

# Catalyst 2900 Series XL ATM Modules Installation and Configuration Guide

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Text Part Number: 78-5472-01

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# TABLE OF CONTENTS

	Who Should Read This Guide	vii
	Related Publications	vii
	How This Guide is Organized	viii
	Conventions Used in This Guide	ix
<b>Chapter 1</b>	<b>Overview</b>	<b>1-1</b>
	Key Features	1-4
	Physical Description	1-5
	ATM 155 MM Fiber Module	1-5
	ATM 155 SM Fiber Modules	1-8
	ATM 155 UTP Module	1-11
<b>Chapter 2</b>	<b>Installing an ATM Module</b>	<b>2-1</b>
	Inspecting the Packing List	2-1
	EMC Regulatory Statements	2-1
	U.S.A.	2-1
	Taiwan	2-2
	LANE Configuration Requirements	2-2
	Avoiding Electrostatic Discharge	2-3
	Power-Up Considerations	2-3
	Installing the Module	2-4
	Connecting the Cables	2-6
	Fiber-Optic Cable	2-6
	UTP Cable	2-7
	Removing the Module	2-8
<b>Chapter 3</b>	<b>Configuring the ATM Module</b>	<b>3-1</b>
	Accessing the Command-Line Interface	3-1
	Configuring the LEC	3-2
	Verifying the LEC Configuration	3-4

	Verifying ATM and LANE Status	3-4
	Verifying ATM Port Statistics	3-5
	Configuring Support for RFC-1483 PVC	3-6
	Using LECs	3-7
	Using RFC-1483 PVCs	3-7
	Configuration Example for RFC-1483 PVC	3-8
<b>Chapter 4</b>	<b>Troubleshooting</b>	<b>4-1</b>
	Understanding POST Results	4-1
	Recovering from Corrupted Software	4-2
	Recovering from a Lost or Forgotten Password	4-4
	Upgrading the Module Software	4-5
	Downloading Files from CCO	4-6
	Displaying the IP Address of the TFTP Server	4-6
	Upgrading the Software Using the CLI	4-7
	Upgrading the Software Using CVSM	4-7
<b>Appendix A</b>	<b>Technical Specifications</b>	<b>A-1</b>
	ATM 155 MM Fiber and ATM 155 UTP Modules	A-1
	ATM 155 SM Fiber Modules	A-2
<b>Appendix B</b>	<b>Command Reference</b>	<b>B-1</b>
	CLI Command Modes	B-1
	User EXEC Mode	B-3
	Privileged EXEC Mode	B-4
	Global Configuration Mode	B-5
	Interface Configuration Mode	B-6
	Line Configuration Mode	B-7
	ATM Module Commands	B-9
	atm bind	B-9
	atm pvc	B-11
	show atm vlan	B-14
	Supported Cisco IOS Commands	B-16

**Appendix C      Configuration Examples      C-1**

LANE Configuration Example	C-1
Configuration Example Assumptions	C-2
Configuration Example Procedure	C-3
RFC-1483 PVC Configuration Example	C-8
Configuration Example Assumptions	C-9
Configuration Example Procedure	C-10
Configure VLANs on the Catalyst 2924M XL Switch (2)	C-11
Configure PVCs on the ATM Network	C-12
Configure Catalyst 2924M XL Switch (1)	C-16
Configure PVCs on Catalyst 2924M XL Switch (2)	C-18

**Appendix D      Translated Safety Warnings      D-1**

Class 1 Laser Product Warning	D-1
Laser Beam Exposure Warning	D-2

**Index**





# About This Guide

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This guide contains information necessary to install and configure your ATM modules. This information includes guiding you through the LAN emulation (LANE) client configuration process to enable a successful module installation. Related documents are referenced in this guide. These documents provide additional information about products that work with the ATM modules, such as the LightStream 1010 and Catalyst 5000 devices.

## Who Should Read This Guide

This manual is for technicians who install and maintain Catalyst 2900 series XL switches, hereafter referred to as the Catalyst 2900 series switches. It is assumed that the individual is familiar with 10BaseT, 100BaseT, and Asynchronous Transfer Mode (ATM) LAN concepts and terminology.

This manual explains how to install the Catalyst 2900 series XL ATM modules (hereafter referred to as the ATM modules) in the Catalyst 2900 series switch and configure its LAN emulation client (LEC) software.

## Related Publications

For detailed information about LANE and its usage in LAN environments, refer to the following Cisco Systems publications:

- *Wide-Area Networking Configuration Guide*
- *Catalyst 5000 Series Advanced Software Configuration Guide*
- *Catalyst 5000 Series Command Reference*

- *Catalyst 5000 Series Switch Workgroup MIBs User Quick Reference*
- *LightStream 1010 ATM Switch Software Configuration Guide*

Other related publications include:

- *Catalyst 2900 Series XL Installation and Configuration Guide*
- *Catalyst 2900 Series XL Command Reference*
- *Catalyst 2900 Series XL Enterprise Edition Software Configuration Guide*

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## How This Guide is Organized

This manual is organized as follows:

- Chapter 1, “Overview,” describes the ATM module and its key features and provides a typical ATM-to-LAN topology example.
- Chapter 2, “Installing an ATM Module,” provides procedures for installing and removing the ATM module from the Catalyst 2900 series switch and explains LANE configuration requirements.
- Chapter 3, “Configuring the ATM Module,” provides procedures for configuring a ATM module LEC and for verifying its configuration.
- Chapter 4, “Troubleshooting,” describes how to identify and resolve some of the problems that might arise when you are installing and configuring an ATM module.



- Appendix A, “Technical Specifications,” provides technical specifications.
- Appendix B, “Command Reference,” describes the Cisco IOS commands that are used with the ATM modules.
- Appendix C, “Configuration Examples,” provides examples of the process of configuring LANE servers and clients and configuring support for RFC-1483 permanent virtual connections (PVCs).
- Appendix D, “Translated Safety Warnings,” provides translations of the safety warnings that appear in this manual.

## Conventions Used in This Guide

This manual uses the following conventions:

- The caret character (^) represents the Control key.

For example, the key combinations ^D and Ctrl-D are equivalent; both mean you should hold down the Control key while pressing the D key. Keys are indicated in capital letters, but are not case sensitive.

- A character string is defined as a nonquoted set of characters.

For example, when setting an SNMP community string to “public,” do not use quotation marks around the string; otherwise, the string includes the quotation marks.

Command descriptions use these conventions:

- Commands and keywords are in **boldface**.
- Arguments for which you supply values are in *italic*.
- Optional elements are shown in square brackets ([ ]); alternative optional elements are separated by vertical bars (|).
- Alternative but required elements are grouped in braces ({ }) and separated by vertical bars (|).

Examples use these conventions:

- Examples that contain system prompts denote interactive sessions, indicating that you enter commands at the prompt. The system prompt indicates the current command mode. For example, the prompt `Switch(config)#` indicates global configuration mode.
- Management console sessions and information the system displays are shown in `screen font`.
- Information you enter is in **boldface screen font**.
- Nonprinting characters, such as passwords, are inside angle brackets (< >).
- Default responses to system prompts are inside square brackets ([ ]).

Cautions, warnings, and notes use these conventions:

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**Note** Means *reader take note*. Notes contain helpful suggestions or references to materials not contained in this manual.

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**Caution** Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.



**Warning** Means *danger*. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents.

To see translations of the warnings that appear in this publication, refer to the “Translated Safety Warnings” appendix.

**Waarschuwing** Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. (Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het aanhangsel “Translated Safety Warnings” (Vertalingen van veiligheidsvoorschriften) raadplegen.)

**Varoitus** Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. (Tässä julkaisussa esiintyvien varoitusten käännökset löydät liitteestä "Translated Safety Warnings" (käännetyt turvallisuutta koskevat varoitukset).)

