

By default, LAN Emulation Version 2 is disabled on a service record. However, you can enable or disable this function at any time.

If the LEC operates in an MPOA environment, you must enable the LAN Emulation Version 2 function. Otherwise, disable the function.

To enable or disable the LAN Emulation Version 2 function, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LANE service record that you want to modify.	

(continued)

Site Manager Procedure *(continued)*	
You do this	**System responds**
5. Click on **LEC**.	The LAN Emulation Parameters window opens.
6. Set the **LAN Emulation Version 2** parameter. Click on **Help** or see the parameter description on page A-41.	
7. Click on **OK**.	You return to the ATM Service Records List window.
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Deleting a Service Record

You can use the BCC or Site Manager to delete a LANE service record.

Using the BCC

To delete a LANE service record, navigate to the service record prompt (for example, **box; atm/11/1; lec-service/newyork**) and enter:

delete

For example, the following command deletes the LANE service record newyork:

```
lec-service/newyork# delete
atm/11/1#
```

Using Site Manager

To delete a LANE service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the LAN emulation service record that you want to delete.	
5. Click on **Delete**.	Site Manager deletes the service record.
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	Go to
Learn about ATM concepts.	Chapter 1
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 8
Customizing WAN SVC Service Records and WAN SVCs

When you start ATM on the router, all parameters use their default values. Depending on the requirements of your network, you may want to change some of these values.

This chapter describes how to customize WAN SVC service record parameters and how to define the WAN SVCs that operate on WAN SVC service records. It includes the following information:

This chapter describes how to customize existing WAN SVC service records and WAN SVCs. For instructions on how to define a new WAN SVC service record and WAN SVC, see Chapter 2, “Starting ATM and ATM Router Redundancy.”

Disabling and Reenabling a WAN SVC Service Record

By default, you enable a service record when you add it to the interface. However, you can disable and reenable a specific service record at any time. Disable the service record to stop traffic flow over it and any of its VCs. Otherwise, enable the service record.

To disable or reenable a WAN SVC service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Set the **Enable/Disable** parameter. Click on **Help** or see the parameter description on page A-14.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Defining the Service Record MTU

The MTU is the largest possible unit of data that the WAN SVC service record can transmit. By default, the service record allows an MTU size of 4608 octets. This value can handle most packet sizes.

The MTU size is typically determined by the driver. However, you can override the driver default to accommodate connection to devices that require different MTU sizes. You can set the MTU to any value from 1 to 9188 octets.

Note: Some ATM devices do not negotiate MTU size. When connecting to such a device, Nortel Networks recommends that you specify an MTU size of 9188 octets for full compatibility with RFC 1577.

To change the MTU size for a service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Set the **MTU** parameter. Click on **Help** or see the parameter description on page A-19.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Changing the Service Name

The service name is a value that uniquely defines each service record you create. The router arbitrarily assigns a unique value to each service record you create. You can accept the assigned value, or change that value to any alphanumeric string. However, each service record must have a unique service name.

To change the service name, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Set the **Service Name** parameter. Click on **Help** or see the parameter description on page A-20.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Changing the Routing Update Policy

With WAN SVCs, you can configure one or more adjacent hosts for each circuit. The number of adjacent hosts that you configure determines the routing update policy you should use.

If you configure one adjacent host, you should choose the dial-optimized routing policy. When you choose dial-optimized routing, Site manager automatically sets the RIP broadcast timers to 1 hour. You may want to change the RIP broadcast timer to a high value (for example, 8 hours) so that SVCs are not established as often. In this configuration, the router sends routing updates whenever a data packet or a call from the other end causes ATM to establish an SVC to the adjacent host. Setting the RIP broadcast timer to a high value ensures that ATM establishes an SVC primarily because the router needs to transmit data.

If you configure more than one adjacent host, you should choose the normal routing policy. When you choose the normal routing policy, Site Manager automatically sets the RIP broadcast timers to 30 seconds. You can accept this value or change it to a higher value so that SVCs are not established as often. In this type of configuration, when the broadcast timer expires, ATM establishes any nonexisting SVCs so that the router can send routing updates simultaneously to each adjacent host.

For information on how to configure RIP timers for an IP interface, see *Configuring IP, ARP, RARP, RIP, and OSPF Services.* For information on how to configure RIP timers for an IPX interface, see *Configuring IPX Services.*

To configure the routing policy, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Set the **WAN SVC Routing Mode** parameter. Click on **Help** or see the parameter description on page A-20.	
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Deleting a Service Record

To delete a WAN SVC service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to delete.	
5. Click on **Delete**.	Site Manager deletes the service record.
6. Click on **Done**.	You return to the Edit ATM Connector window.
7. Click on **Done**.	You return to the Select Connection Type window.
8. Click on **Done**.	You return to the Configuration Manager window.

Modifying ATM Traffic Parameters

You can modify the following traffic parameters for WAN SVCs:

- Transmit and receive peak cell rate (PCR)
- Transmit and receive sustainable cell rate (SCR)

For additional information about traffic parameters, see “ATM Traffic Parameters” on page 1-23.

Enabling Traffic Parameters

To perform traffic shaping over the SVCs to any particluar adjacent host, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Click on **WAN SVC**.	The ATM WAN SVC List window opens.
6. Configure the following traffic shaping parameters: • **Enable/Disable** • **Adjacent Host ATM Address** • **Xmit Peak Cell Rate (cells/s)** • **Xmit Sustainable Cell Rate (cells/s)** • **Recv Peak Cell Rate (cells/s)** • **Recv Sustainable Cell Rate (cells/s)** Click on Help or see the parameter descriptions beginning on page A-27.	
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Specifying the Adjacent Host ATM Address

To perform traffic shaping for an adjacent host, you must enter the adjacent host ATM address. The adjacent host ATM address is a 20-bit hexadecimal representation of the IP adjacent host address or IPX adjacent host address.

Note: To complete the WAN SVC configuration you must also configure IP or IPX adjacent host entries for all routers to be connected to this router with WAN SVCs. For information about how to configure an IP adjacent host, see *Configuring IP, ARP, RARP, RIP, and OSPF Services*. For information about how to configure an IPX adjacent host, see *Configuring IPX Services*.

To set the adjacent host ATM address, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Click on **WAN SVC**.	The ATM WAN SVC List window opens.
6. Click on Add.	The WAN SVC Parameters window opens.
7. Set the **Adjacent Host ATM Address** parameter. Click on **Help** or see the parameter description on page A-20.	
8. Click on **Done**.	You return to the Edit ATM Connector window.
9. Click on **Done**.	You return to the Select Connection Type window.
10. Click on **Done**.	You return to the Configuration Manager window.

Setting the PCR

The peak cell rate (PCR) specifies the upper traffic limit, in cells/s, that the ATM connection can support.

By default, the PCR is 4716 cells/s for both the transmitting and receiving direction. Table 8-1 lists the valid ranges for each Nortel Networks ATM router.

Table 8-1. Valid PCR Ranges

ATM Router	Range (Cells/s)
ATM ARE OC-3 SONET/SDH ILI pairs	128 to 353,207
Model 5782 VNR	128 to 353,207
ATM ARE DS-3 ILI pairs	128 to 96,000
ATM ARE E-3 ILI pairs; G.832 framing mode	128 to 80,000
ATM ARE E-3 ILI pairs; G.751 framing mode	128 to 72,000

For additional information about the PCR, see “Using the PCR” on page 1-24.

To change the WAN SVC PCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Click on **WAN SVC**.	The ATM WAN SVC List window opens.
6. Click on the WAN SVC that you want to modify.	
7. Set the **Xmit Peak Cell Rate (cells/s)** and **Recv Peak Cell Rate (cells/s)**parameters. Click on **Help** or see the parameter description beginning on page A-23.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Setting the SCR

The sustainable cell rate (SCR) is the upper bound on the conforming average rate of an individual WAN SVC or control VC. The *average rate* is the number of cells transmitted over the link divided by the duration of the connection. The *duration of the connection* is the total amount of time it takes from connection setup to connection release.

By default, the SCR is 4716 cells/s for both the transmitting and receiving direction. Table 8-2 lists the valid ranges for each Nortel Networks ATM router. To disable the SCR, set the value to 0.

Table 8-2. Valid SCR Ranges

ATM Router	Range (Cells/s)
ATM ARE OC-3 SONET/SDH ILI pairs	0, 128 to 353,207
Model 5782	0, 128 to 353,207
ATM ARE DS-3 ILI pairs	0, 128 to 96,000
ATM ARE E-3 ILI pairs; G.832 framing mode	0, 128 to 80,000
ATM ARE E-3 ILI pairs; G.751 framing mode	0, 128 to 72,000

For additional information about the SCR, see “Using the SCR” on page 1-25.

To change the WAN SVC SCR value, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Click on the WAN SVC service record that you want to modify.	
5. Click on **WAN SVC**.	The ATM WAN SVC List window opens.
6. Click on the WAN SVC that you want to modify.	
7. Set the **Xmit Sustainable Cell Rate (cells/s)** and **Recv Sustainable Cell Rate (cells/s)** parameter. Click on **Help** or see the parameter descriptions beginning on page A-24.	
8. Click on **Done**.	You return to the ATM Service Records List window.
9. Click on **Done**.	You return to the Edit ATM Connector window.
10. Click on **Done**.	You return to the Select Connection Type window.
11. Click on **Done**.	You return to the Configuration Manager window.

Assigning a Data Encapsulation Type

You must use LLC/SNAP (the default value) data encapsulation to operate on the WAN SVC. You assign the LLC/SNAP data encapsulation type at service record level. See "Adding a Service Record for WAN SVCs" on page 2-11.

For additional information about assigning data encapsulation types, see "Data Encapsulation Methods" on page 1-13.

Deleting a WAN SVC Service Record

To delete a WAN SVC service record, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Service Attributes**.	The ATM Service Records List window opens.
4. Highlight the WAN SVC service record that you want to delete.	
5. Click on **Delete**.	Site Manager deletes the WAN SVC service record.
6. Click on **Done**.	You return to the ATM Service Records List window.
7. Click on **Done**.	You return to the Edit ATM Connector window.
8. Click on **Done**.	You return to the Select Connection Type window.
9. Click on **Done**.	You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	**Go to**
Learn about ATM concepts.	Chapter 1
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for the ATM router redundancy parameter.	Chapter 9
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Chapter 9
Customizing ATM Router Redundancy

Nortel Networks routers support warm standby router redundancy. This type of redundancy protects a network from the irrecoverable failure of an entire router. For general information about router redundancy, see “ATM Router Redundancy Concepts” on page 1-39.

This chapter describes how to customize an ATM router redundancy configuration.

Setting the ATM Router Redundancy Monitoring Timer

Nortel Networks ATM router redundancy uses only one ATM-specific Site Manager parameter: ATM Monitoring Timer.

Note: For instructions on how to start ATM router redundancy, see "Starting ATM Router Redundancy" on page 2-16. For instructions on how to customize router redundancy parameters, see *Configuring Interface and Router Redundancy*.

The ATM monitoring timer specifies the amount of time in milliseconds (ms) that the secondary router waits before beginning the process of becoming the primary router. By default, if the primary router experiences a loss of signal, it waits 3000 ms for the signal to return. If the signal does not return within that time, the secondary router begins the process of becoming the primary router.

You can set the ATM monitoring timer to any value from 1 to 65,535 ms.

To set the ATM monitoring timer, complete the following tasks:

Site Manager Procedure	
You do this	**System responds**
1. In the Configuration Manager window, click on the ATM interface (**ATM1**) that you want to modify.	The Select Connection Type window opens.
2. Click on **ATM**.	The Edit ATM Connector window opens.
3. Click on **Configure ATM Router Redundancy**.	The Router Redundancy Circuit window opens.
4. Set the **ATM Monitoring Timer** parameter. Click on **Help** or see the parameter description on page A-76.	
5. Click on **OK**.	You return to the Edit ATM Connector window.
6. Click on **Done**.	You return to the Select Connection Type window.
7. Click on **Done**.	You return to the Configuration Manager window.

Where to Go Next

Use the following table to determine where to go next.

If you want to	Go to
Learn about ATM concepts.	Chapter 1
Start ATM.	Chapter 2
Change default settings for ATM interface parameters.	Chapter 3
Change default settings for ATM signaling parameters.	Chapter 4
Change default settings for ATM PVC service record and PVC parameters.	Chapter 5
Change default settings for classical IP service record parameters.	Chapter 6
Change default settings for LAN Emulation client service record parameters.	Chapter 7
Change default settings for ATM WAN SVC service record and WAN SVC parameters.	Chapter 8
Obtain information about Site Manager parameters.	Appendix A
Monitor ATM using the BCC show commands.	Appendix B

Appendix A
Site Manager Parameters

After you enable an ATM circuit, you can use Site Manager to edit ATM parameters. Many ATM parameters are interdependent; how you edit some parameters depends on how you set others.

This appendix contains the Site Manager parameter descriptions for ATM services. You can display the same information using Site Manager online Help.

This appendix contains the following information:

Accessing ATM Parameters

You can access ATM parameters using either:

- A window path
- A menu path

Both of these paths begin at the Configuration Manager window.

The window path provides detailed information about individual ATM interfaces. The menu path provides global information about all interfaces on the router.

Using the Window Path

ATM uses two main windows to access ATM parameters: the Select Connection Type window and the Edit ATM Connector window.

Select Connection Type Window

To display the Select Connection Type window, click on an ATM link module interface (labeled ATM1) in the Configuration Manager window.

From the Select Connection Type window, you can do any of the following:

- Access ATM parameters.
- Access MPLS parameters.
- Access interface parameters.
- Access line parameters.
- Delete ATM or MPLS from the interface.

➡ **Note:** For information about how to configure MPLS parameters, see *Configuring MPLS Services*.

Edit ATM Connector Window

The Edit ATM Connector window acts as a control access point for all ATM parameters. This window provides information specific to each individual ATM interface.