**Attention** Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures. Avant d'accéder à cet équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures courantes de prévention des accidents. Pour obtenir les traductions des mises en garde figurant dans cette publication, veuillez consulter l'annexe intitulée « Translated Safety Warnings » (Traduction des avis de sécurité).

**Warnung** Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. (Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Anhang mit dem Titel "Translated Safety Warnings" (Übersetzung der Warnhinweise).)

**Avvertenza** Questo simbolo di avvertenza indica un pericolo. Si è in una situazione che può causare infortuni. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nell'appendice, "Translated Safety Warnings" (Traduzione delle avvertenze di sicurezza).

**Advarsel** Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. (Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i vedlegget "Translated Safety Warnings" [Oversatte sikkerhetsadvarsler].)

**Aviso** Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. (Para ver as traduções dos avisos que constam desta publicação, consulte o apêndice “Translated Safety Warnings” - “Traduções dos Avisos de Segurança”).

**Advertencia** Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. (Para ver traducciones de las advertencias que aparecen en esta publicación, consultar el apéndice titulado “Translated Safety Warnings.”)

**Varning!** Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. (Se förklaringar av de varningar som förekommer i denna publikation i appendix "Translated Safety Warnings" [Översatta säkerhetsvarningar].)

# Overview

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This chapter describes the Catalyst 2900 series XL ATM module, its key features, and its installation and configuration requirements.

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**Note** Throughout this manual, the Catalyst 2900 series XL ATM module is referred to as the *ATM module*. The Catalyst 2900 series XL switch is referred to as the *Catalyst 2900 series switch*.

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The Catalyst 2900 series switches support four types of ATM modules.

- ATM 155 multimode (MM) Fiber module
- ATM 155 single-mode (SM) medium-reach (MR) Fiber module
- ATM 155 single-mode (SM) long-reach (LR) Fiber module
- ATM 155 unshielded twisted-pair (UTP)

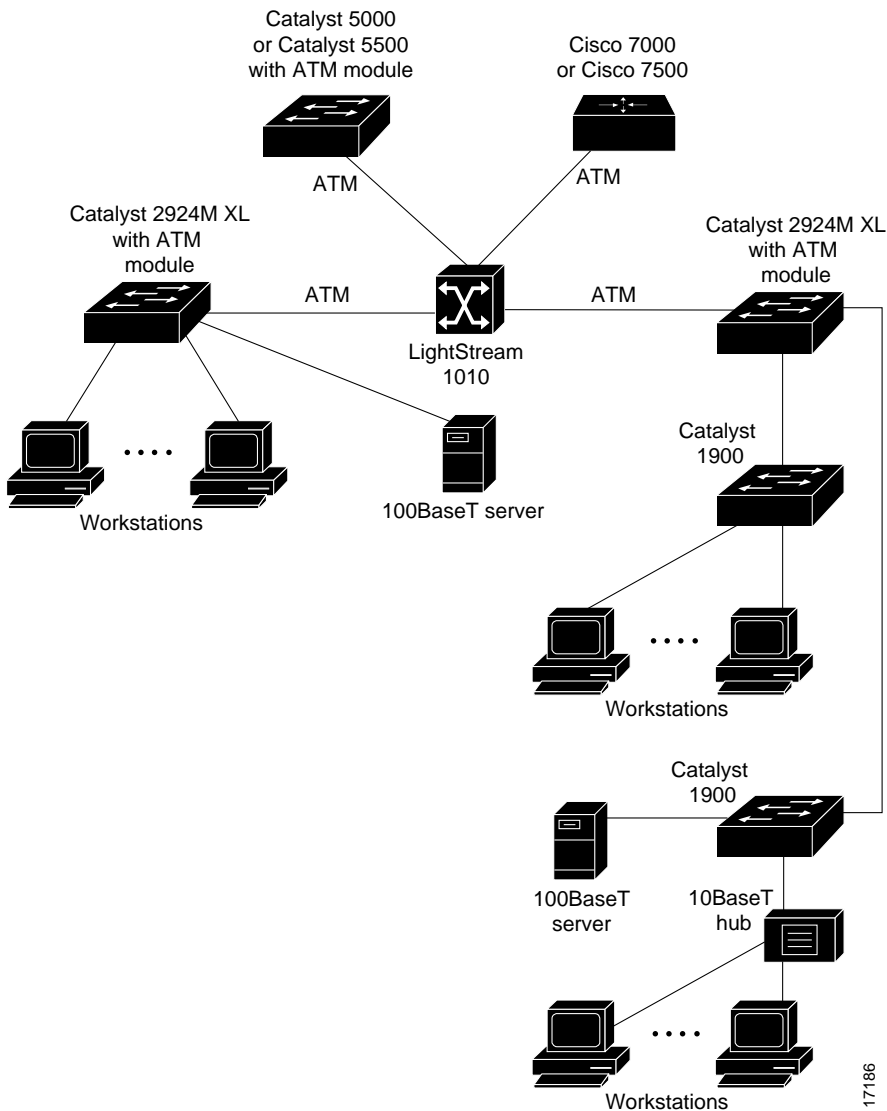
Each module provides a physical-layer interface between the ATM module and an ATM switch. You can use the ATM module to connect workstations, hubs, and other switches to the following ATM devices:

- ATM switch, such as the LightStream 1010
- Multilayer LAN switch (such as the Catalyst 5000) with an installed ATM module
- Router with an ATM interface, such as the Cisco 7000

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Figure 1-1 shows a typical ATM-to-LAN topology. Two Catalyst 2900 series switches are connected to other ATM-supported devices through the ATM modules. The link between the LightStream 1010 ATM switch and the other devices provides 155 Mbps of bandwidth over a 2-kilometer MM fiber-optic cable, 15-kilometer medium-reach SM fiber-optic cable, 40-kilometer long-reach SM fiber-optic cable, or 100-meter UTP cable.

**Figure 1-1      ATM-to-LAN Topology**



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## Key Features

Each ATM module includes the following features:

- Management through an SNMP management station, the Cisco IOS command-line interface (CLI), or the web-based Cisco Visual Switch Manager (CVSM)
- Full-duplex operation
- 155.52-Mbps data-transfer rate
- Store-and-forward packet relay
- LAN emulation client (LEC) for emulated LANs (ELANs)
- ATM Adaptation Layer 5 (AAL5) for LAN emulation (LANE) data transfer
- Multiple ELANs support for LANE (Catalyst 2900 series Cisco IOS Release 11.2(8)SA5 or later or with IOS Release 12.0 or later)
- Multiple virtual LAN (VLAN) mappings for Request For Comments (RFC) 1483 (Catalyst 2900 series IOS Release 11.2(8)SA5 or later or with IOS Release 12.0 or later)
- User-Network Interface (UNI) versions 3.0 and 3.1 for switched virtual connections (SVCs) and permanent virtual connections (PVCs)
- Support for Catalyst 2900 series IOS Release 11.2(8)SA5 or later
- Supports up to 64 VLANs or ELANs

Each ATM module supports the following ATM management features:

- Integrated Local Management Interface (ILMI) for ATM UNI versions 3.0 and 3.1 Management Information Bases (MIBs)
- Operation, Administration, and Maintenance (OAM) cell implementation

Each ATM module complies with the following standards:

- LANE 1.0 for LANE client only
- Synchronous Optical Network (SONET) and Synchronous Transport Signal level 3, concatenated (STS-3c) physical layer
- Synchronous Digital Hierarchy (SDH) STM-1



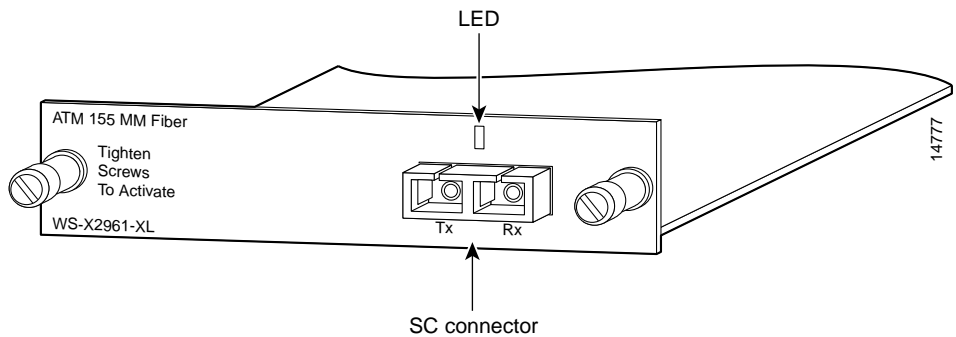
## Physical Description

This section describes the physical characteristics of the ATM modules. LED descriptions and connector and cable requirements for all models are included.