For any given interface, the Edit ATM Connector window provides the following attribute buttons:

- Service Attributes
- MPOA Server Attributes
- ATM Signaling
- Signaling AAL (SAAL)
- Interim Local Management Interface (ILMI)
- Configure ATM Router Redundancy

By clicking on any of these buttons, you can access and edit the parameters associated with that specific ATM interface (connector).

➡ **Note:** For information about how to configure MPOA parameters, see *Configuring MPOA Services*.

To access parameters from the Edit ATM Connector window:

1. **In the Configuration Manager window, click on an ATM link module interface (labeled ATM1).**

   The Select Connection Type window opens.

2. **Click on ATM.**

   The Edit ATM Connector window opens.

3. **Click on the appropriate attribute category.**

Using the Menu Path

The Protocols menu in the Configuration Manager window provides global interface and signaling information about every ATM interface on the router. For example, if you configure four ATM link modules on the router, and you select Protocols > ATM > Interfaces, the ATM Interface List window displays all four ATM interfaces that you configured on the router.

Accessing Global ATM Signaling Attributes

To access global ATM signaling attributes:

1. **In the Configuration Manager window, click on Protocols.**
2. **Click on ATM.**
3. **Click on ATM Signaling.**

   The ATM Signaling Records List window opens.

Accessing Global ATM Interface Attributes

To access global ATM interface attributes:

1. **In the Configuration Manager window, click on Protocols.**
2. **Click on ATM.**
3. **Click on Interfaces.**

   The ATM Interface List window opens.

➡ **Note:** Because MPLS uses ATM to operate, the ATM Interface List window also displays MPLS interfaces. However, you cannot edit MPLS interface parameters from this window. For information about how to edit MPLS interface parameters, see *Configuring MPLS Services*.

ATM Line Parameters

The type of ATM link module you use determines the line details you can edit. This section describes how to edit the line details for ATM ARE link modules and the Model 5782 ATM router.

Parameter:	**Enable**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables the line driver.
Instructions:	Select Enable or Disable.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.3.2.1.2

Parameter:	**Interface MTU**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**
Default:	4608
Options:	1 to 9188
Function:	Specifies the largest packet size (in octets) that the router can transmit on this interface.
Instructions:	Enter a value that is appropriate for the network.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.3.2.1.9

Parameter:	**Data Path Enable**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**
Default:	Enable
Options:	Enable | Disable
Function:	Specifies whether or not the router disables the interface between the driver and the higher-level software (the data path interface) when you disconnect the cable from the ATM module. If you select Enable, then when you disconnect the cable from the ATM module, the router disables the data path interface after the time you specify with the Data Path Notify Timeout parameter. If you select Disable, the router does not disable the data path interface when you disconnect the cable from the ATM module.
Instructions:	Select Enable or Disable. If you select Enable, be sure to enter an appropriate value for the Data Path Notify Timeout parameter.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.3.2.1.11

Parameter:	**Data Path Notify Timeout**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**
Default:	1 second
Options:	0 to 3600 seconds
Function:	Specifies the time that the router waits before disabling the data path interface when you disconnect the cable from the ATM module, providing that you set the Data Path Enable parameter to Enable.
Instructions:	Accept the default or enter an appropriate value.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.3.2.1.12

Parameter: SVC Inactivity Timeout Enable

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**

Default: Enable

Options: Enable | Disable

Function: If you select Enable, the router disables any switched virtual circuits (SVCs) on which the router receives or transmits no cells for the number of seconds you specify using the SVC Inactivity Timeout (Secs) parameter.

If you select Disable, the router keeps SVCs open unless you close them by another method.

Instructions: Select Enable or Disable.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.3.2.1.13

Parameter: SVC Inactivity Timeout (Secs)

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**

Default: 1200 seconds

Options: 60 to 3600 seconds

Function: If the router receives or transmits no cells on an SVC for this number of seconds, it closes the SVC, providing that you set the SVC Inactivity Timeout Enable parameter to Enable.

Instructions: Enter an appropriate time, and be sure to set the SVC Inactivity Timeout Enable parameter to Enable.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.3.2.1.14

Parameter: Framing Mode

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**

Default: SONET (for OC-3 lines) | DS3_CBIT (for DS-3 lines) | E3_G832 (for E-3 lines)

Options: SDH | SONET | DS3_CBIT | CBITNOFALLBACK | CLEARCHANNEL | E3_G751 | E3_G832

Function: Specifies the transceiver mode for the physical interface.

Instructions: Select a transceiver mode as follows:

- SDH or SONET for OC-3 modules
- DS3_CBIT, CBITNOFALLBACK, or CLEARCHANNEL for DS-3 modules
- E3_G751 or E3_G832 for E-3 modules

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.3.2.1.17

Parameter: Clocking Signal Source

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**

Default: Internal

Options: Loop | Internal

Function: Specifies whether the platform uses its internal clock or derives timing signals externally from an incoming clock on this interface.

Instructions: Select Loop to use external timing signals from an incoming clock; select Internal to use the clock in the platform.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.3.2.1.18

Parameter: DS3 Line Build Out

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**

Default: Short

Options: Short | Long

Function: Conditions router signals to mitigate attenuation, which depends on the physical length of the line.

You can set this parameter only for DS-3 modules.

Instructions: Select Short for lines shorter than 225 ft; select Long for lines 225 ft or longer.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.3.2.1.23

Parameter: DS3 Scrambling

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**

Default: On

Options: On | Off

Function: If you select On, the platform randomizes cell payload sufficiently to guarantee cell synchronization. If you select Off, cell synchronization problems could occur.

Note that ATM devices with different settings for scrambling cannot communicate. For example, if you configure a router to enable scrambling and configure a hub to disable scrambling, the router and the hub cannot communicate.

You can set this parameter only when using DS-3 modules.

Instructions: Select On or Off. If you select On, be sure to enable scrambling for all devices on the network. If you select Off, be sure to disable scrambling for all devices on the network.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.3.2.1.22

Parameter:	**Per-VC Clipping**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Line Attributes**
Default:	Disable
Options:	Enable | Disable
Function:	Enables or disables cell clipping on a per-VC basis.
Instructions:	Accept the default, Disable, for normal VC clipping. Enable this parameter if you want to clip cells on a per-VC basis.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.3.1.1.17

ATM Interface Parameters

Interface parameters define the state of the ATM interface.

Parameter:	**Administrative State**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Interface Attributes**
Default:	Up
Options:	Up | Down
Function:	Specifies whether this interface is enabled or disabled.
Instructions:	Accept the default, Up, if you want traffic to flow over this interface. Set the state to Down if you do not want traffic to flow over this interface.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.1.1.3

Parameter:	**Enable ATM Signaling**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Interface Attributes**
Default:	Enable
Options:	Enable | Disable
Function:	Specifies whether ATM signaling is enabled or disabled for this interface. Signaling allows you to configure switched features (for example, SVCs and LANE) on the interface. If you do not intend to configure any switched features on this interface (that is, you want this interface to run only PVCs), disabling this parameter makes additional system resources available.
Instructions:	Accept the default, Enable, if you want to enable signaling on this interface. Set the state to Disable if you want to disable signaling on this interface.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.1.1.16

Parameter:	**Use Hardware MAC Address**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **Interface Attributes**
Default:	Enable
Options:	Enable | Disable
Function:	Specifies whether or not to use the hardware MAC address for this interface. When enabled, the Configuration Manager uses the ATM hardware MAC address of the link module as the end-station identifier when automatically generating the user part (suffix) of an SVC service record ATM address. When disabled, the Configuration Manager uses the value specified in the MAC Address Override parameter to assign the end-station identifier when automatically generating the user part (suffix) of an SVC service record ATM address.
Instructions:	Accept the default, Enable, if you want to use the MAC address of the ATM interface when automatically generating the end-station identifier portion of the ATM address user part. Set this parameter to Disable if you want to use the MAC Address Override value when automatically generating the end-station identifier portion of the ATM address user part. If you set this parameter to Disable, you must enter a value for the MAC Address Override parameter.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.1.1.18

Parameter: **MAC Address Override**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **Interface Attributes**

Default: None

Options: Any valid MAC address

Function: Specifies the hardware MAC address for this interface. Also defines the end-station identifier for this interface when automatically generating the user part (suffix) of an SVC service record ATM address.

Using the MAC Address Override parameter is very helpful when you want to hot-swap ATM link modules.

For example, when hot-swapping ATM link modules, you can enter the MAC address of the original ATM link module as the MAC Address Override value for the new ATM link module. This allows you to keep the information already configured on the existing ATM link module while maintaining the integrity of the existing client information on the network.

Instructions: Enter a valid MAC address.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.1.1.19

ATM Service Record Parameters

Service record parameters define the ATM service records for an interface. The ATM Service Records List window also provides access to the following:

- PVC parameters (PVC service records only) in the ATM Virtual Channel Link window
- A list of all SVCs on that service record (SVC service records only) in the ATM Switched Virtual Circuit List window
- LEC parameters (SVC service records using LANE data encapsulation) in the LAN Emulation Parameters window

Parameter:	**Enable/Disable**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables this service record.
Instructions:	Accept the default, Enable, if you want traffic to flow on this service record and its VCs. Set to Disable if you do not want traffic to flow on this service record or any of its VCs.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.2.1.2

Parameter: Data Encapsulation Type

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

Default: LANE (signaling enabled) or LLC/SNAP (signaling disabled)

Options: LANE | LLC/SNAP | NLPID | NULL

Function: Identifies the data encapsulation type for this service record.

Select a data encapsulation type as follows:

- LLC/SNAP, NLPID, or NULL for service records containing PVCs
- LLC/SNAP for service records containing hybrid PVCs
- LANE for service records containing SVCs over which you want to run LAN emulation
- LLC/SNAP or NULL for WAN SVCs, or for service records containing SVCs over which you want to run classical IP (RFC 1577)

If you select NULL, the router interprets this as virtual, channel-based multiplexing, which is not supported for bridging.

Instructions: Select a data encapsulation type.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.5

Parameter: Virtual Connection Type

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

Default: SVC (signaling enabled) or PVC (signaling disabled)

Options: PVC | SVC | MUXED_SVC

Function: Identifies the virtual connection type of this service record.

Instructions: Accept the default, SVC, if you want the service record to contain switched virtual circuits. Select PVC if you want the service record to contain permanent virtual circuits. Select MUXED_SVC if you want the service record to contain WAN switched virtual circuits.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.7

Parameter: User Part Autogeneration

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**

Default: Enable

Options: Enable | Disable

Function: Enables or disables autogeneration of the ATM address user part. Depending on the settings in the ATM Interface Attributes window, the ATM address user part is either the hardware MAC address or a MAC address override value.

Instructions: Accept the default, Enable, if you want the router to automatically generate the ATM address user part for the SVC service record.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.11

Parameter: ATM Addr User Part

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**

Default: None

Options: 00000000000000 to FEFFFFFFFFFFFF

Function: The router allows you to autogenerate this parameter (see the User Part Autogeneration parameter on A-16). Depending on the settings in the ATM Interface Attributes window, this parameter autogenerates this address using either:

- The 6-byte hardware MAC address of the ATM interface
- A MAC address override value that you specify

In both cases, autogeneration creates a unique selector byte for each service record on the interface.

Instructions: Accept the default for autogeneration, or enter a value in the range specified.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.9

Parameter: ATM Addr Net Prefix (Optional)

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**

Default: None

Options: *XX*000000000000000000000000 to *XX*FFFFFFFFFFFFFFFFFFFFFFFF

where *XX* = 39, 45, or 47

Function: Specifies the network prefix of the ATM address for this service record. The network prefix specifies the ATM domain of which this service record is a part.

The *XX* byte must contain 39, 45, or 47. These values define the authority and format identifier (AFI). The AFI byte identifies the group responsible for allocating the prefix and the format the prefix uses. For more information about the AFI byte, see the ATM Forum UNI specification.

Instructions: Setting this parameter is optional. If you do not enter an ATM address network prefix in the range specified above, the service record accepts the first prefix value that it receives from the switch.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.8

Parameter: **Emulated LAN Name**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Default ELAN

Options: Leave blank or enter up to 128 alphanumeric characters

Function: Specifies the name of the emulated LAN that this LE client joins when it joins an emulated LAN. Clients that use automatic configuration mode use this parameter in their LE_CONFIGURE_REQUEST frames. Clients that use manual configuration mode use this parameter in their LE_JOIN_REQUEST frames.

Entering an ELAN name is optional. If you choose not to enter an ELAN name, the LAN emulation configuration server (LECS) assigns the LE client to an ELAN for this domain. However, because some switches do not support a default emulated LAN, Nortel Networks recommends that you assign an ELAN name to the LE client.

Instructions: Either leave this parameter blank or enter an ELAN name (up to 128 alphanumeric characters) that identifies the emulated LAN you want this client to join.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.8

Parameter: Emulated LAN Type

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **Add**

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Unspecified

Options: Unspecified | IEEE8023 | IEEE8025

Function: Specifies the data frame format this client uses when it joins an emulated LAN. Clients that use automatic configuration mode use this parameter in their LE_CONFIGURE_REQUEST frames to specify the LAN type. Clients that use manual configuration mode use this parameter in their LE_JOIN_REQUEST frames to specify the LAN type.

If you select manual configuration mode, you must set the emulated LAN type to either IEEE8023 or IEEE8025.

Instructions: Accept the default, Unspecified, if you want the client to obtain the LAN type from the LECS when it joins an emulated LAN. Select IEEE8023 if you want the client to join only Ethernet emulated LANs. Select IEEE8025 if you want the client to join only token ring emulated LANs.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.6

Parameter: MTU

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**

Default: 4608

Options: 0 to 9188

Function: Specifies the MTU, in bytes, that this service record can send. The MTU size is typically determined by the driver. However, this parameter allows you to override the driver default to accommodate connection to devices that require different MTU sizes.

Instructions: Accept the default or enter an MTU size for this service record.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.12

Note: Some ATM devices do not negotiate MTU size. When connecting to such a device, Nortel Networks recommends that you specify an MTU size of 9188 octets for full compatibility with RFC 1577.

Parameter: Service Name

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**

Default: Numeric value assigned by the router.

Options: Any alphanumeric string.

Function: Assigns a unique name to the service record.

Instructions: Accept the service name provided by the router or change the service name to rename the service record.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.15

Parameter: WAN SVC Routing Mode

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes**

Default: Disabled

Options: Disabled | Normal | Dial-Optimized

Function: Assigns a routing mode to the WAN SVC.

Instructions: Accept the default, Disabled, to stop the router from sending RIP updates on this WAN SVC. Select Normal if you plan to have more than one adjacent host per circuit or subnet. Select Dial-Optimized routing if you plan to have only one adjacent host per circuit or subnet.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.2.1.16

ATM Virtual Channel Link Parameters

ATM virtual channel link parameters define PVCs in a PVC service record.

Note: ATM does not allow duplicate VPI/VCI pairs on the same physical interface. However, duplicate VPI/VCI pairs can exist on different physical interfaces.

Parameter: **VPI Number**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC** > **Add**

Default: None

Options: 0 to 255

Function: Identifies the virtual path of the PVC. The VPI is part of the cell header. The header can contain a maximum of 8 VPI bits for a UNI connection. This bit range allows for path identifiers from 0 to 255.

Instructions: Enter a value from 0 to 255.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.3

Parameter: **VCI Number**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC** > **Add**

Default: None

Options: 32 to 65535

Function: Identifies the virtual channel of the PVC. The VCI is part of the cell header. The header can contain a maximum of 16 VCI bits. This bit range allows for path identifiers from 0 to 65535.

Instructions: Enter a value from 32 to 65535.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.4

Note: Following the recommendation of the ATM Forum, virtual channel identifiers from 0 to 31 are reserved for signaling and added functionality.

Parameter: Hybrid/Bridged VC

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: No

Options: Yes | No

Function: Specifies whether the PVC is set to hybrid access mode.

Instructions: Accept the default, No, if you want the PVC to work in group access mode only. Set to Yes if you want the PVC to operate as a hybrid VC.

For more information about the group and hybrid access modes, see “PVC Access Methods” on page 1-17 .

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.25

Parameter: Administrative State

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: Up

Options: Up | Down

Function: Specifies the administrative state of the PVC. The Up state indicates that traffic flow is enabled on this PVC. The Down state indicates that traffic flow is disabled on this PVC.

Instructions: Accept the default, Up, if you want traffic to flow on this PVC. Set the state to Down if you do not want traffic to flow on this PVC.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.5

Parameter: **Xmit Peak Cell Rate (cells/s)**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 2358

Options: 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
128 to 96000 (ATM ARE DS-3 ILI pairs)
128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper traffic limit, in cells/s, that the ATM connection can submit. How you set the peak cell rate depends on:

- The optical transmission rate of your ATM device
- The amount of traffic you expect on a particular VC
- The rate you want for each VC

Instructions: After you determine the transmission rate of your ATM device, set the peak cell rate within the specified range.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.8

Parameter: **Xmit Sustainable Cell Rate (cells/s)**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 2358

Options: 0, 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
0, 128 to 96000 (ATM ARE DS-3 ILI pairs)
0, 128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
0, 128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper limit of the ATM connection conforming average rate. The average rate equals the total number of cells transmitted, divided by the duration of the connection.

Using the sustainable cell rate (SCR), you can define the future cell flow of a VC in greater detail than by using only the peak cell rate.

For ATM ARE ILI pairs and Model 5782 ATM routers, the SCR maps directly to the minimum cell rate (MCR). The MCR defines the minimum amount of guaranteed bandwidth allowed for PVCs and control VCs on the ATM line.

When setting the SCR, keep the following in mind:

- The SCR maps directly to the MCR.
- The MCR provides guaranteed bandwidth for PVCs and control VCs while allowing sufficient bandwidth for SVCs to operate.
- To be useful, the SCR must not exceed the PCR.
- If you know the average rate, set the SCR approximately 10 percent higher than this value.
- VCs may fail to operate with SCR values lower than 128 cells/s.
- Entering 0 for the SCR turns off this function.
- The E-3 framing mode setting affects the maximum SCR.

Instructions: After you determine the transmission rate of your ATM device, set the sustainable cell rate within the specified range. Enter 0 to turn off this function.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.9

Parameter: Xmit Burst Size (cells)

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 40

Options: 1 to 65535

Function: Specifies the maximum number of sequential cells allowed on a VC, at the peak cell rate, before the VC must relinquish bandwidth to other VCs.

When you set the MBS, you should select a value larger than the largest packet your PVC or control VC can transmit (that is, the Maximum AAL CPCS Transmit SDU size). For example, if your VC accepts packets that are less than 2358 bytes long (PVC default), set your MBS value from 45 to 50 cells.

Instructions: Set a value in the specified range.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.10

Parameter: Maximum AAL CPCS Transmit SDU Size

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 4608

Options: 1 to 65535

Function: Specifies the maximum AAL CPCS SDU size, in bytes, that this VC supports in the transmit direction.

Instructions: Enter an octet value that represents the maximum packet size that you intend this VC to transmit. Nortel Networks recommends that you accept the default value of 4608 bytes. Most packets fall well within this limit.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.17

Parameter: Maximum AAL CPCS Receive SDU Size

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 4608

Options: 1 to 65535

Function: Specifies the maximum AAL CPCS SDU size, in bytes, that this VC supports in the receive direction.

Instructions: Enter an octet value that represents the maximum packet size that you intend this VC to receive. Nortel Networks recommends that you accept the default value of 4608 bytes. Most packets fall well within this limit.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.18

Parameter: Data Encapsulation Type

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: LLC/SNAP

Options: LLC/SNAP | NLPID | NULL

Function: Specifies the type of data encapsulation that you want this PVC to use. Select LLC/SNAP, NLPID, or NULL data encapsulation for:

- All PVCs on a service record
- Hybrid PVCs

Instructions: Nortel Networks recommends selecting LLC/SNAP. If you select NULL, the router interprets this as virtual, channel-based multiplexing, which is not supported for bridging.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.19

ATM WAN SVC Parameters

ATM WAN SVC parameters define the traffic shaping options for a particular WAN SVC.

Parameter:	**Enable/Disable**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes > WAN SVC**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables traffic shaping on this WAN SVC.
Instructions:	Accept the default, Enable, if you want the router to use traffic shaping on this WAN SVC. Set to Disable if you do not want the router to use traffic shaping on this WAN SVC.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.2.1.2

Parameter:	**Adjacent Host ATM Address**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes > WAN SVC**
Default:	None
Options:	Any valid ATM address
Function:	Identifies the ATM address of the IP or IPX adjacent host.
Instructions:	Specify the ATM address of the IP or IPX adjacent host.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.2.1.2

Parameter: Xmit Peak Cell Rate (cells/s)

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **WAN SVC**

Default: 4716

Options: 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
128 to 96000 (ATM ARE DS-3 ILI pairs)
128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper traffic limit, in cells/s, that the ATM connection can submit. How you set the peak cell rate depends on:

- The optical transmission rate of your ATM device
- The amount of traffic you expect on a particular VC
- The rate you want for each VC

Instructions: After you determine the transmission rate of your ATM device, set the peak cell rate within the specified range.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.8

Parameter:	**Xmit Sustainable Cell Rate (cells/s)**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **WAN SVC**
Default:	4716
Options:	0, 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers) 0, 128 to 96000 (ATM ARE DS-3 ILI pairs) 0, 128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode) 0, 128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)
Function:	Specifies the upper limit of the ATM connection conforming average rate. The average rate equals the total number of cells transmitted, divided by the duration of the connection. Using the sustainable cell rate (SCR), you can define the future cell flow of a VC in greater detail than by using only the peak cell rate. For ATM ARE ILI pairs and Model 5782 ATM routers, the SCR maps directly to the minimum cell rate (MCR). The MCR defines the minimum amount of guaranteed bandwidth allowed SVCs on the ATM line. When setting the SCR, keep the following in mind: • The SCR maps directly to the MCR. • The MCR allows sufficient bandwidth for SVCs to operate. • To be useful, the SCR must not exceed the PCR. • If you know the average rate, set the SCR approximately 10 percent higher than this value. • VCs may fail to operate with SCR values lower than 128 cells/s. • Entering 0 for the SCR turns off this function. • The E-3 framing mode setting affects the maximum SCR.
Instructions:	After you determine the transmission rate of your ATM device, set the sustainable cell rate within the specified range. Enter 0 to turn off this function.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.5.1.9

Parameter: **Recv Peak Cell Rate (cells/s)**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **WAN SVC**

Default: 4176

Options: 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
128 to 96000 (ATM ARE DS-3 ILI pairs)
128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper traffic limit, in cells/s, that the ATM connection can submit. How you set the peak cell rate depends on:

- The optical receive rate of your ATM device
- The amount of traffic you expect on a particular VC
- The rate you want for each VC

Instructions: After you determine the receive rate of your ATM device, set the peak cell rate within the specified range.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.8

Parameter: **Recv Sustainable Cell Rate (cells/s)**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **WAN SVC**

Default: 4176

Options: 0, 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
0, 128 to 96000 (ATM ARE DS-3 ILI pairs)
0, 128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
0, 128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper limit of the ATM connection conforming average rate. The average rate equals the total number of cells received, divided by the duration of the connection.

Using the sustainable cell rate (SCR), you can define the future cell flow of a VC in greater detail than by using only the peak cell rate.

For ATM ARE ILI pairs and Model 5782 ATM routers, the SCR maps directly to the minimum cell rate (MCR). The MCR defines the minimum amount of guaranteed bandwidth allowed for SVCs on the ATM line.

When setting the SCR, keep the following in mind:

- The SCR maps directly to the MCR.
- The MCR allows sufficient bandwidth for SVCs to operate.
- To be useful, the SCR must not exceed the PCR.
- If you know the average rate, set the SCR approximately 10 percent higher than this value.
- VCs may fail to operate with SCR values lower than 128 cells/s.
- Entering 0 for the SCR turns off this function.
- The E-3 framing mode setting affects the maximum SCR.

Instructions: After you determine the receive rate of your ATM device, set the sustainable cell rate within the specified range. Enter 0 to turn off this function.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.9

LAN Emulation Parameters

LAN emulation parameters define LAN emulation clients in a LANE service record.

Parameter: Enable

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Enable

Options: Enable | Disable

Function: Enables or disables LAN emulation on this service record.

Instructions: Accept the default, Enable, if you want LAN emulation to remain enabled on this service record. Select Disable if you do not want LAN emulation enabled on this service record.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.2

Parameter: Owner

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: None

Options: Leave blank or enter up to 128 alphanumeric characters

Function: Identifies this LAN emulation client. This parameter is optional.

Instructions: Either leave this parameter blank or enter a text string (up to 128 alphanumeric characters) to identify this LAN emulation client.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.4

Parameter: **Configuration Mode**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Automatic

Options: Automatic | Manual

Function: Indicates whether this LAN emulation client configures automatically (that is, uses information from the LECS) or manually (that is, uses information from the LAN Emulation Parameters window).

Instructions: Accept the default, Automatic, if you want this client to configure automatically. Select Manual if you do not want the router to autoconfigure.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.5

Parameter: **Emulated LAN Type**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Unspecified

Options: Unspecified | IEEE8023 | IEEE8025

Function: Specifies the data frame format this client uses when it joins an emulated LAN. Clients that use automatic configuration mode use this parameter in their LE_CONFIGURE_REQUEST frames to specify the LAN type. Clients that use manual configuration mode use this parameter in their LE_JOIN_REQUEST frames to specify the LAN type.

If you select manual configuration mode, you must set the emulated LAN type to either IEEE8023 or IEEE8025.

Instructions: Accept the default, Unspecified, if you want the client to obtain the LAN type from the LAN emulation configuration server (LECS) when it joins an emulated LAN. Select IEEE8023 if you want the client to join only Ethernet emulated LANs. Select IEEE8025 if you want the client to join only token ring emulated LANs.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.6

Parameter: Maximum Data Frame Size

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Unspecified

Options: Unspecified | 1516

Function: Specifies the maximum data frame size (in octets) that this client uses when it joins an emulated LAN. Clients that use automatic configuration mode use this parameter in their LE_CONFIGURE_REQUEST frames. Clients that use manual configuration mode use this parameter in their LE_JOIN_REQUEST frames.

Accept the default, Unspecified, if you want the client to obtain the maximum data frame size when it joins an emulated LAN. Select 1516 if you want to designate the maximum data frame size that this client can:

- Send on the multicast send VCC.
- Receive on the multicast forward VCC.
- Send and receive on data direct VCCs.

Selecting manual configuration mode automatically sets the maximum data frame size to 1516.

Instructions: Accept the default, Unspecified, or select 1516.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.7

Parameter: **Emulated LAN Name**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Default ELAN

Options: Leave blank or enter up to 128 alphanumeric characters

Function: Specifies the name of the emulated LAN that this LE client joins when it joins an emulated LAN. Clients that use automatic configuration mode use this parameter in their LE_CONFIGURE_REQUEST frames. Clients that use manual configuration mode use this parameter in their LE_JOIN_REQUEST frames.

Entering an ELAN name is optional. If you choose not to enter an ELAN name, the LAN emulation configuration server (LECS) assigns the LE client to an ELAN for this domain. However, because some switches do not support a default emulated LAN, Nortel Networks recommends that you assign an ELAN name to the LE client.

Instructions: Either leave this parameter blank or enter an ELAN name (up to 128 alphanumeric characters) that identifies the emulated LAN you want this client to join.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.8

Parameter: **Control Timeout**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 5

Options: 5 to 32767

Function: Specifies the timeout period used for timing out most request/response control frame interactions.