### ATM 155 MM Fiber Module

The ATM 155 MM Fiber module (shown in Figure 1-2) is a multimode ATM module that has one LED and one SC fiber-optic connector.

**Figure 1-2**      **ATM 155 MM Fiber Module**



LED Description

The indicator on the front panel of the MM Fiber module illuminates in two-colors to indicate the operating status of the module. The LED is described in Table 1-1.

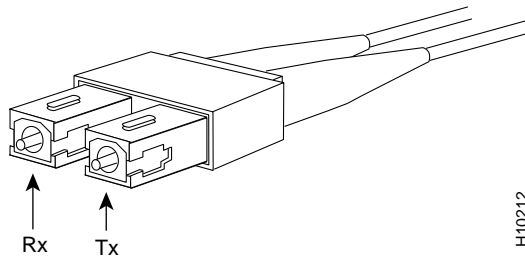
**Table 1-1      ATM 155 MM Fiber Module LED Description**

Color	Operating Status
Green	The module port is connected to an operational ATM switch at the remote end; it is steady when there is no activity.
Flashing green	The module is transmitting or receiving data. The LED flashes rapidly when the traffic level is high.
Amber	The module is disabled because it did one of the following: <ul style="list-style-type: none"><li>• Responded to an administrative action</li><li>• Encountered a secure address violation</li><li>• Failed the power-on self-test (POST)</li></ul>
Off	The module is not connected to the ATM network of the Catalyst 2900 series switches or another ATM device.

## SC Connector and Fiber-Optic Cabling Requirements

The ATM 155 MM Fiber module requires an SC connector and fiber-optic cable as shown in Figure 1-3. The maximum distance for multimode fiber-optic network connections is 2 kilometers.

**Figure 1-3 SC Connector and Fiber-Optic Cable**

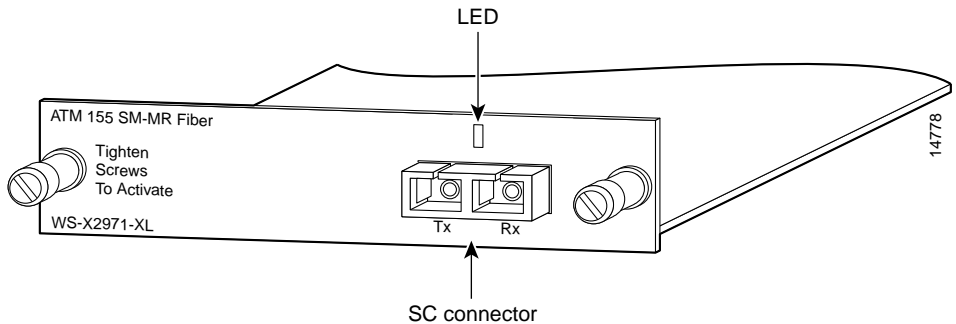


The module transmits data through the transmit (Tx) fiber-optic port and receives data from the receive (Rx) fiber-optic port. The fiber-optic port transmits on a 1300-nanometer wavelength.

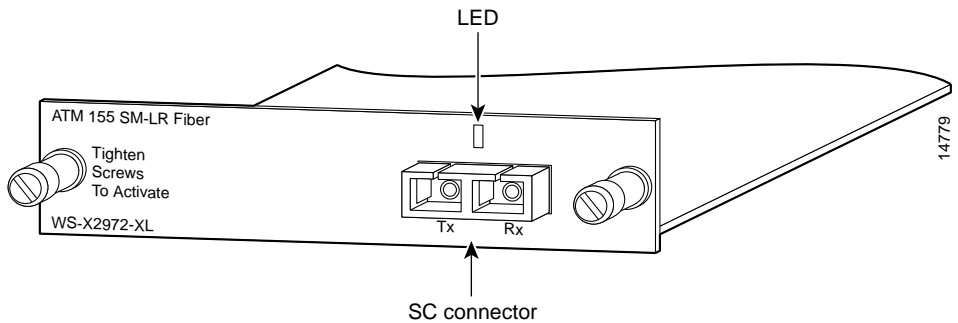
## ATM 155 SM Fiber Modules

The ATM 155 SM Fiber modules (shown in Figure 1-4 and Figure 1-5) consist of two single-mode ATM modules: a medium-reach version (SM-MR) and a long-reach version (SM-LR). Like the ATM 155 MM Fiber module, the ATM 155 SM Fiber modules have one LED and one SC fiber-optic connector.

**Figure 1-4 ATM 155 SM-MR Fiber Module**



**Figure 1-5 ATM 155 SM-LR Fiber Module**



LED Description

The indicator on the front panels of the SM-MR and SM-LR Fiber modules illuminates in two-colors to indicate the operating status of the modules. The LED is described in Table 1-2.

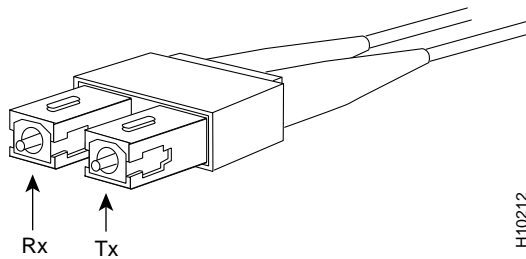
**Table 1-2      ATM SM Fiber Modules LED Description**

Color	Operating Status
Green	The module port is connected to an operational ATM switch at the remote end; it is steady when there is no activity.
Flashing green	The module is transmitting or receiving data. The LED flashes rapidly when the traffic level is high.
Amber	The module is disabled because it did one of the following: <ul style="list-style-type: none"><li>• Responded to an administrative action</li><li>• Encountered a secure address violation</li><li>• Failed the power-on self-test (POST)</li></ul>
Off	The module is not connected to the ATM network of the Catalyst 2900 series switches or another ATM device.

### SC Connector Description and Fiber-Optic Cabling Requirements

The ATM 155 SM-MR and SM-LR Fiber modules require an SC connector and fiber-optic cable as shown in Figure 1-6. The maximum distance for single-mode fiber-optic network connections is 15 kilometers for medium reach and 40 kilometers for long reach.