Instructions: Accept the default, 5, or enter a value from 5 to 32767.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.10

Parameter: Max Unknown Frame Count

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 1

Options: 1 to 10

Function: Specifies the maximum number of unknown frames an LE client can send within the interval specified with the Max Unknown Frame Time parameter. A frame is considered unknown when the LE client does not recognize the destination MAC address. In this case, the unknown frame goes to the BUS for distribution.

Instructions: Accept the default, 1, or enter a value from 1 to 10.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.11

Parameter: Max Unknown Frame Time

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 1

Options: 1 to 60

Function: Specifies the maximum amount of time (in seconds) allowed to send the number of unknown frames specified with the Max Unknown Frame Count parameter.

For example, if you use the defaults for these parameters, a LAN emulation client can one unknown frame within 1 second for any given MAC address without having to initiate the Address Resolution Protocol (ARP) to resolve that MAC address.

Instructions: Accept the default, 1, or enter a value from 1 to 60.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.12

Parameter: **VCC Timeout Period Enable**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Enable

Options: Enable | Disable

Function: Disables or reenables the virtual channel connection (VCC) timeout period. When you enable this parameter, a LAN emulation client can release any unused data direct or multicast send VCCs after the VCC timeout period expires. The ATM drivers support a timeout period of 20 minutes.

Instructions: Accept the default, Enable, if you want this LAN emulation client to release unused data direct or multicast send VCCs after the VCC timeout period expires. Select Disable if you do not want this LAN emulation client to release unused data direct or multicast send VCCs after the timeout period expires.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.13

Parameter: **Max Retry Count**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 1

Options: 1 or 2

Function: Specifies the maximum number of times a LAN emulation client can retry an LE_ARP_REQUEST (following the original request) for a given frame MAC address.

Instructions: Accept the default, 1, or enter 2 as the new value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.14

Parameter: Aging Time

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 300

Options: 10 to 300

Function: Specifies the maximum amount of time (in seconds) that a LAN emulation client can maintain an entry in its LAN emulation ARP cache without verifying the relationship of that entry.

Instructions: Accept the default, 300, or enter a value from 10 to 300.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.15

Parameter: Forward Delay Time

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 15

Options: 4 to 30

Function: When there are no changes occurring in the network topology, this parameter specifies the maximum amount of time (in seconds) that a LAN emulation client can maintain an entry in its LAN emulation ARP cache without verifying the relationship of that entry.

Instructions: Accept the default, 15, or enter a value from 4 to 30.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.16

Parameter: Expected LE_ARP Response Time

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 3

Options: 1 to 30

Function: Specifies the amount of time (in seconds) that the LAN emulation client expects an ARP request and ARP response cycle to take. The LAN emulation client uses this value during retries and verifications.

Instructions: Accept the default, 3, or enter a value from 1 to 30.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.1

Parameter:	**Flush Timeout**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**
Default:	4
Options:	1 to 4
Function:	Specifies the amount of time (in seconds) that the LAN emulation client waits to receive a flush response (after sending a flush request) before it takes recovery action by switching to the BUS.
Instructions:	Accept the default, 4, or enter a value from 1 to 4.
MIB Object ID:	1.3.6.1.4.1.18.3.5.9.5.20.1.1.18

Parameter:	**Path Switching Delay**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**
Default:	6
Options:	1 to 8
Function:	Specifies the amount of time (in seconds) that the LAN emulation client waits after sending a frame over an existing VCC before it switches to a new VCC (this applies to multicast and data direct VCCs). You can use this parameter to bypass the flush protocol (that is, when you disable the Flush Protocol parameter, the data for a specific MAC address automatically begins flowing over a new VCC when the path switching delay time elapses).
Instructions:	Accept the default, 6, or enter a value from 1 to 8.
MIB Object ID:	1.3.6.1.4.1.18.3.5.9.5.20.1.1.19

Parameter: Emulated LAN Segment ID

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: 0

Options: 0 to 4095

Function: Specifies the ring ID (in decimal) on which this token ring client resides. You need only set this parameter for IEEE 802.5 LANE clients that are:

- Token ring end stations
- Routing IP or IPX across an SRB token ring network

Instructions: Accept the default, 0, or enter a value from 0 to 4095.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.20

Parameter: Flush Protocol

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Enable

Options: Enable | Disable

Function: Enables or disables the flush protocol on this LE client.

The flush protocol ensures that data destined for a particular MAC address arrives in sequence. Following a flush request, the flush protocol drops cells for this MAC address while waiting for:

- The flush response from that MAC address
- The flush timeout to expire for that MAC address

If the client receives a flush response for the MAC address, the cells for this MAC address begin flowing over a new virtual circuit. However, if the flush timeout expires for this MAC address, the cells begin flowing to the BUS.

When disabled, cells containing the same MAC address are dropped while waiting for the Path Switching Delay parameter to time out. After the path switching delay time elapses, the data automatically begins flowing over a new virtual circuit.

Instructions: Accept the default, Enable, if you want the flush protocol to operate on this LAN emulation client. Select Disable if you do not want the flush protocol to operate on this LAN emulation client.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.25

Parameter: LE Config Server ATM Address

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: None

Options: Any valid LAN emulation configuration server (LECS) ATM address

Function: Specifies the LECS ATM address. Entering an address for this parameter is optional. If you do not enter an address, the LE client uses the well-known LECS ATM address to open a configuration VCC to the configuration service.

Instructions: Leave blank or enter the ATM address of the LECS.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.30

Parameter: LAN Emulation Version 2

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC**

Default: Disable

Options: Enable | Disable

Function: Enables and disables LAN emulation Version 2.

Instructions: Accept the default, Disable, if this LAN emulation client operates in a standard LAN emulation network. Select Enable if you want this LAN emulation client to operate in an MPOA network.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.1.1.30

LES Parameters

LAN emulation server (LES) parameters define LAN emulation servers for LANE clients.

Parameter:	**Enable**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC** > **LES**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables the chosen LAN emulation server (LES) on this service record.
Instructions:	Accept the default, Enable, if you want the LAN emulation client to use this LES address in the specified order of preference. Select Disable if you do not want the LAN emulation client to consider this LES address.
MIB Object ID:	1.3.6.1.4.1.18.3.5.9.5.20.10.1.2

Parameter:	**LE Server ATM Address Network Prefix**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC** > **LES**
Default:	39000000000000000000000000
Options:	*XX*000000000000000000000000 to *XX*FFFFFFFFFFFFFFFFFFFFFFFF where *XX* = 39, 45, or 47
Function:	Specifies the network prefix of the ATM address for this LAN emulation server (LES). The network prefix specifies the ATM domain of which this LES is a part. The *XX* byte must be 39, 45, or 47. This value defines the authority and format identifier (AFI). The AFI byte identifies the group responsible for allocating the prefix and the format the prefix uses. For more information about the AFI byte, see the ATM Forum UNI specification.
Instructions:	Accept the default network prefix, or if the LES resides in a different ATM domain, enter the network prefix for that domain.
MIB Object ID:	1.3.6.1.4.1.18.3.5.9.5.20.10.1.5

Parameter: LE Server ATM Address User Part

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC** > **LES**

Default: None

Options: 00000000000000 to FFFFFFFFFFFFFF

Function: Specifies the user part (suffix) of the ATM address for a LAN emulation server (LES) on your network. The user part suffix consists of a 6-byte end-station identifier and a 1-byte selector field.

The user part and the network prefix form a complete ATM address.

Instructions: Enter the ATM address user part of the LES.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.10.1.5

Parameter: LE Server Name

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **LEC** > **LES**

Default: Numeric value assigned by the router.

Options: Any alphanumeric string.

Function: Assigns a unique name to the LAN emulation server (LES).

Instructions: Accept the LES name provide by the router or change the name to rename the server.

MIB Object ID: 1.3.6.1.4.1.18.3.5.9.5.20.10.1.6

ATM Signaling Parameters

ATM signaling parameters define the connection and timer limits the router uses to set up, maintain, and clear a switched connection.

The ATM Signaling Parameters window also provides access to the signaling VC parameters. The signaling VC provides a dedicated VPI (0) and VCI (5) for ATM signaling functions.

For control VC parameter descriptions, see “Signaling and ILMI Control VC Parameters” on A-68.

Parameter:	**Enable**
Path:	Configuration Manager > Protocols > ATM > ATM Signaling and Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables ATM signaling on this interface. When you disable signaling on the interface, the ATM Service Record Parameters window automatically sets the Data Encapsulation Type parameter to LLC/SNAP and the Virtual Connection Type parameter to PVC.
Instructions:	Accept the default, Enable, if you want signaling to remain enabled on this interface. Set to Disable if you do not want signaling enabled on this interface.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.7.1.2

Parameter: **Protocol Standard**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: UNI_V30

Options: UNI_V30 | UNI_V31 | UNI_V40

Function: Specifies how the interface defines Service Specific Connection Oriented Protocol (SSCOP) frames. Version 3.0, Version 3.1, and Version 4.0 SSCOP frames are incompatible.

Instructions: You must assign the same protocol standard for both the router interface and the switch. Accept the default, UNI_V30, if the switch uses UNI Version 3.0 to define SSCOP frames. Select UNI_V31 if the switch uses UNI Version 3.1 to define SSCOP frames. Select UNI_V40 if the switch uses UNI Version 4.0 to define SSCOP frames.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.15

Parameter: **Max Number of SVC Applications**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 20

Options: 1 to 32767

Function: Specifies the maximum number of SVC applications allowed for this circuit. The number of SVC applications corresponds to the number of LAN emulation or IP (RFC 1577) clients allowed for the circuit.

Instructions: Accept the default, 20, or enter a value from 1 to 32767.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.6

Parameter: Max Point to Point Connections

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 1000

Options: 0 to 32767

Function: Specifies the maximum number of simultaneous point-to-point connections allowed for this circuit.

Instructions: Accept the default, 1000, or enter a value from 0 to 32767.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.7

Parameter: Max Point to Multipoint Connections

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 40

Options: 0 to 32767

Function: Specifies the maximum number of simultaneous point-to-multipoint connections allowed for this circuit.

Instructions: Accept the default, 40, or enter a value from 0 to 32767.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.8

Parameter:	**Max Parties in Multipoint Connections**
Path:	Configuration Manager > Protocols > ATM > ATM Signaling
	and
	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**
Default:	1
Options:	0 to 32767
Function:	Specifies the maximum number of simultaneous parties in a point-to-multipoint connection allowed for this circuit.
Instructions:	Accept the default, 1, or enter a value from 0 to 32767.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.7.1.9

Parameter:	**Min Memory Threshold**
Path:	Configuration Manager > Protocols > ATM > ATM Signaling
	and
	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**
Default:	20%
Options:	10% | 20% | 30% | 40% | 50% | 60% | 70% | 80% | 90% | 100%
Function:	Specifies the minimum percentage of buffer memory necessary to enable a new call.
Instructions:	Accept the default, 20%, or select another percentage.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.7.1.11

Parameter:	**VPI**
Path:	Configuration Manager > Protocols > ATM > ATM Signaling and Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**
Default:	0
Options:	0 to 255
Function:	Specifies the virtual path identifier (VPI) for the signaling VC. The signaling VC is a dedicated VPI/VCI pair reserved for signaling messages.
Instructions:	Accept the default value, 0, or enter a value from 0 to 255.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.7.1.13

Caution: The signaling VC (0/5) and the ILMI VC (0/16) are reserved. These VCs remain in an operational state as long as signaling is enabled on the ATM interface. Because most ATM devices use these VPI/VCI pairs for signaling, Nortel Networks recommends that you not change these values.

Parameter: **VCI**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 5

Options: 1 to 65535

Function: Specifies the virtual channel identifier (VCI) for the signaling VC. The signaling VC is a dedicated VPI/VCI pair reserved for signaling messages.

Instructions: Accept the default, 5, or enter a value from 1 to 65535.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.14

Caution: The signaling VC (0/5) and the ILMI VC (0/16) are reserved. These VCs remain in an operational state as long as signaling is enabled on the ATM interface. Because most ATM devices use these VPI/VCI pairs for signaling, Nortel Networks recommends that you not change these values.

Parameter: T301

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 180

Options: 180 to 1024

Function: Specifies the Alert Received timer value (in seconds). This timer begins when the circuit initiates a call/connection request by receiving an ALERT message over the signaling VC.

The Alert Received timer stops when the circuit receives a CONNECT message (indicating connection) from the network.

If the circuit does not receive a CONNECT message within the allotted time, it clears the connection.

This timer can be used with UNI Version 4.0 and later.

Instructions: Accept the default, 180, or enter a value from 180 to 1024.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.41

Parameter: **T303**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 4

Options: 1 to 24

Function: Specifies the Setup Sent timer value (in seconds). This timer begins when the circuit initiates a call/connection request by sending a SETUP message over the signaling VC.

The Setup Sent timer stops when the circuit receives a CONNECT message (indicating connection), a CALL PROCEEDING message (indicating that the network received the SETUP message), or a RELEASE COMPLETE message (indicating the rejection of the SETUP message) from the network.

If the circuit does not receive one of these messages within the allotted time, it transmits the SETUP message again. If the circuit still does not receive a response, it clears the connection.

Instructions: Accept the default, 4, or enter a value from 1 to 24.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.25

Parameter: T304

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 30

Options: 30 to 120

Function: Specifies the Setup Acknowledgement timer value (in seconds). This timer begins when the circuit initiates a call/connection request by sending a SETUP ACK message over the signaling VC.

The Setup Acknowledgement timer stops when the circuit receives a CONNECT message (indicating connection), a CALL PROCEEDING message (indicating that the network received the SETUP message), or an ALERT from the network.

If the circuit does not receive one of these messages within the allotted time, it clears the connection.

This timer can be used with UNI Version 4.0 and later.

Instructions: Accept the default, 30, or enter a value from 30 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.42

Parameter: **T308**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 30

Options: 1 to 180

Function: Specifies the Release Sent timer value (in seconds). This timer begins when the circuit sends a RELEASE message to initiate clearing of an SVC. Sending a RELEASE message places the network in the release request state.