**Figure 1-6 SC Connector and Fiber-Optic Cable**

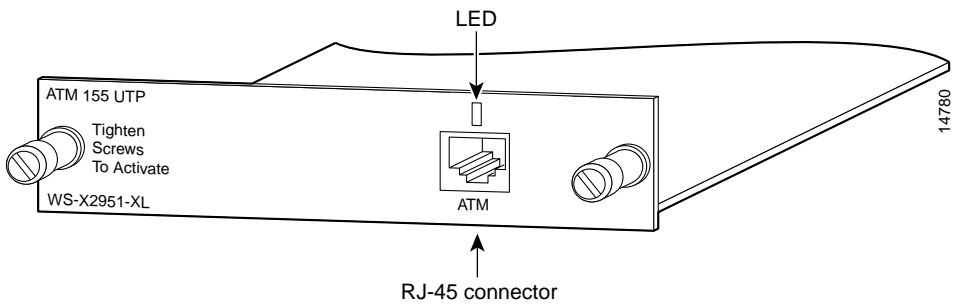


The module transmits data through the transmit (Tx) fiber-optic port and receives data from the receive (Rx) fiber-optic port. The fiber-optic port transmits on a 1300-nanometer wavelength.

# ATM 155 UTP Module

The ATM 155 UTP module (shown in Figure 1-7) has one LED indicator and one RJ-45 connector.

Figure 1-7      ATM 155 UTP Module



## LED Description

The indicator on the front panel of the ATM 155 UTP module illuminates in two colors to indicate the operating status of the module. The LED is described in Table 1-3.

Table 1-3      ATM 155 UTP Module LED Description

Color	Operating Status
Green	The module port is connected to an operational ATM switch at the remote end; it is steady when there is no activity.
Flashing green	The module is transmitting or receiving data. The LED flashes rapidly when the traffic level is high.
Amber	The module is disabled because it did one of the following: <ul style="list-style-type: none"><li>• Responded to an administrative action</li><li>• Encountered a secure address violation</li><li>• Failed the power-on self-test (POST)</li></ul>

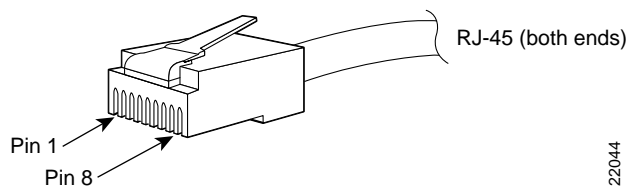
**Table 1-3          ATM 155 UTP Module LED Description (Continued)**

Color	Operating Status
Off	The module is not connected to the ATM network of the Catalyst 2900 series switches or another ATM device.

**RJ-45 Connector and Category 5 UTP Cabling Requirements**

The ATM 155 UTP module requires an RJ-45 connector and Category 5 UTP straight-through cable as shown in Figure 1-8. The maximum distance for UTP network connections is 328 feet (100 meters).

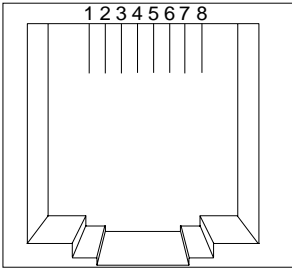
**Figure 1-8          RJ-45 Connector and Category 5 UTP Cable**



The RJ-45 connector shown in Figure 1-9 is on the ATM 155 UTP module front panel. The figure also lists the pin assignments.



Figure 1-9 RJ-45 Pin Assignments and Connector

Pin	Label	
1	TxD+	
2	TxD-	
3	NC	
4	NC	
5	NC	
6	NC	
7	RxD+	
8	RxD-	

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# Installing an ATM Module

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This chapter provides LAN emulation (LANE) configuration requirements, procedures for installing and removing the ATM modules from the Catalyst 2900 series switch, and troubleshooting information. It also provides packing list information, regulatory statements, and instructions for avoiding electrostatic discharge.

## Inspecting the Packing List

Before you install an ATM module, ensure that the following items are included in the package:

- Catalyst 2900 series XL ATM module
- Cisco Information Packet
- One CD-ROM containing the Flash image to upgrade the software for the Catalyst 2900 series switch and the corresponding documentation.

If anything is missing, contact your Cisco Systems customer service representative.

## EMC Regulatory Statements

This section lists international regulatory information for the ATM modules.

### U.S.A.

U.S. regulatory information for this product is in the front matter of this manual.

Taiwan

警告使用者：  
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻  
干擾，在這種情況下，使用者 會被要求採取某些適當的對策。

15456

LANE Configuration Requirements

Before you configure the LANE client, ensure that the device you are connecting to the ATM module is configured as one of the following LANE servers:

LANE broadcast-and-unknown server (BUS)	Multicast server that floods traffic addressed to an unknown destination in emulated LANs (ELANs). It also forwards multicast and broadcast traffic to the appropriate clients.
LANE configuration server (LECS)	Database server that assigns a LANE client to particular ELANs by directing them to the LANE server (LES) that corresponds to the ELAN. There is one logical LECS per administrative domain. This serves all ELANs within that domain.
LANE server (LES)	LANE server that implements the control function for a particular ELAN. There is only one logical LES per ELAN. It is identified by a unique ATM address.

After LESs are properly configured, you can connect the devices to the ATM module. Record the VLAN ID numbers and ELAN names that are configured in the LECS. You will need this information when you configure the ATM module LANE client.

---

For additional information about LANE, refer to the related Cisco publications listed in the section entitled “About This Guide.”

---

**Note** If your network supports more than one ELAN, a router is required as part of the network topology.

---

For detailed information about configuring LECSs, refer to your ATM device documentation.

---

**Note** The “Configuration Examples” appendix contains examples showing how to configure LANE servers and clients.

---

## Avoiding Electrostatic Discharge

Before you install the ATM module, ground yourself by touching a piece of metal to avoid electrostatic discharge (ESD). You should also take the following precautions to prevent damage to the board:

- Keep the module in its antistatic shielded bag until you are ready to install it.
- Handle the modules by the edges.
- Do not touch the components, pins, leads, or solder connections.

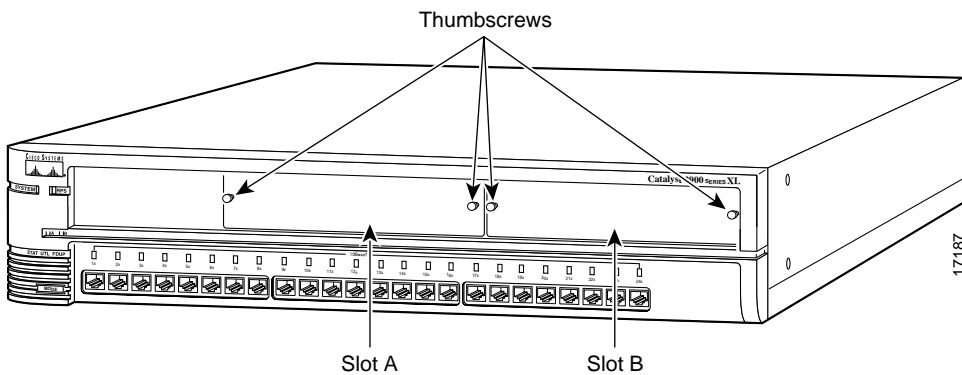
## Power-Up Considerations

After the ATM module is installed and the cables are connected, the module automatically runs a power-on self-test (POST) to verify that the ATM module is operational. This POST is specific to the ATM module. The Catalyst switch continues its normal operation.

# Installing the Module

Before you install the ATM module, select an expansion slot on the front panel of the switch. Figure 2-1 shows a Catalyst 2900 series switch with blank faceplates for expansion slot A and expansion slot B. If you are replacing an existing module, refer to the “Removing the Module” section before you begin.

**Figure 2-1 Catalyst 2900 Series XL with Blank Faceplates**



**Warning** Class 1 laser product.



**Warning** Avoid exposure to the laser beam.



**Caution** When installing an ATM MM Fiber or ATM SM Fiber module, do not remove the rubber plugs from the fiber-optic connector on the module or the rubber caps from the fiber-optic connector on the cable until you are ready to connect the cable to the module. The plugs and caps protect the fiber-optic connectors from contamination and ambient light.



**Caution** Before you install the ATM module, ground yourself by touching a piece of metal to avoid electrostatic discharge.

---

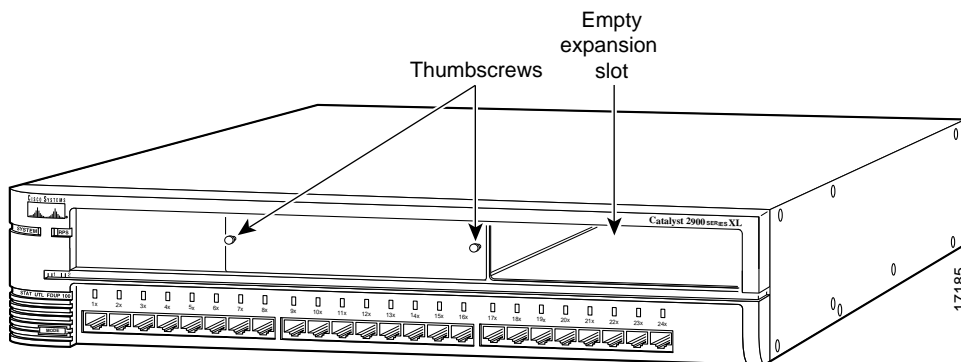
To install the module in an expansion slot, follow these steps:

**Step 1** Loosen the thumbscrews that secure the faceplate to the expansion slot.

**Step 2** Remove the faceplate and store it for later use.

Figure 2-2 shows a Catalyst 2900 series switch with an empty expansion slot.

**Figure 2-2 Catalyst 2900 Series Switch with an Empty Expansion Slot**



**Step 3** Align the sides of the module with the guide brackets along the inside of the chassis slot.



**Caution** Do not force the ATM module into the expansion slot. Doing so might damage the module and the switch.

**Step 4** Slide the ATM module into the expansion slot until it seats snugly into the connector on the switch backplane.

**Step 5** Tighten the thumbscrews on the front panel of the module.

The module is properly seated when the front panel is flush with the front panel of the switch.

# Connecting the Cables

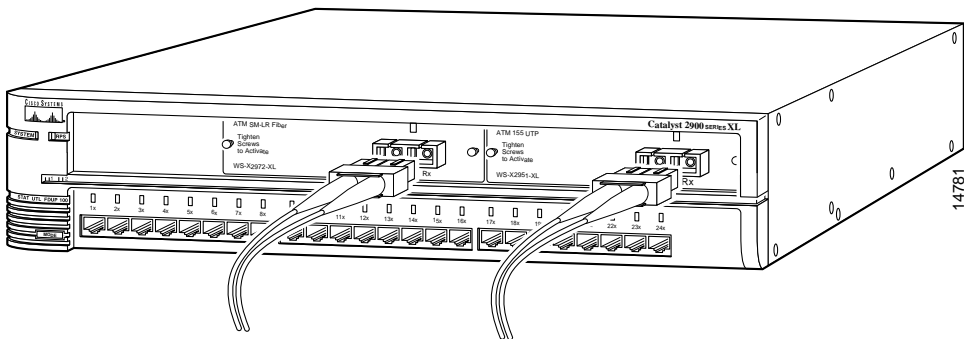
This section explains how to connect cables to installed ATM modules. Both fiber-optic and UTP cable connections are discussed.

## Fiber-Optic Cable

To connect a fiber-optic cable to the ATM 155 SM-MR or ATM 155 SM-LR module, do the following:

- Step 1** Remove the rubber plugs from the connector on the cable and store the plugs for future use.
- Step 2** Connect the cable to the connector on the ATM module, as shown in Figure 2-3.
- Step 3** Connect the other end of the fiber-optic cable to the remote ATM device.

**Figure 2-3** Connecting a Fiber-Optic Cable





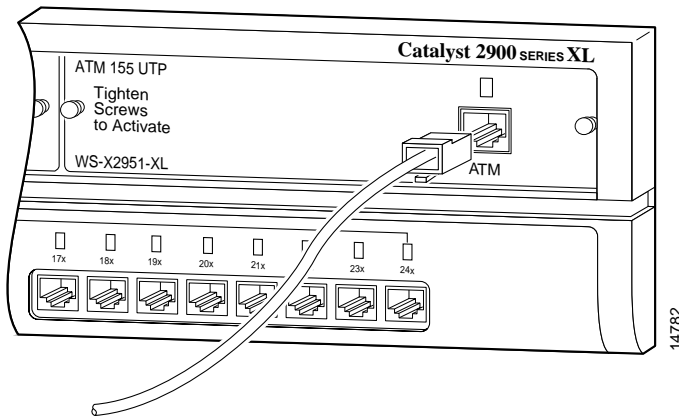
---

## UTP Cable

To connect a UTP Category 5 cable to the ATM 155 UTP module, do the following:

- Step 1** Connect the cable to the RJ-45 connector on the ATM module, as shown in Figure 2-4.
- Step 2** Connect the other end of the UTP cable to the remote ATM device.

**Figure 2-4 Connecting a Category 5 UTP Cable**



After the ATM module is installed and the cables are connected, the module automatically runs a POST to verify that it is operational. If the ATM module fails the POST, the LED on the module changes from green to amber. For more information about LED displays, refer to Table 1-1, Table 1-2, or Table 1-3. Refer to the section entitled “Troubleshooting” for troubleshooting procedures if the ATM module is not operational.

# Removing the Module

To remove an ATM module from a Catalyst 2900 series switch, follow these steps:

**Step 1** Disconnect the cable from the connector on the ATM module.

- If you are disconnecting a fiber-optic cable from the ATM 155 MM Fiber module or the ATM 155 SM Fiber module, press the locks on the cable connector together, and pull the cable from the module connector.



**Caution** Place the rubber plugs back into the fiber-optic connector on the module and the rubber caps on the fiber-optic connector on the cable. The plugs and caps protect the fiber-optic connectors from contamination and ambient light.

- If you are disconnecting a Category 5 UTP cable from the ATM 155 UTP module, press the lock on the bottom of the connector upward, and pull the cable from the connector on the module.

**Step 2** Loosen the thumbscrews that attach the ATM module to the front panel of the switch.

**Step 3** Remove the module from the switch by grasping the thumbscrews and gently pulling the module out of the slot.

**Step 4** If you are not installing another module, reinstall the blank faceplate over the open chassis slot to ensure proper airflow and cooling in the chassis.

**Step 5** Tighten the faceplate thumbscrews.

# Configuring the ATM Module

---

This chapter provides procedures for configuring the ATM module. The procedures include configuring the ATM LAN emulation (LANE) client (LEC) from the command-line interface (CLI) and verifying the configuration. Additionally, this chapter explains how to manually configure the ATM module to support RFC 1483. For information about the trunking and nontrunking features, see the *Catalyst 2900 Series XL Enterprise Edition Software Configuration Guide*. For detailed information about commands used in this chapter, see the “Command Reference” appendix.

## Accessing the Command-Line Interface

You can enter Cisco IOS commands to configure the LEC software on the ATM module. To start an ATM session, enter the **session** *session-number* command at the switch prompt in privileged EXEC mode.

```
switch# session 1

ATM>Entering Console for module in slot 1
Type  "^G" to end this session

Press RETURN to get started!

ATM>
```

If the ATM module is installed in Slot A, the session displays interface 1; if the module is installed in Slot B, the session displays interface 2.

# Configuring the LEC

This section explains how to configure the ATM module LEC from the CLI at the Catalyst 2900 series switch management console. The ATM module does not forward any frames from the switch until you define LEC. Once you define a LEC with an ELAN mapped to a VLAN, the ATM module forwards the traffic to the appropriate ELAN.