The Release Sent timer stops when the circuit receives either a RELEASE message (that is, both the circuit and the network sent RELEASE messages at the same time) or a RELEASE COMPLETE message from the network.

If the timer expires before the circuit receives one of these messages, the circuit transmits the RELEASE message again. If the circuit still does not receive a response, the circuit releases the call reference and begins a restart procedure.

Instructions: Accept the default, 30, or enter a value from 1 to 180.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.26

Parameter: T309

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 10

Options: 1 to 540

Function: Specifies the SAAL Data Link Connect timer value (in seconds). This timer begins when a signaling AAL malfunction occurs.

The SAAL Data Link Connect timer stops when the circuit reestablishes SAAL (that is, when the circuit sends an AAL-ESTABLISH-REQUEST and receives an AAL-ESTABLISH-CONFIRM message).

If the timer expires before the circuit can reestablish SAAL, the circuit clears the connection.

Instructions: Accept the default, 10, or enter a value from 1 to 540.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.27

Parameter: T310

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 10

Options: 1 to 60

Function: Specifies the Call Proceeding Received timer value (in seconds). This timer begins when the circuit receives a CALL PROCEEDING message from the network.

If the router does not receive a CONNECT or RELEASE message before this timer expires, it clears the connection for that virtual circuit.

Instructions: Accept the default, 10, or enter a value from 1 to 60.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.28

Parameter: **T313**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 4

Options: 1 to 24

Function: Specifies the Connect Sent timer value (in seconds). This timer begins when the circuit sends a CONNECT message to the network.

The Connect Sent timer stops when the circuit receives a CONNECT ACKNOWLEDGE message from the network (indicating the completion of the ATM connection for that interface).

If the timer expires before the circuit receives a CONNECT ACKNOWLEDGE message, the circuit clears the connection.

Instructions: Accept the default, 4, or enter a value from 1 to 24.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.29

Parameter: **T316**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 120

Options: 1 to 720

Function: Specifies the Restart Request Sent on Interface timer value (in seconds). This timer begins when the circuit sends a RESTART message to the network. The circuit uses the RESTART message to return all VCs on the interface to the idle condition.

The Restart Request Sent on Interface timer stops when the circuit receives a RESTART ACKNOWLEDGE message from the network.

If the timer expires before the circuit receives a RESTART ACKNOWLEDGE message, the circuit can transmit as many RESTART messages as specified with the Num Restarts ReXmitted parameter (see the parameter description on A-62). If the circuit still does not receive a response, the circuit enters the null state until the appropriate maintenance action is taken.

Instructions: Accept the default, 120, or enter a value from 1 to 720.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.30

Parameter: **T316c**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 120

Options: 1 to 720

Function: Specifies the Restart Request Sent on Channel timer value (in seconds). This timer begins when the circuit sends a RESTART message to the network. The circuit uses the RESTART message to return this individual VC on the interface to the idle condition.

The Restart Request Sent on Channel timer stops when the circuit receives a RESTART ACKNOWLEDGE message from the network.

If the timer expires before the circuit receives a RESTART ACKNOWLEDGE message, the circuit can transmit as many RESTART messages as specified with the Num Restarts ReXmitted parameter (see the parameter description on A-62). If the circuit still does not receive a response, the circuit enters the null state until the appropriate maintenance action is taken.

Instructions: Accept the default, 120, or enter a value from 1 to 720.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.31

Parameter: **T322**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 4

Options: 1 to 24

Function: Specifies the Status Enquiry Sent timer value (in seconds). This timer begins when the circuit sends a STATUS ENQUIRY message to the network. This message checks the validity of a call by requesting the call state (that is, active, in progress, or null). The Status Enquiry Sent timer stops when the circuit receives a STATUS message from the network.

If the timer expires before the circuit receives a STATUS message, the circuit can transmit as many STATUS ENQUIRY messages as specified with the Num Stat Enquiries ReXmitted parameter (see the parameter description on A-63). If the circuit still does not receive a response, the circuit clears the call.

Instructions: Accept the default, 4, or enter a value from 1 to 24.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.32

Parameter: **TDisc**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 4

Options: 1 to 180

Function: Specifies the SAAL Data Link Disconnect timer value (in seconds). This internal timer alerts upper layers that the link is down. The timer begins if the entire link goes down for any reason.

When the link goes down, the SAAL sends a DISCONNECT REQUEST message to the upper-layer application manager. The SAAL sends a disconnect request every time the SAAL Data Link Disconnect timer expires and continues to send this message until the link becomes operational.

Instructions: Accept the default, 4, or enter a value from 1 to 180.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.33

Parameter: T397

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 180

Options: 180 to 1024

Function: Specifies the Alerting Received timer value (in seconds). This timer begins when the circuit sends an ALERTING or ADD PARTY ALERTING message to a party (the receiver of the message) on the network.

The Alerting Received timer stops when the circuit receives a DROP PARTY ACKNOWLEDGE message (indicating that the end point used for the party has been released) or a RELEASE message (indicating that the end point used for the party has been released and there are no remaining parties).

This timer can be used with UNI Version 4.0 and later.

Instructions: Accept the default, 180, or enter a value from 180 to 1024.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.43

Parameter: **T398**

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 4

Options: 1 to 24

Function: Specifies the Drop Party Sent timer value (in seconds). This timer applies to multipoint connections only and begins when the circuit sends a DROP PARTY message to a party (the receiver of the message) on the network.

The Drop Party Sent timer stops when the circuit receives a DROP PARTY ACKNOWLEDGE message (indicating that the end point used for the party has been released) or a RELEASE message (indicating that the end point used for the party has been released and there are no remaining parties).

Instructions: Accept the default, 4, or enter a value from 1 to 24.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.34

Parameter: T399

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 14

Options: 1 to 84

Function: Specifies the Add Party Sent timer value (in seconds). This timer applies to multipoint connections only and begins when the circuit sends an ADD PARTY message to a party (the receiver of the message) on the network.

The Add Party Sent timer stops when the circuit receives an ADD PARTY ACKNOWLEDGE message (indicating the connection to the party), an ADD PARTY REJECT message (indicating the inability to add the party), or a RELEASE message (indicating the inability to add the party and the absence of any remaining parties).

If the timer expires before the circuit receives an ADD PARTY ACKNOWLEDGE, ADD PARTY REJECT, or RELEASE message, the circuit clears the party.

Instructions: Accept the default, 14, or enter a value from 1 to 84.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.35

Parameter: Num Restarts ReXmitted

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 3

Options: 1 to 100

Function: Specifies the number of RESTART messages retransmitted before the link is considered down.

Instructions: Accept the default, 3, or enter a value from 1 to 100.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.36

Parameter: Num Stat Enquiries ReXmitted

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 3

Options: 1 to 100

Function: Specifies the number of STATUS ENQUIRY messages retransmitted before the link is considered down.

Instructions: Accept the default, 3, or enter a value from 1 to 100.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.37

Parameter: Num Messages/Sec for Call Pacing

Path: Configuration Manager > Protocols > ATM > ATM Signaling

and

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **ATM Signaling**

Default: 0

Options: 0 to 2147483647

Function: Specifies the maximum number of signaling messages the interface can transmit per second. The default value, 0, turns off this feature.

Instructions: Accept the default value, 0, or enter a value from 1 to 2147483647.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.7.1.40

ATM ILMI Signaling Parameters

ILMI signaling parameters define the SNMP timers and retry limits for registration with the ATM switch. For control VC parameter descriptions, see "Signaling and ILMI Control VC Parameters" on A-68.

Parameter:	**Enable**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**
Default:	Enable
Options:	Enable | Disable
Function:	Enables or disables ILMI on this interface.
Instructions:	Accept the default, Enable, if you want ILMI to remain enabled on this interface. Select Disable if you do not want ILMI enabled on this interface.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.9.1.2

Parameter:	**ILMI VPI**
Path:	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**
Default:	0
Options:	0 to 255
Function:	Specifies the virtual path identifier (VPI) for the ILMI VC.
Instructions:	Accept the default, 0, or enter a value from 0 to 255.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.9.1.8

Caution: The signaling VC (0/5) and the ILMI VC (0/16) are reserved. These VCs remain in an operational state as long as signaling is enabled on the ATM interface. Because most ATM devices use these VPI/VCI pairs for signaling, Nortel Networks recommends that you not change these values.

Parameter: **ILMI VCI**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 16

Options: 1 to 65535

Function: Specifies the virtual channel identifier (VCI) for the ILMI VC.

Instructions: Accept the default, 16, or enter a value from 1 to 65535.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.9

Caution: The signaling VC (0/5) and the ILMI VC (0/16) are reserved. These VCs remain in an operational state as long as signaling is enabled on the ATM interface. Because most ATM devices use these VPI/VCI pairs for signaling, Nortel Networks recommends that you not change these values.

Parameter: **ILMI Get Timer**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 3

Options: 1 to 120

Function: Specifies the ILMI Get Request timer value (in seconds). The Get Request timer sets the amount of time allowed to receive a GET_RESPONSE message after sending a GET_REQUEST message.

Instructions: Accept the default, 3, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.13

Parameter: ILMI Get Retry Count

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 3

Options: 1 to 100

Function: Specifies the number of retransmissions of the ILMI GET_REQUEST message before the link is considered down.

Instructions: Accept the default, 3, or enter a value from 1 to 100.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.14

Parameter: ILMI Get Next Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 3

Options: 1 to 120

Function: Specifies the ILMI Get Next Request timer value (in seconds). The Get Next Request timer sets the amount of time allowed to receive a GET_NEXT_RESPONSE message after sending a GET_NEXT_REQUEST message.

Instructions: Accept the default, 3, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.15

Parameter: ILMI Get Next Retry Count

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 3

Options: 1 to 100

Function: Specifies the number of retransmissions of the ILMI GET_NEXT_REQUEST message before the link is considered down.

Instructions: Accept the default, 3, or enter a value from 1 to 100.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.16

Parameter: ILMI Set Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 3

Options: 1 to 120

Function: Specifies the ILMI Set Request timer value (in seconds). The Set Request timer sets the amount of time allowed to receive a SET_RESPONSE message after sending a SET_REQUEST message.

Instructions: Accept the default, 3, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.17

Parameter: ILMI Set Retry Count

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)**

Default: 3

Options: 1 to 100

Function: Specifies the number of retransmissions of the ILMI SET_REQUEST message before the link is considered down.

Instructions: Accept the default, 3, or enter a value from 1 to 100.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.9.1.18

Signaling and ILMI Control VC Parameters

The parameters for signaling and ILMI control VCs are identical.

Parameter: Xmit Peak Cell Rate (cells/s)

Path: Configuration Manager > Protocols > ATM > ATM Signaling > **Sig VC**

or

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)** > **ILMI VC**

Default: 4716

Options: 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
128 to 96000 (ATM ARE DS-3 ILI pairs)
128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper traffic limit, in cells/s, that the ATM connection can support. How you set the peak cell rate depends on:

- The optical transmission rate of your ATM device
- The amount of traffic you expect on a particular VC
- The rate you want for each VC

Instructions: After you determine the transmission rate of your ATM device, set the peak cell rate within the specified range.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.8

Parameter: **Xmit Sustainable Cell Rate (cells/s)**

Path: Configuration Manager > Protocols > ATM > ATM Signaling > **Sig VC**

or

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)** > **ILMI VC**

Default: 4716

Options: 0, 128 to 353207 (ATM ARE OC-3 SONET/SDH ILI pairs and Model 5782 ATM routers)
0, 128 to 96000 (ATM ARE DS-3 ILI pairs)
0, 128 to 80000 (ATM ARE E-3 ILI pairs; G.832 framing mode)
0, 128 to 72000 (ATM ARE E-3 ILI pairs; G.751 framing mode)

Function: Specifies the upper limit of the ATM connection conforming average rate. The average rate equals the total number of cells transmitted, divided by the duration of the connection.

Using the sustainable cell rate (SCR), you can define the future cell flow of a VC in greater detail than by using only the peak cell rate.

The SCR maps directly to the minimum cell rate (MCR). The MCR defines the minimum amount of guaranteed bandwidth allowed for PVCs and control VCs on the ATM line.

When setting the SCR, keep the following in mind:

- The SCR maps directly to the MCR.
- The MCR provides guaranteed bandwidth for PVCs and control VCs while allowing sufficient bandwidth for SVCs to operate.
- To be useful, the SCR must not exceed the PCR.
- If you know the average rate, set the SCR approximately 10 percent higher than this value.
- VCs may fail to operate with SCR values lower than 128 cells/s.
- Entering 0 for the SCR turns off this function.
- The E-3 framing mode setting affects the maximum SCR.

Instructions: After you determine the transmission rate of your ATM device, set the sustainable cell rate within the specified range. Enter 0 to turn off this function.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.9

Parameter:	**Xmit Burst Size (cells)**
Path:	Configuration Manager > Protocols > ATM > ATM Signaling > **Sig VC**
	or
	Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)** > **ILMI VC**
Default:	40
Options:	1 to 65535
Function:	Specifies the maximum number of sequential cells allowed on a VC, at the peak cell rate, before the VC must relinquish bandwidth to other VCs.
	When setting the MBS, you should select a value larger than the largest packet that your control VC can transmit (that is, the Maximum AAL CPCS Transmit SDU Size). For example, if your VC accepts packets that are less than 2358 bytes long (PVC default), set your MBS value from 45 to 50 cells.
Instructions:	Set a value in the specified range.
MIB Object ID:	1.3.6.1.4.1.18.3.4.23.1.5.1.10

Parameter: **Maximum AAL CPCS Transmit SDU Size**

Path: Configuration Manager > Protocols > ATM > ATM Signaling > **Sig VC**

or

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)** > **ILMI VC**

Default: 4608

Options: 1 to 65535

Function: Specifies the maximum AAL CPCS SDU size, in bytes, that this VC supports in the transmit direction.

Instructions: Enter the maximum packet size that you intend this VC to transmit. Nortel Networks recommends that you accept the default value of 4608 bytes. Most packets fall well within this limit.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.17

Parameter: **Maximum AAL CPCS Receive SDU Size**

Path: Configuration Manager > Protocols > ATM > ATM Signaling > **Sig VC**

or

Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Interim Local Management Interface (ILMI)** > **ILMI VC**

Default: 4608

Options: 1 to 65535

Function: Specifies the maximum AAL CPCS SDU size, in bytes, that this VC supports in the receive direction.

Instructions: Enter the maximum packet size that you intend this VC to receive. Nortel Networks recommends that you accept the default value of 4608 bytes. Most packets fall well within this limit.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.18

ATM Signaling AAL Parameters

Signaling AAL (SAAL) parameters define the connection and timer settings the router uses to maintain a switched connection. SAAL provides reliable transport of signaling messages within the ATM protocol reference model.

Parameter: **Enable**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: Enable

Options: Enable | Disable

Function: Enables or disables SAAL on this interface.

Instructions: Accept the default, Enable, if you want SAAL to remain enabled on this interface. Select Disable if you do not want SAAL enabled on this interface.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.2

Parameter: **Link Connection Arbitration**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: Active

Options: Active | Passive

Function: Determines whether SAAL initiates link connections or waits for connections.

Instructions: Accept the default, Active, if you want this interface to initiate connections. Select Passive if you do not want this interface to initiate connections.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.8

Parameter: Poll Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 7

Options: 1 to 120

Function: Specifies the Service Specific Connection Oriented Protocol (SSCOP) poll timer value (in tenths of a second). This value sets the allowable time between poll protocol data unit (PDU) transmissions.

The poll timer ensures that the receiver continues to return a solicited status (STAT) PDU to the sender on a regular basis. The timely receipt of STAT PDUs restarts the poll timer and allows for more efficient transmission error recovery.

Instructions: Accept the default, 7, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.9

Parameter: Keep Alive Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 20

Options: 1 to 120

Function: Specifies the SSCOP keepalive timer value (in tenths of a second). This value sets the allowable time between poll PDU transmissions if there are no pending sequence data (SD) PDUs.

The keepalive timer is generally greater than the poll timer and greater than the length of one round-trip delay.

Instructions: Accept the default, 20, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.10

Parameter: No Response Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 70

Options: 1 to 120

Function: Specifies the SSCOP no response timer value (in tenths of a second). This value sets the allowable time between the receipt of STAT PDUs.

So as not to interrupt the flow of data, SSCOP does not require a reply to every poll PDU. This can cause problems in detecting a failed connection. To alleviate this problem, the no response timer runs parallel to the poll timer. If both the no response timer and the poll timer expire, SSCOP clears the connection.

The no response timer value must equal at least the sum of the keepalive timer plus the length of one round-trip delay.

Instructions: Accept the default, 70, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.11

Parameter: Connection Control Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 10

Options: 1 to 120

Function: Specifies the SSCOP connection control (CC) timer value (in tenths of a second). This value sets the allowable time between the transmission of begin (BGN), END, resynchronization (RS), and error recovery (ER) PDUs, so long as the sender has not received an acknowledgment to any of these PDUs.

The CC timer must equal at least the length of one round-trip delay.

Instructions: Accept the default, 10, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.12

Parameter: Max Connection Control

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 4

Options: 1 to 20

Function: Specifies the SSCOP maximum connection control value. This value sets the maximum number of times the sender can transmit a BGN, END, RS, or ER PDU.

Instructions: Accept the default, 4, or enter a value from 1 to 20.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.13

Parameter: Max PD Before Poll

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 25

Options: 1 to 120

Function: Specifies the SSCOP maximum poll data (PD) value. This value sets the maximum value of the poll data state variable before transmitting a poll PDU. The poll data state variable increments upon transmission of a sequenced data (SD) PDU and resets to 0 upon transmission of a poll PDU.

Instructions: Accept the default, 25, or enter a value from 1 to 120.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.14

Parameter: Max STAT PDU Elements

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Signaling AAL (SAAL)**

Default: 67

Options: Odd integer from 3 to 119

Function: Specifies the SSCOP maximum STAT PDU value. This value sets the maximum number of list elements allowed in a STAT PDU.

The sending device uses the value of this parameter for segmentation purposes. When the number of list elements exceeds this value, the STAT message segments. As a general rule, the default value, 67, causes the STAT PDU to fill six ATM cells using AAL 5.

Instructions: Accept the default, 67, or enter an odd integer from 3 to 119.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.8.1.15

ATM Router Redundancy Parameter

This section describes the ATM Monitoring Timer parameter for implementing ATM router redundancy. For information about all other router redundancy parameters, see *Configuring Interface and Router Redundancy.*

Parameter: ATM Monitoring Timer

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Configure ATM Router Redundancy**

Default: 3000

Options: 1 to 65535

Function: Specifies the amount of time in milliseconds (ms) that the secondary router waits before beginning the process of becoming the primary router. By default, if the router experiences a loss of signal, it waits 3000 ms for the signal to return. If the signal does not return within that time, the secondary router begins the process of becoming the primary router.

Instructions: Accept the default, 3000, or enter another value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.17.1.34

OAM Parameters

This section describes ATM PVC Operations and Management (OAM) parameters.

Parameter: OAM Loopback Enable

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: Disable

Options: Enable | Disable

Function: Specifies whether or not the ATM PVC sends OAM loopback cells.

Instructions: Select Enable if you want the ATM PVC to send OAM loopback cells. Select Disable if you do not want the ATM PVC to send OAM loopback cells.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.31

Note: You must configure OAM loopback on all PVCs on a service record for the feature to function properly. Service record status is based on the OAM loopback status of all PVCs on the service record.

Parameter: OAM Loopback Cell Interval

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 5

Options: 1 to 255 seconds

Function: Specifies the OAM loopback cell interval in seconds. This value specifies how often an ATM PVC sends an OAM loopback cell in the data stream.

Instructions: Specify an interval from 1 to 255 seconds.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.32

Parameter: **OAM Threshold 1**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 1

Options: 1 to 255

Function: Specifies the number of cells that the PVC can lose after not receiving an OAM loopback response before declaring that the PVC service record is not operational.

Instructions: Specify a threshold value from 1 to 255 cells.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.33

Parameter: **OAM Threshold 2**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: 2

Options: 1 to 255

Function: Specifies the number of OAM loopback response cells that the PVC service record must receive before declaring that the PVC is operational again.

Instructions: Specify a threshold value from 1 to 255 cells.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.34

Parameter: **OAM Alarm Enable**

Path: Configuration Manager > Circuits > Edit Circuits > **Edit** > **ATM** > **Service Attributes** > **PVC**

Default: Disable

Options: Enable | Disable

Function: When enabled, this parameter tells the upper-layer protocol that the PVC has received an OAM alarm and that the service record is down. When disabled, OAM alarms are ignored and no message is sent to the upper-layer protocol.

Instructions: Select Enable if the connecting switch has OAM alarm capability, and if you want the ATM PVC to notify the upper-layer protocol of any OAM alarms. Select Disable if the connecting switch does not have OAM alarm capability, or if you do not want the ATM PVC to notify the upper-layer protocol of any OAM alarms.

MIB Object ID: 1.3.6.1.4.1.18.3.4.23.1.5.1.35

ATMARP Parameters

This section describes ATM-specific IP parameters for implementing classical IP over ATM. For additional information about ATMARP, see *Configuring IP, ARP, RIP, and OSPF Services.*

Parameter:	**ATM ARP Mode**
Path:	Configuration Manager > Protocols > IP > Interfaces
Default:	Client
Options:	Client | Server | None
Function:	Specifies whether ATMARP is running as a client or server on this interface.
Instructions:	You must configure one ATMARP server for each LIS you define. When configuring a WAN SVC, select None.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.2.1.4.1.112

Parameter:	**ARP Server ATM Address Network Prefix**
Path:	Configuration Manager > Protocols > IP > Interfaces
Default:	None
Options:	*XX*00000000000000000000000 to *XX*FFFFFFFFFFFFFFFFFFFFFFFF where *XX* = 39, 45, or 47
Function:	Specifies the ATM address network prefix of the ATMARP server on your network. The network prefix and the user part form a complete ATM address. The *XX* byte must contain 39, 45, or 47. These values define the authority and format identifier (AFI). The AFI byte identifies the group responsible for allocating the prefix and the format the prefix uses. For more information about the AFI byte, see the ATM Forum UNI specification.
Instructions:	Enter the ATM address network prefix of the ATMARP server on your network.
MIB Object ID:	1.3.6.1.4.1.18.3.5.3.2.1.4.1.113

Parameter: ARP Server ATM Address User Part

Path: Configuration Manager > Protocols > IP > Interfaces

Default: None

Options: 00000000000000 to FEFFFFFFFFFFFF

Function: Specifies the user part (suffix) of the ATM address for the ATMARP server on your network. The user part suffix consists of a 6-byte end-station identifier and a 1-byte selector field. The user part and the network prefix form a complete ATM address.

Instructions: Enter the ATM address user part of the ATMARP server for your network.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.4.1.113

Parameter: Registration Refresh Interval

Path: Configuration Manager > Protocols > IP > Interfaces

Default: 900 seconds for a client
1200 seconds for a server

Options: Any interval (in seconds)

Function: For a client, this parameter specifies the interval between registration refreshes. For a server, this parameter specifies the duration for which the registration is valid.

Instructions: Determine whether ATMARP is running as a client or server on this interface and enter an appropriate value.

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.4.1.115

Adjacent Host Parameters

This section describes ATM IP parameters for creating adjacent hosts in a classical IP over ATM environment. For additional information about adjacent hosts, see *Configuring IP, ARP, RARP, RIP, and OSPF Services.*

Parameter: Enable

Path: Configuration Manager > Protocols > IP > Adjacent Hosts
Default: Enable
Options: Enable | Disable
Function: Specifies the state (active or inactive) of the adjacent host in the IP routing table.
Instructions: Select Disable to make the adjacent host record inactive in the IP routing table; the IP router will not consider this adjacent host.

Select Enable to make the adjacent host record active again in the IP routing table.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.6.1.2

Parameter: IP Adjacent Host Address

Path: Configuration Manager > Protocols > IP > Adjacent Hosts
Default: None
Options: Any valid IP address
Function: Specifies the IP address of the device that you want to configure as an adjacent host.
Instructions: Enter the IP address in dotted-decimal notation.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.6.1.3

Parameter: Next Hop Interface Addr

Path: Configuration Manager > Protocols > IP > Adjacent Hosts
Default: 0.0.0.0
Options: Any valid IP address
Function: Specifies the IP address of the router’s network interface to the adjacent host.
Instructions: Enter the IP address in dotted-decimal notation.
MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.6.1.4

Parameter: MAC Address

Path: Configuration Manager > Protocols > IP > Adjacent Hosts

Default: None

Options: Depend on the data link you selected

Function: Specifies the MAC address of the adjacent host. This value can be any of the following:

- A 48-bit physical address
- A 64-bit SMDS address
- An ATM VPI/VCI pair (for ATM PVCs)
- The ATM address of the ATM interface (for ATM SVCs)

Instructions: Enter the MAC address as a 12-digit hexadecimal number (canonical format), a 32-digit hexadecimal number (SMDS), a VPI/VCI pair *(*for example, 0/32), or a 40-digit ATM address (for example, 390000000000000000000000000000A20037B801).

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.6.1.6

Parameter: Host Encapsulation

Path: Configuration Manager > Protocols > IP > Adjacent Hosts

Default: Ethernet

Options: Ethernet | SNAP | PDN | DDN | SNAPIP | NULL

Function: Specifies the adjacent host's encapsulation method.

Instructions: Select Ethernet or SNAP if you are defining a point-to-point network interface, or if the adjacent host resides on an Ethernet. For an X.25 interface, select Public Data Network (PDN) or Defense Data Network (DDN). For an adjacent host on an ATM logical IP subnet, select SNAP. (SNAPIP and NULL also specify host encapsulation methods for ATM networks.)

MIB Object ID: 1.3.6.1.4.1.18.3.5.3.2.1.6.1.7

Appendix B
Monitoring ATM Using the BCC show Command

This appendix describes how to use the BCC **show** command to obtain ATM, LANE, and classical IP statistical data from the management information base (MIB). The type and amount of data displayed depend on the specific ATM settings that you want to view. This appendix includes descriptions of the following **show** commands:

(continued)

show atm interfaces

The **show atm interfaces** command displays the ATM interface table. This table contains information about all ATM interfaces on the router or specific information based on the filters you use.

This command allows for the following command filters (flags) and filter arguments:

-slot *<slot>*[/*<connector>*]	Displays information about the specified slot or slot/connector pair only.
-**enabled**	Displays information for only those interfaces enabled on the router or on the specified slot or slot/connector pair.
-disabled	Displays information for only those interfaces disabled on the router or on the specified slot or slot/connector pair.

The output includes the following information:

Slot	Slot number on which the interface resides.
Conn	Connector number of the interface.
Circuit	Circuit name assigned to the interface.
State	State of the ATM line: Up, Down, Init (initializing), Disabled, or Absent.
VPCs	Maximum number of virtual path connections supported by the ATM interface.
VCCs	Maximum number of virtual channel connections supported by the ATM interface.

Addr Type	Type of ATM address configured for use by the ATM interface: Private, NSAP E.164, Native E.164, Other, Null, or NotDefined.
Signaling	Whether signaling is enabled or disabled on the ATM interface.
Sig Version	The signaling standard configured for the ATM interface: UNI3.0 or UNI3.1.

show atm line

The **show atm line** command displays information about the ATM Adaptation Layer Controller (ALC) link module service.