Before you configure the LEC, ensure that the LES is configured. Refer to the “LANE Configuration Requirements” section in the “Installing an ATM Module” chapter.

Configuring the LEC specifies the ELAN in the ATM network to which your LAN is connected.

Table 3-1 lists the Cisco IOS commands used to configure (and verify) the LEC.

**Table 3-1 Cisco IOS Commands for LEC**

Command	Value	Description
<b>enable</b>		Enters EXEC mode.
<b>configure terminal</b>		Enters global configuration mode.
<b>interface</b>	<i>type_number.subif multipoint</i>	Enters interface configuration mode.
<b>lane client ethernet</b>	<i>vlan_number elan_name</i>	Configures LEC.
<b>show interface</b>		Verifies that the ATM is connected to the network. Displays the operational state of the ATM interface and the rate at which packets are transferred.
<b>show lane</b>		Verifies that the LEC is operational. Also shows the ATM network service access point (NSAP) address of the LANE configuration.
<b>write memory</b>		Saves the configuration to nonvolatile random-access memory (NVRAM).

---

In the configuration procedure example that follows, the following information applies:

- The ATM module is installed in Slot A (interface 1).
- The VLAN ID number is 1.
- The ELAN name is *marketing*.

To configure the LEC from the CLI, follow these steps:

**Step 1** Enter privileged EXEC mode by entering the **enable** command:

```
ATM> enable
ATM#
```

**Step 2** Enter global configuration mode by entering the **configure terminal** command:

```
ATM# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ATM(config)#
```

**Step 3** Enter interface configuration mode by entering the **interface** *type\_number.subif* **multipoint** command:

```
ATM(config)# interface atml.1 multipoint
ATM(config-if)#
```

**Step 4** Configure the LEC by entering the **lane client ethernet** *vlan\_number* *elan\_name* command:

```
ATM(config-if)# lane client ethernet 1 marketing
ATM(config-if)#
```

**Step 5** Exit interface configuration mode and return to EXEC mode by pressing **Ctrl-Z**:

```
ATM(config-if)# ^Z
ATM#
```

**Step 6** (Optional) From EXEC mode, save the configuration to nonvolatile random-access memory (NVRAM) by entering the **write memory** command:

```
ATM# write memory
ATM#
```

This step saves the commands you used in Steps 1 through 5 in the NVRAM file. You can use this file the next time you access the module.

When you have configured the LEC, the ATM module is ready to transmit and receive data between your LAN and the ATM network.

## Verifying the LEC Configuration

After the LEC is configured, you can verify that the configuration is complete. This section tells you how to verify the ATM and LANE status and view the port statistics for the LEC.

### Verifying ATM and LANE Status

You can verify the ATM and LANE status by using the **show lane** command.

#### Using the show lane command

The **show lane** command verifies that the LEC is operational and shows the ATM NSAP addresses of the LANE configuration.

To verify ATM and LANE status from the CLI, enter the **show lane EXEC** command:

```
ATM> show lane
LE Client ATM1.1 ELAN name: marketing Admin: up State: operational
Client ID: 2 LEC up for 6 minutes 14 seconds
Join Attempt: 2
HW Address: 00c0.1dfc.a2fc Type: ethernet Max Frame Size: 1516
VLANID: 1
ATM Address: 39.0000000000000000000000000000.00C01DFCA2FC.00

VCD  rxFrames  txFrames  Type      ATM Address
0      0          0  configure 39.0000000000000000000000000000.00605C28DA23.00
4      0          2  direct   39.0000000000000000000000000000.00605C28DA21.01
5      0          0  distribute 39.0000000000000000000000000000.00605C28DA21.01
6      0         20  send      39.0000000000000000000000000000.00605C28DA22.01
13     0          0  forward   39.0000000000000000000000000000.00605C28DA22.01
8      58         55  data      39.0000000000000000000000000000.00605C28DA20.01
```

ATM>

---

## Verifying ATM Port Statistics

The port statistics verify that the ATM module is transmitting and receiving data across the ATM network. For example, the display shows the number of ATM Adaptation Layer 5 (AAL5) frames and ATM cells transmitted and received. You can verify ATM port statistics by using the **show interface** command.

### Using the show interface command

The **show interface** command verifies that the ATM port is connected to the network by displaying information such as the operational state of the ATM interface and the rate at which packets are transferred.

To verify ATM port statistics from the CLI, do the following:

**Step 1** Enter the **enable** EXEC command:

```
ATM> enable
ATM#
```

### Step 2 Enter the **show interface EXEC** command:

```
ATM# show interface
ATM1 is up, line protocol is up
  Hardware is Catalyst 2900 ATM
  Internet address is 199.90.198.195
  MTU 1500 bytes, sub MTU 1500, BW 156250 Kbit, DLY 100 usec, rely
    255/255, load
  1/255
  Encapsulation ATM, loopback not set, keepalive set (10 sec)
  Encapsulation(s): AAL5, PVC mode
  1024 maximum active VCs, 1024 VCs per VP, 22 current VCCs
  VC idle disconnect time: 300 seconds
  Signalling vc = 1, vpi = 0, vci = 5
  UNI Version = 3.1, Link Side = user
  Last input 00:00:07, output never, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 3000 bits/sec, 3 packets/sec
  5 minute output rate 2000 bits/sec, 3 packets/sec
    82111 packets input, 10186865 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    82152 packets output, 10176265 bytes, 0 underruns
    0 output errors, 0 collisions, 3 interface resets
    0 output buffer failures, 0 output buffers swapped out
ATM1.1 is up, line protocol is up
  Hardware is Catalyst 2900 ATM
  MTU 1500 bytes, BW 156250 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ATM-LANE
  ARP type: ARPA, ARP Timeout 04:00:00

ATM#
```

## Configuring Support for RFC-1483 PVC

You must manually configure the ATM module to support RFC-1483 logical link control (LLC) encapsulation. By using RFC 1483, you can transport Ethernet frames over permanent virtual connections (PVCs). You can create a PVC for RFC-1483 LLC encapsulation support.



---

For RFC-1483 LLC encapsulation, you must bind PVCs to the VLAN, and the VLAN ID must match the VLAN used on the switch. Each ATM trunk supports a maximum of 64 active VLANs at one time. You can logically group users on Ethernet and ATM networks by mapping VLANs on the Ethernet network to PVCs on the ATM network.

---

**Note** Only the LLC encapsulation for a bridged Ethernet/802.3 packet is supported.

---

## Using LECs

You cannot create both LECs and RFC-1483 PVCs on an ATM module. If you want to create a LEC after an RFC-1483 PVC has been configured, you must first remove all PVCs. Use the CLI command **no pvc vcd** to remove all RFC-1483 PVCs. Then use the CLI command **lane client ethernet** to create a LEC.

## Using RFC-1483 PVCs

If you create an RFC-1483 PVC, you cannot create a LEC on the ATM module. If you want to create an RFC-1483 PVC after a LEC is configured, you must first remove all existing LECs. Use the CLI command **no lane client ethernet** to remove LECs. After you create a PVC, you must bind it to the VLAN. For more information on binding the PVC, refer to the following section, “Configuration Example for RFC-1483 PVC.” A detailed example with a Cisco router and an LS1010 ATM switch is discussed in the “Configuration Examples” appendix.

### Configuration Example for RFC-1483 PVC

The following example shows how to manually configure the ATM module to support an RFC-1483 PVC:

---

**Note** The example assumes that VLAN1 is on interface atm1.1, and VLAN2 is on interface atm1.2. It also assumes that PVC100 and PVC101 are bound to VLAN 1 and PVC200 is bound to VLAN 2.