The **show atm line** command supports the following subcommand options:

errors	phy errors
phy config	stats

In addition, you can specify any of the following filters (flags) with the above subcommand options:

-slot *<slot>*[/*<connector>*]	Displays ATM line information for the specified slot or slot/connector pair only.
-**enabled**	Displays ATM line information for enabled ATM lines only.
-disabled	Displays ATM line information for disabled ATM lines only.
-sample	Displays a snapshot of ATM line information taken at 10-second intervals.

errors [**-enabled | -disabled**] [**-slot** *<slot>* **| -slot** *<slot>/<connector>*] [**-sample**]

Displays the ATM module physical interface errors table for the ATM routing engine (ARE).

The output includes the following line receive error statistics:

Slot	Slot number on which the ATM physical interface resides.
Conn	Connector number of the physical interface.
Circuit	Circuit name assigned to the interface.
Invalid Headers	Number of received cells dropped because of incorrect header format.
Over Sized SPDUs	Number of packets dropped because their size was greater than the MTU specified for the interface.
Crc Errors	Cyclical redundancy check errors.
Crc10 Errors	Number of OAM cells dropped because they had an invalid CRC-10.
Rx Lack of Rsrcs	Number of packets dropped because no host buffers were available to hold the incoming data.

phy config [**-enabled | -disabled**] [**-slot** *<slot>* **| -slot** *<slot>/<connector>*] [**-sample**]

Displays the ATM module physical interface table for the ATM routing engine (ARE).

The output includes the following physical interface statistics:

Slot	Slot number on which the ATM physical interface resides.
Conn	Connector number of the physical interface.
Circuit	Circuit name assigned to the interface.
Phy State	Physical state of the ATM line (Up or Down).
Speed (Mbps)	Estimate of the interface's current bandwidth: 155,520,000 Mb/s, 140,000,000 Mb/s, 100,000,000 Mb/s, 44,736,000 Mb/s, or 34,368,000 Mb/s.
Type	Interface type: OC-3 MM (multimode), OC-3 SM (single mode), DS-3, or E-3.
Framing Mode	Transceiver mode: SDH, SONET, CBIT, M23, G751, or G832.

phy errors [**-enabled | -disabled**] [**-slot** *<slot>* **| -slot** *<slot>/<connector>*] [**-sample**]

Displays the ATM module physical interface errors table for the ATM routing engine (ARE).

The output includes the following physical interface error statistics:

Slot	Slot number on which the ATM physical interface resides.
Conn	Connector number of the physical interface.
Circuit	Circuit name assigned to the interface.
Tc. Alarm State	State of the driver: Up, Down, Init (initializing), Download (downloading), Config (configuring), or Not Present. Note that this parameter does not represent the state of the physical interface.
HEC Detected	Number of uncorrectable header error check (HEC) errors detected.
HEC Corrected	Number of correctable HEC errors detected.
Out of Cell Delineation	Number of times an out-of-cell delineation occurs. An out-of-cell delineation occurs when 7 consecutive ATM cells have HEC errors.

stats [**-enabled | -disabled**] [**-slot** *<slot>* **| -slot** *<slot>/<connector>*] [**-sample**]

Displays the ATM module I/O statistics table for the ATM routing engine (ARE).

The output includes the following module I/O statistics:

Slot	Slot number on which the ATM physical interface resides.
Conn	Connector number of the physical interface.
Circuit	Circuit name assigned to the interface.
Received Packets	Number of packets received at the transceiver receive interface that have not been discarded.
Transmitted Packets	Number of packets transmitted at the transceiver transmit interface.
Invalid Headers	Number of invalid headers detected by the transceiver interface.
Rx CRC Errors	Number of receive CRC errors detected by the transceiver interface.
Total Errors	Total number of errors detected by the transceiver interface.

show atm services

The **show atm services** command displays all ATM service record instances or a subset of service record instances, along with the AAL data encapsulation type, state, VC type, and ATM address (a combination of network prefix and user part).

This command allows for the following command filters (flags) and filter arguments:

-slot *<slot>*[/*<connector>*]	Displays information about the specified slot or slot/connector pair only.
-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Service	Service name associated with this service record.
Encaps	Encapsulation type of this VC: LAN Emulation, LLC/SNAP, NLPID, or NULL.
State	State of the ATM line: Up, Down, Init (initializing), Reject, or Absent.
Type	Type of virtual circuit: PVC or SVC.
ATM Address	ATM address of this service record. This parameter applies only to SVC service records.

show atm signaling

The **show atm signaling** command displays all ATM interfaces, whether or not they have signaling enabled or disabled, and what version of signaling they are running.

This command allows for the following command filters (flags) and filter arguments:

-slot *<slot>*[/*<connector>*]	Displays information about the specified slot or slot/connector pair only.
-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the ATM circuit.
Signaling	Whether signaling is enabled or disabled on the interface.
Sig Version	The signaling version that the interface is using.

show atm stats vcs

The **show atm stats vcs** command displays the ATM interface VC statistics table for the ATM routing engine (ARE). This table contains statistical information for all ATM VCs on the router or specific information based on the filters you use.

This command allows for the following command filters (flags) and filter arguments:

-slot *<slot>*[/*<connector>*]	Displays statistical information about the specified slot or slot/connector pair only.
-**service** *<servicename>*	Displays statistical information about the specified service record only.
-vpi	Displays statistical information for the specified virtual path identifier (VPI) only.
-vci	Displays statistical information for the specified virtual channel identifier (VCI) only.

The output includes the following information:

Service	Name of the service record containing the virtual channel (VC).
VPI	Virtual path identifier (VPI) of the VC.
VCI	Virtual channel identifier (VCI) of the VC.
Cells Tx	Number of assigned ATM layer cells transmitted at the transceiver transmit interface (T-count).
Cells Rx	Number of ATM layer cells received at the transceiver receive interface that were not discarded (R-count).
Packets TX	Number of packets transmitted at the transceiver transmit interface.
Packets Rx	Number of packets received at the transceiver receive interface that were not discarded.

show atm vcs

The **show atm vcs** command displays the ATM interface VCL table. This table contains information about all ATM virtual channel links on the router or specific information based on the filters you use.

This command allows for the following command filters (flags) and filter arguments:

-slot *<slot>*[/*<connector>*]	Displays VC information about the specified slot or slot/connector pair only.
-**service** *<servicename>*	Displays VC information about the specified service record only.
-vpi	Displays VC information for the specified virtual path identifier (VPI) only.
-vci	Displays VC information for the specified virtual channel identifier (VCI) only.

The output includes the following information:

Service	Name of the service record containing the virtual channel (VC).
VPI	Virtual path identifier (VPI) of the VC.
VCI	Virtual channel identifier (VCI) of the VC.
Type	Type of VC: SVC or PVC.
State	State of the ATM line: Up, Down, Init (initializing), Disabled, or Absent.
Hybrid/Bridged VCs?	Whether this is a hybrid/bridged VC. Yes means the VC operates as a hybrid access mode VC; No means the VC works in group access mode only.
AAL	ATM Adaptation Layer type of this VC: AAL5.
Encaps	Encapsulation type of this VC: LLC/SNAP, NULL, LANE8023, LANE8025, NLPID, Unknown, or OTHER.
Xmt PCR	Transmit peak cell rate (PCR) for this VC (in cells/s).
Xmt SCR	Transmit sustainable cell rate (SCR) for this VC (in cells/s).

show classical-ip configuration

The **show classical-ip configuration** command displays information for all classical IP interfaces on the ATM router or for one specific IP address. This command allows for the following command filter (flag) and filter argument:

-**ipaddr** *<ip_address>*	Displays information about the specified IP address only.

The output includes the following information:

Interface	The IP address of the classical IP interface.
Mode	The mode of the classical IP interface (client or server).
Server Address (if client)	The ATM address of the server with which the classical IP client communicates.

show classical-ip interface

The **show classical-ip interface** command displays information for all classical IP interfaces on the ATM router or for one specific IP address. This command allows for the following command filter (flag) and filter argument:

-**ipaddr** *<ip_address>*	Displays information about the specified IP address only.

The output includes the following information:

Interface	IP address of the classical IP interface.
Address	ATM address of the server with which the classical IP client communicates.
Server Conn. State	The state of the connection to the ATMARP server.

show classical-ip stats

The **show classical-ip stats** command displays statistics for all classical IP interfaces on the ATM router or for one specific IP address. This command allows for the following command filter (flag) and filter argument:

-**ipaddr** *<ip_address>*	Displays statistical information about the specified IP address only.

The output includes the following information:

Interface	IP address of the classical IP interface.
Open SVCs	Number of open SVCs.
Calls Attempted	Number of calls ATMARP has attempted.
Calls Succeeded	Number of originated calls that have completed successfully.
Failed May Retry	Number of attempted calls that failed but were retried.
Failed No Retry	Number of attempted calls that failed but were not retried.
Calls Accepted	Number of received calls that were accepted.

show classical-ip table

The **show classical-ip table** command displays information for each classical IP interface. This command allows for the following command filter (flag) and filter argument:

-**ipaddr** *<ip_address>*	Displays information about the specified IP address only.

The output includes the following information:

IP Address	IP address of the classical IP interface.
Life	The interval between registration refreshes; the duration a registration is considered valid.
ATM Address	ATM address associated with the classical IP client.
Vpi.Vci	VPI/VCI pair associated with the classical IP client.

show dsx3 circuits

The **show dsx3 circuits** command displays information about the DSX3 circuits in the configuration.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the DSX3 circuit.
Circuit	The name of the circuit associated with this line.
Sec into Interval	The number of seconds into the current 15-minute interval.
# of Intervals	The number of complete 15-minute intervals. The value is 96 unless the interface was brought online within the last 24 hours. In that case, the value is the number of complete 15-minute intervals since the interface has been online.
Line Coding	The line coding on this circuit. The line coding options are: • B3ZS • HDB3 The line coding specifies patterns of normal bits and bipolar violations used to replace sequences of zero bits of a certain length.
Line Type Status	The line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

show dsx3 current

The **show dsx3 current** command displays line, Pbit, Cbit, and Plcp statistics for the DSX3 circuits in the configuration.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the DSX3 circuit.
Circuit	Name of the circuit associated with this line.
Sec into Interval	The number of seconds into the current 15-minute interval.
# of Intervals	The number of complete 15-minute intervals.
Line Coding	The line coding on this circuit. The line coding options are: • B3ZS • HDB3
Line Type Status	The line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

Line Stats

Circuit	Name of the circuit associated with this line.
Interval	The current interval.
LESs	The number of line errored seconds (LESs) in the current interval. An LES is a second in which one or more coding violations occurred or one or more LOS defects were detected.
SEFSs	The number of severely errored framing seconds (SEFSs) in the current interval. An SEFS is a second with one or more OOF errors or an AIS defect.
UASs	The number of unavailable seconds (UASs) in the current interval.
LCVs	The number of line coding violations (LCVs) in the current interval. A line coding violation is a count of both bipolar violations (BPVs) and excessive zero (EXZ) error events.

Pbit Status

Circuit	Name of the circuit associated with this line.
Interval	The current interval.
PESs	The number of P-bit errored seconds (PESs) in the current interval. A PES is a second with one or more P-bit coding violations, one or more OOF defects, or a detected incoming AIS. The PES does not increment when counting UASs.
PSESs	The number of P-bit severely errored seconds (PSESs) in the current interval. A PSES is a second with 44 or more PCVs, one or more OOF defects, or a detected incoming AIS. The PSES value does not increment when counting UASs.
UASs	The number of unavailable seconds (UASs) in the current interval.
PCVs	The number of P-bit coding violations (PCVs) in the current interval. For all DS3/E3 applications, a coding violation error event is a P-bit Parity Error event. A P-bit Parity Error event occurs when the DS-3/E-3 M-frame receives a P-bit code that is not identical to the corresponding locally calculated code.

Cbit Stats

Circuit	Name of the circuit associated with this line.
Interval	The current interval.
CESs	The number of C-bit errored seconds (CESs) in the current interval. A CES is a second with one or more CCVs, one or more OOF defects, or a detected incoming AIS. This count is only for the C-bit Parity DS3 applications. The CES value does not increment when counting UASs.
CSESs	The number of C-bit severely errored seconds (CSESs) in the current interval. A CSES is a second with 44 or more CCVs, one or more OOF defects, or a detected incoming AIS. This count applies only to C-bit Parity DS3 applications. The CSES value does not increment when counting UASs.
UASs	The number of unavailable seconds (UASs) in the current interval.
CCVs	The number of C-bit coding violations (CCVs) in the current interval. For C-bit Parity and SYNTRAN DS3 applications, this is the count of coding violations reported via the C-bits. For C-bit Parity, it is a count of C-bit parity errors occurring in the accumulation interval.

FarEnd Cbit Stats

Circuit	Name of the circuit associated with this line.
Interval	The current interval.
CESs	The number of C-bit errored seconds (CESs) in the current interval. A CES is a second with one or more CCVs, one or more OOF defects, or a detected incoming AIS. This count is only for C-bit Parity DS3 applications. The CES value does not increment when counting UASs.
CSESs	The number of C-bit severely errored seconds (CSESs) in the current interval. A CSES is a second with 44 or more CCVs, one or more OOF defects, or a detected incoming AIS. This count applies only to C-bit Parity DS3 applications. The CSES value does not increment when counting UASs.
UASs	The number of unavailable seconds (UASs) in the current interval.
CCVs	The number of C-bit coding violations (CCVs) in the current interval. For C-bit Parity DS3 applications, this is the count of coding violations reported via the C-bits. For C-bit Parity, it is a count of C-bit parity errors occurring in the accumulation interval.

DS3 Plcp Stats

Circuit	Name of the circuit associated with this line.
Interval	The current interval.
SEFSs	The number of severely errored framing seconds (SEFSs) in the current interval. An SEFS is a second with one or more OOF errors or an AIS defect.
UASs	The number of unavailable seconds (UASs) in the current interval.
Status	Indicates the line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

show dsx3 history

The **show dsx3 history** command displays line, Pbit, Cbit, and Plcp statistics for the DSX3 circuits in the configuration over specific intervals.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the DSX3 circuit.
Circuit	Name of the circuit associated with this line.
Sec into Interval	The number of seconds into the current interval.
# of Intervals	The number of complete intervals.
Line Coding	The line coding on this circuit. The line coding options are: • B3ZS • HDB3
Line Type Status	The line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

Line Stats

Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
LESs	The number of line errored seconds (LESs) for each interval category.
SEFSs	The number of severely errored framing seconds (SEFSs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
LCVs	The number of line coding violations (LCVs) for each interval category.

Pbit Status

Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
PESs	The number of P-bit errored seconds (PESs) for each interval category.
PSESs	The number of P-bit severely errored seconds (PSESs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
PCVs	The number of P-bit coding violations (PCVs) for each interval category.

Cbit Stats

Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
CESs	The number of C-bit errored seconds (CESs) for each interval category.
CSESs	The number of C-bit severely errored seconds (CSESs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
CCVs	The number of C-bit coding violations (CCVs) for each interval category.

FarEnd Cbit Stats

Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
CESs	The number of C-bit errored seconds (CESs) for each interval category.
CSESs	The number of C-bit severely errored seconds (CSESs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
CCVs	The number of C-bit coding violations (CCVs) for each interval category.

DS3 Plcp Stats

Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
SEFSs	The number of severely errored framing seconds (SEFSs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
Status	Indicates the line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

show lane clients

The **show lane clients** command displays the ATM LAN emulation client running config info table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
LecID	LEC ID that the LE server (LES) assigns during the join state.
State	State for the LEC: INITIAL, LECSCONNECT, CONFIGURE, JOIN, INITIAL_REG, BUSCONNECT, or OPERATIONAL.
Fail Code	Status code from the last failed configure or join response.
Cfg Src	Indicates whether this LEC used the LAN emulation configuration server (LECS) and if so, what method is used to establish the configuration direct VCC: VIAILMI, KNOWNADR, CFGPVC, or NO LECS.
LAN type	Data frame format this client is now using: Unspecified, IEEE 802.3, or IEEE 802.5.
Max Data Frm Size	Maximum data frame size this client is now using: Unspecified, 1516, 4544, 9234, or 18190.
ELAN Name	The name of the emulated LAN (ELAN) that this client last joined.
Proxy	Indicates whether the LEC acts as a proxy when it joins an ATM emulated LAN: 1 (true) or 2 (false).
Primary addr	ATM address of the LEC.
Cfg Server addr	ATM address of the LAN emulation configuration server.
LE Server addr	ATM address of the LAN emulation server.

show lane configuration

The **show lane configuration** command displays portions of the ATM LAN emulation client table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
LAN Name	Emulated LAN name this client will use the next time it returns to the initial state.
LAN Type	Data frame format that this client will use the next time it returns to the initial state: Unspecified, IEEE 802.3, or IEEE 802.5.
State	State of the LEC: INITIAL, LECSCONNECT, CONFIGURE, JOIN, INITIAL_REG, BUSCONNECT, or OPERATIONAL.
Mode	The configuration mode of the LAN emulation client: AUTO or MANUAL.
LECS ATM addr	Configured ATM address of the LAN emulation configuration server.

show lane data-vcs

The **show lane data-vcs** command displays portions of the ATM LAN emulation client table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
Data Direct	The VPI/VCI pair that identifies the data direct VCCs (if they exist) at the point where they connect to this LEC.

show lane le-arp

The **show lane le-arp** command displays the ATM LAN emulation client MAC-to-ATM cache table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
IsRemote	Indicates whether the MAC address belongs to a remote client.
EntryType	Indicates how this table entry was created: LEARNED, LEARNED CTRL, LEARNED DATA, STATIC VOL, STATIC NONVOL, or OTHER. For the router, the LEC always learns this entry using the control VCC; the entry type is never STATIC.
Status	Row status: ENABLE or DISABLE. For the router, the status is always ENABLE.
VPI	Virtual path identifier (VPI) associated with this MAC address.
VCI	Virtual channel identifier (VCI) associated with this MAC address.
MAC Address	Remote MAC address.
ATM Address	ATM address representing the MAC address.

show lane le-rd-arp

The **show lane le-rd-arp** command displays the ATM LAN emulation client RD-to-ATM ARP cache table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
EntryType	Indicates how this table entry was created: LEARNED, LEARNED CTRL, LEARNED DATA, STATIC VOL, STATIC NONVOL, or OTHER. For the router, the LEC always learns this entry using the control VCC; the entry type is never STATIC.
Status	Row status: ENABLE or DISABLE. For the router, the status is always ENABLE.
VPI	The virtual path identifier (VPI) for the LEC.
VCI	The virtual channel identifier (VCI) for the LEC.
SEG ID	The segment ID on which the LEC resides.
Br#	The bridge number on which the LEC resides.
ATM Address	The ATM address associated with the LEC.

show lane les

The **show lane les** command displays the ATM LAN emulation servers in the order they were configured.

The output includes the following information:

Slot/Module/Connector	The slot location of the ATM module within the chassis, the module number (System 5000 platforms only), and the connector number.
Service	Name of the service record containing the client.
LES Name	Name you assigned to the LAN emulation server entry.
State	State of the LES entry: enabled or disabled.
LES Address	The LAN emulation server ATM address.

show lane mac

The **show lane macs** command displays the ATM LAN emulation client MAC address table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
MAC Address	The local MAC address on this ATM interface that the LEC uses.
ATM address registered for MAC address	The ATM address configured for the service record that this LEC uses.

show lane servers

The **show lane servers** command displays the ATM LAN emulation client server VCC table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
Config Direct VPI	The virtual path identifier (VPI) that identifies the configuration direct VCC (if it exists) at the point where it connects to this LEC.
Config Direct VCI	The virtual channel identifier (VCI) that identifies the configuration direct VCC (if it exists) at the point where it connects to this LEC.
Control Direct VPI	The VPI that identifies the control direct VCC (if it exists) at the point where it connects to this LEC.
Control Direct VCI	The VCI that identifies the control direct VCC (if it exists) at the point where it connects to this LEC.
Control Distributed VPI	The VPI that identifies the control distributed VCC (if it exists) at the point where it connects to this LEC.
Control Distributed VCI	The VCI that identifies the control distributed VCC (if it exists) at the point where it connects to this LEC.
Multicast Send VPI	The VPI that identifies the multicast send VCC (if it exists) at the point where it connects to this LEC.
Multicast Send VCI	The VCI that identifies the multicast send VCC (if it exists) at the point where it connects to this LEC.
Multicast Forward VPI	The VPI that identifies the multicast forward VCC (if it exists) at the point where it connects to this LEC.
Multicast Forward VCI	The VCI that identifies the multicast forward VCC (if it exists) at the point where it connects to this LEC.

show lane stats

The **show lane stats** command displays the ATM LAN emulation statistics table. This command allows for the following command filter (flag) and filter argument:

-**service** *<servicename>*	Displays statistical information about the specified service record only.

The output includes the following information:

Slot	Slot number on which the LAN emulation client resides.
Conn	Physical port number on which the LAN emulation client resides.
Service	Name of the service record containing the client.
Req Out	Number of MAC-to-ATM ARP requests this LEC sent over the logical user-to-network interface (LUNI) associated with this emulated packet interface.
Req In	Number of MAC-to-ATM ARP requests this LEC received over the LUNI associated with this emulated packet interface.
ReplyOut	Number of MAC-to-ATM ARP replies this LEC sent over the LUNI associated with this emulated packet interface.
ReplyIn	Number of MAC-to-ATM ARP replies this LEC received over the LUNI associated with this emulated packet interface.
FrameOut	Total number of control packets this LEC sent over the LUNI associated with this emulated packet interface.
FrameIn	Total number of control packets this LEC received over the LUNI associated with this emulated packet interface.
SVCFails	Number of SVCs this LEC unsuccessfully tried to open.

show sonet circuits

The **show sonet circuits** command displays portions of the SONET entries table.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	The name of the circuit associated with this line.
Sec into Interval	The number of seconds into the current 15-minute interval.
# of Intervals	The number of complete 15-minute intervals. The value is 96 unless the interface was brought online within the last 24 hours. In that case, the value is the number of complete 15-minute intervals since the interface has been online.
Line Coding	The line coding on this circuit. The line coding options are: • B3ZS • HDB3 The line coding specifies patterns of normal bits and bipolar violations used to replace sequences of zero bits of a certain length.
Line Type Status	The line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

show sonet current

The **show sonet current** command displays portions of the SONET entries table.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Sec into Interval	The number of seconds into the current 15-minute interval.
# of Intervals	The number of complete 15-minute intervals.
Line Coding	The line coding on this circuit. The line coding options are: • B3ZS • HDB3
Line Type Status	The line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

Line Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	The current interval.
LESs	The number of line errored seconds (LESs) in the current interval. An LES is a second in which one or more coding violations occurred or one or more LOS defects were detected.
SEFSs	The number of severely errored framing seconds (SEFSs) in the current interval. An SEFS is a second with one or more OOF errors or an AIS defect.
UASs	The number of unavailable seconds (UASs) in the current interval.
LCVs	The number of line coding violations (LCVs) in the current interval. A line coding violation is a count of both bipolar violations (BPVs) and excessive zero (EXZ) error events.

Pbit Status

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	The current interval.
PESs	The number of P-bit errored seconds (PESs) in the current interval. A PES is a second with one or more P-bit coding violations, one or more OOF defects, or a detected incoming AIS. The PES does not increment when counting UASs.
PSESs	The number of P-bit severely errored seconds (PSESs) in the current interval. A PSES is a second with 44 or more PCVs, one or more OOF defects, or a detected incoming AIS. The PSES value does not increment when counting UASs.
UASs	The number of unavailable seconds (UASs) in the current interval.
PCVs	The number of P-bit coding violations (PCVs) in the current interval. For all SONET applications, a coding violation error event is a P-bit Parity Error event. A P-bit Parity Error event occurs when the SONET M-frame receives a P-bit code that is not identical to the corresponding locally calculated code.

Cbit Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	The current interval.
CESs	The number of C-bit errored seconds (CESs) in the current interval. A CES is a second with one or more CCVs, one or more OOF defects, or a detected incoming AIS. This count is only for the C-bit Parity SONET applications. The CES value does not increment when counting UASs.
CSESs	The number of C-bit severely errored seconds (CSESs) in the current interval. A CSES is a second with 44 or more CCVs, one or more OOF defects, or a detected incoming AIS. This count applies only to C-bit Parity SONET applications. The CSES value does not increment when counting UASs.
UASs	The number of unavailable seconds (UASs) in the current interval.
CCVs	The number of C-bit coding violations (CCVs) in the current interval. For C-bit Parity and SONET applications, this is the count of coding violations reported via the C-bits. For C-bit Parity, it is a count of CP-bit parity errors occurring in the accumulation interval.

FarEnd Cbit Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	The current interval.
CESs	The number of C-bit errored seconds (CESs) in the current interval. A CES is a second with one or more CCVs, one or more OOF defects, or a detected incoming AIS. This count is only for C-bit Parity DS3 applications. The CES value does not increment when counting UASs.
CSESs	The number of C-bit severely errored seconds (CSESs) in the current interval. A CSES is a second with 44 or more CCVs, one or more OOF defects, or a detected incoming AIS. This count applies only to C-bit Parity DS3 applications. The CSES value does not increment when counting UASs.
UASs	The number of unavailable seconds (UASs) in the current interval.
CCVs	The number of C-bit coding violations (CCVs) in the current interval. For C-bit Parity SONET applications, this is the count of coding violations reported via the C-bits. For C-bit Parity, it is a count of CP-bit parity errors occurring in the accumulation interval.

DS3 Plcp Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	The current interval.
SEFSs	The number of severely errored framing seconds (SEFSs) in the current interval. An SEFS is a second with one or more OOF errors or an AIS defect.

UASs	The number of unavailable seconds (UASs) in the current interval.
Status	Indicates the line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

show sonet history

The **show sonet history** command displays portions of the SONET entries table.

The output includes the following information:

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Sec into Interval	The number of seconds into the current interval.
# of Intervals	The number of complete intervals.
Line Coding	The line coding on this circuit. The line coding options are: • B3ZS • HDB3
Line Type Status	The line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

Line Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
LESs	The number of line errored seconds (LESs) for each interval category.
SEFSs	The number of severely errored framing seconds (SEFSs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
LCVs	The number of line coding violations (LCVs) for each interval category.

Pbit Status

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
PESs	The number of P-bit errored seconds (PESs) for each interval category.
PSESs	The number of P-bit severely errored seconds (PSESs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
PCVs	The number of P-bit coding violations (PCVs) for each interval category.

Cbit Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
CESs	The number of C-bit errored seconds (CESs) for each interval category.
CSESs	The number of C-bit severely errored seconds (CSESs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
CCVs	The number of C-bit coding violations (CCVs) for each interval category.

FarEnd Cbit Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
CESs	The number of C-bit errored seconds (CESs) for each interval category.
CSESs	The number of C-bit severely errored seconds (CSESs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
CCVs	The number of C-bit coding violations (CCVs) for each interval category.

SONET Plcp Stats

Slot/<Module>/Conn	The slot, module, and connector number of the SONET circuit.
Circuit	Name of the circuit associated with this line.
Interval	A historical breakdown of intervals, including: • The current interval (incomplete) • All but the last two intervals (that is, all intervals except the current interval and the previous interval) • The previous interval (that is, the last complete interval) • All of the intervals (total)
SEFSs	The number of severely errored framing seconds (SEFSs) for each interval category.
UASs	The number of unavailable seconds (UASs) for each interval category.
Status	Indicates the line status of the interface. The possible status values are: • *NoAlarm* - no alarm present • *RRAI* - receiving yellow remote alarm indication • *TRAI* - transmitting yellow remote alarm indication • *RAIS* - receiving Alarm Indications Signal (AIS) failure state • *TAIS* - transmitting AIS failure state • *LOF* - receiving Loss of Frame (LOF) failure state • *LOS* - receiving Loss of Signal (LOS) failure state • *Loopback* - looping the received signal • *TestCode* - receiving a test pattern • *LowSignal* - low signal

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