---

**Step 1** Enter the privileged EXEC mode by entering the **enable** command:

```
atm> enable
atm#
```

**Step 2** Enter global configuration mode by entering the **configure terminal** command:

```
atm# configure terminal
atm(config-if)#
```

**Step 3** Enter interface configuration mode by entering the **int atm1** command:

```
atm(config-if)# int atm1
```

**Step 4** Create PVCs for RFC 1483 by entering the **atm pvc** command:

```
atm(config-if)# atm pvc 100 1 100 aal15snap 20000 20000 32
atm(config-if)# atm pvc 101 1 101 aal15snap
atm(config-if)# atm pvc 200 1 200 aal15snap
```

**Step 5** Change the subinterface from atm1.1 to atm1.2 by entering the **int atm1.2 multipoint** command:

```
atm(config-if)# int atm1.2 multipoint
atm(config-subif)#
```

**Step 6** Bind the VLAN to PVCs by entering the **atm bind** command:

```
atm(config-subif)# atm bind pvc vlan 100 1
atm(config-subif)# atm bind pvc vlan 101 1
```

---

**Step 7** Change subinterface from atm1.1 to atm1.2 by entering the **int atm1.2 multipoint** command:

```
atm(config-subif)# int atm 1.2 multipoint
```

**Step 8** Bind the VLAN to PVCs by entering the **atm bind** command:

```
atm(config-subif)# atm bind pvc vlan 200 2
```

**Step 9** Exit the configuration mode by pressing **Ctrl-Z**:

```
ATM(config-if)# ^Z  
ATM#
```

For a detailed configuration example, refer to the “Configuration Examples” appendix.



# Troubleshooting

---

This chapter provides the following information for troubleshooting problems.

- Understanding POST results
- Recovering from corrupted software
- Recovering from a lost or forgotten password
- Upgrading Software

## Understanding POST Results

When an ATM module is installed in a Catalyst 2900 series switch that is powered on, the expansion slot LED on the switch and the LED on the ATM module are green, and the module POST starts automatically. If the ATM module passes the POST, the expansion slot LED remains green; if the module fails, the LED turns amber. The “Physical Description” section of the “Overview” chapter describes how to use the module LEDs to interpret the POST failures for the ATM module.

If the module LED does not illuminate, use Table 4-1 to determine the appropriate corrective action.

**Table 4-1      Troubleshooting the ATM Module Installation**

Symptom	Possible Cause	Corrective Action
Module LED is off.	No cable connected.	Connect both ends of a cable to a device.
	Device has no power.	Ensure that both devices have power.

Table 4-1 Troubleshooting the ATM Module Installation (Continued)

Symptom	Possible Cause	Corrective Action
	Wrong cable type.	Verify the cable type. The ATM 155 MM Fiber module typically uses an orange fiber-optic cable and the ATM 155 SM Fiber module typically uses a yellow fiber-optic cable; the ATM 155 UTP module uses Category 5 UTP cable.
	Bad cable.	Replace with known good cable.
Switch expansion slot LED is off.	Module not installed properly.	Remove module and reinstall.

# Recovering from Corrupted Software

Module software can be corrupted. If the software is corrupted, the module does not pass POST, and there is no connectivity. Use the following procedure to recover from a corrupt or wrong image file:

**Step 1** At the switch prompt, change to privileged EXEC mode by entering the **enable** command:

```
Switch> enable
```

**Step 2** Enter the switch password, if applicable.

```
Password: <password>
Switch#
```

**Step 3** Enter the **copy** command to copy the image.

```
Switch# copy tftp://server//filename slot1:boot
```

If this command is successful, go to the next step. Otherwise, skip Step 4 and go to Step 5.

**Step 4** Restart the module using the following command:

```
Switch# hw-module 1 restart
```

---

If this Step is successful, the remaining Steps are not necessary. Otherwise, go to Step 5.

**Step 5** (Optional) If Steps 1 through 4 did not provide successful results, enter the following command to ensure that the defective IOS image does not come up:

```
Switch# hw-module 1 maint
```

Using this command allows you to bypass the IOS image and connect to the module through the boot loader when you restart the module.

**Step 6** Restart the module using the following command:

```
Switch# hw-module 1 restart
```

**Step 7** (Optional) Enter the **copy** command to copy the image.

```
Switch# copy tftp://server//filename slot1:boot
```

**Step 8** (Optional) Restart the module by entering the following command:

```
Switch# hw-module 1 restart
```

**Step 9** If there is still a problem, do one of the following:

- Restart the switch by entering the **reload** command.

```
Switch> reload
```

- Ensure that there is enough space available on the module by entering the **dir** command.

```
Switch> dir slot1
```

```
Switch> dir slot2
```

# Recovering from a Lost or Forgotten Password

Follow the steps in this procedure if you have forgotten or lost the module password.

- Step 1** At the switch prompt, change to privileged EXEC mode by entering the **enable** command:

```
Switch> enable
```

- Step 2** Enter the switch password, if applicable.

```
Password: <password>  
Switch#
```

- Step 3** Rename the configuration file as shown in the following example:

```
Switch# rename slot1:config.text slot1:config.text.old  
  
Switch# rename slot2:config.text slot2:config.text.old
```

- Step 4** Restart the switch and module by entering the following command at the switch prompt:

```
Switch# reload
```

- Step 5** At the switch prompt, change to privileged EXEC mode by entering the **enable** command:

```
Switch> enable
```

- Step 6** Enter the switch password, if applicable.

```
Password: <password>  
Switch#
```

- Step 7** Start a session on the module:

```
Switch# session  
ATM#
```



- 
- Step 8** At the module prompt, change to configuration mode by entering the **configure terminal** command.

```
ATM# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ATM(config)#
```

- Step 9** Rename the configuration file to its original name by entering the **rename** command:

```
ATM# rename flash:config.text.old flash:config.text
```

- Step 10** Copy the configuration file into memory with the **copy** command:

```
ATM# copy flash:config.text system:running-config
Source filename [config.text]?
Destination filename [running-config]?
ATM(config)#
```

Press **Return** in response to the confirmation prompts. The configuration file is now reloaded, and you can use the normal commands to change the password.

- Step 11** Enter the enable password command to change the password:

```
ATM(config)# enable <password string>
ATM#
```

(where *string* is the password)

- Step 12** Exit configuration mode by using the **end** command.

```
ATM# end
```

- Step 13** Enter the **write mem** command to save the configuration.

```
ATM# write mem
```

The new password is now included in the startup configuration.

## Upgrading the Module Software

New ATM module software releases can be downloaded from Cisco Connection Online, the Cisco Systems customer web site.

### Downloading Files from CCO

Follow these steps to download the new software and TFTP server application:

- Step 1** Display the Cisco home page by pointing your browser to one of the following URLs:
- <http://www.cisco.com>
- <http://www-china.cisco.com>
- <http://www-europe.cisco.com>.
- Step 2** Log into CCO. You might need to register the first time you log in.
- Step 3** To locate the software files from the home page, select **Service and Support > Software Center > Cisco IOS Software > Cisco IOS 12.0 > 2900atm**.
- Step 4** Follow the instructions on the page to download the IOS image.
- Step 5** Follow the instructions on the page to download and configure the TFTP server.

### Displaying the IP Address of the TFTP Server

Before you can download new software to your module, you need to enter the IP address of your PC or workstation on the System Management page. If you are running the Cisco TFTP server, the PC IP address is displayed on the application title bar.

If you do not know the IP address, follow these steps to display it:

- For a Windows NT system, enter the command **ipconfig** at the DOS prompt.
- For a Windows 95 system, enter the command **winipcfg** from the Windows **Start > Run** menu.
- From a UNIX workstation, enter **ifconfig -a** or look at the `/etc/hosts` file.

---

## Upgrading the Software Using the CLI

Follow these steps to upgrade the module software:

- Step 1** At the switch prompt, change to privileged EXEC mode by entering the **enable** command:

```
Switch> enable
```

- Step 2** Enter the switch password, if applicable.

```
Password: <password>
Switch#
```

- Step 3** Enter the **copy** command to copy the image in slot 1 or slot 2.

```
Switch# copy tftp://server//filename slot1:boot
```

```
Switch# copy tftp://server//filename slot2:boot
```

---

**Note** When copying the image, Cisco recommends that you overwrite the old file. This decreases potential problems in the future when you restart the module. When the module restarts, it uses the first image it finds.

---

- Step 4** Restart the switch using the **reload** command:

```
Switch# reload
```

## Upgrading the Software Using CVSM

To upgrade the module software using CVSM, do the following from the CVSM System Configuration page:

---

**Note** To avoid errors during the upgrade process, close all other CVSM pages.

---

- Step 1** In the **Combined Cisco IOS and Visual Switch Manager Upgrade** section, enter the IP address of your TFTP server into the **Server IP Address** or **Name of TFTP Server** field.

## Upgrading the Module Software

---

**Step 2** In the **Cisco ATM Upgrade Filename** field, enter the name of the image file that you downloaded from CCO.

This might be a name like C29atm-m-m-120-2.bin. Do not enter the path.

**Step 3** Click **Upgrade ATM Module on Slot 1** or **Upgrade ATM Module on Slot 2**.

The upgrade can take several minutes. The TFTP server window displays a successful message when the upgrade is complete.

**Step 4** Click **Reboot System** to restart the switch.

# Technical Specifications

This appendix provides the technical specifications and regulatory agency approvals for the ATM modules (as listed in Table A-1 and Table A-2).

## ATM 155 MM Fiber and ATM 155 UTP Modules

Table A-1 lists the technical specifications and regulatory agency approvals for the ATM 155 MM Fiber and ATM 155 UTP modules.

Table A-1      Technical Specifications

Specification	ATM 155 MM Fiber Module	ATM 155 UTP Module
Environmental Ranges		
Operating temperature	32 to 122°F (0 to 50°C)	32 to 122°F (0 to 50°C)
Storage temperature	−4 to 149°F (−20 to 65°C)	−4 to 149°F (−20 to 65°C)
Operating humidity	10 to 85% (noncondensing)	10 to 85% (noncondensing)
Storage humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Operating altitude	Up to 10,000 ft (3000 m)	Up to 10,000 ft (3000 m)
Storage altitude	Up to 15,000 ft (4570 m)	Up to 15,000 ft (4570 m)
Power Consumption	17.5W	17.5W
Physical Dimensions		
Dimensions (H x W x D)	1.22 x 6.01 x 10.68 in. (3.10 x 15.27 x 27.13 cm)	1.22 x 6.01 x 10.68 in. (3.10 x 15.27 x 27.13 cm)
Weight	1 lb (0.45 kg)	1 lb (0.45 kg)

---

**Table A-1      Technical Specifications (Continued)**

<b>Specification</b>	<b>ATM 155 MM Fiber Module</b>	<b>ATM 155 UTP Module</b>
<b>Agency Approvals</b>		
<b>EMI</b>		
	FCC Class A	FCC Class A
	VCCI Class A	VCCI Class A
	EN 55022 Class A	EN 55022 Class A
	AS/NZS 3548 Class A	AS/NZS 3548 Class A
	EN 50082-1	EN 50082-1

## ATM 155 SM Fiber Modules

Table A-2 lists the technical specifications and regulatory agency approvals for the ATM 155 MM Fiber SM Fiber modules.

**Table A-2      Technical Specifications**

<b>Specification</b>	<b>ATM 155 SM-MR Fiber Module</b>	<b>ATM 155 SM-LR Fiber Module</b>
<b>Environmental Ranges</b>		
Operating temperature	32 to 122°F (0 to 50°C)	32 to 122°F (0 to 50°C)
Storage temperature	–4 to 149°F (–20 to 65°C)	–4 to 149°F (–20 to 65°C)
Operating humidity	10 to 85% (noncondensing)	10 to 85% (noncondensing)
Storage humidity	5 to 95% (noncondensing)	5 to 95% (noncondensing)
Operating altitude	Up to 10,000 ft (3000 m)	Up to 10,000 ft (3000 m)
Storage altitude	Up to 15,000 ft (4570 m)	Up to 15,000 ft (4570 m)
<b>Power Consumption</b>	18.5W	19.0W
<b>Physical Dimensions</b>		
Dimensions (H x W x D)	1.22 x 6.01 x 10.68 in. (3.10 x 15.27 x 27.13 cm)	1.22 x 6.01 x 10.68 in. (3.10 x 15.27 x 27.13 cm)

**Table A-2      Technical Specifications (Continued)**

<b>Specification</b>	<b>ATM 155 SM-MR Fiber Module</b>	<b>ATM 155 SM-LR Fiber Module</b>
Weight	1 lb (0.45 kg)	1 lb (0.45 kg)
<b>Agency Approvals</b>		
<b>EMI</b>		
	FCC Class A	FCC Class A
	VCCI Class A	VCCI Class A
	EN 55022 Class A	EN 55022 Class A
	AS/NZS 3548 Class A	AS/NZS 3548 Class A
	EN 50082-1	EN 50082-1





# Command Reference

---

This appendix provides a reference to the Cisco IOS commands used by the ATM modules.

A detailed description of the commands specific to the ATM modules is provided in the “ATM Module Commands” section. Core commands the ATM module uses are listed in Table B-2 in the “Supported Cisco IOS Commands” section.

A description of the command-line interface (CLI) command modes is also included.

## CLI Command Modes

This section describes the CLI command mode structure. Command modes support specific Cisco IOS commands. For example, the **interface** *type\_number* command works only when entered in global configuration mode. The Cisco IOS command modes are as follows:

- User EXEC mode
- Privileged EXEC mode
- Global configuration mode
- Interface configuration mode
- Line configuration mode

Table B-1 lists the command modes, how to access each mode, the prompt you will see in that mode, and how to exit that mode. The prompts listed assume the default name ATM.

Table B-1            Command Modes Summary

Command Mode	Access Method	Prompt	Exit Method
User EXEC	Begin a session with the ATM module.	ATM>	Enter the <b>logout</b> command.
Privileged EXEC	From user EXEC mode, enter the <b>enable</b> EXEC command.	ATM#	To exit to user EXEC mode, enter the <b>disable</b> command.  To enter global configuration mode, enter the <b>configure</b> command.
Global configuration	From privileged EXEC mode, enter the <b>configure</b> privileged EXEC command.	ATM (config)#	To exit to privileged EXEC mode, enter the <b>exit</b> or <b>end</b> command, or press <b>Ctrl-Z</b> .  To enter interface configuration mode, enter the <b>interface</b> configuration command.
Interface configuration	From global configuration mode, specify an interface by entering the <b>interface</b> command.	ATM (config-if)#	To exit to global configuration mode, enter the <b>end</b> command.  To exit to privileged EXEC mode, enter the <b>exit</b> command, or press <b>Ctrl-Z</b> .  To enter subinterface configuration mode, specify a subinterface with the <b>interface</b> command. On the ATM module, the LANE client is considered a subinterface.

**Table B-1            Command Modes Summary (Continued)**

<b>Command Mode</b>	<b>Access Method</b>	<b>Prompt</b>	<b>Exit Method</b>
Line configuration	From global configuration mode, specify a line by entering the <b>line</b> command.	ATM (config-line)#	To exit to global configuration mode, enter the <b>exit</b> command.  To return to privileged EXEC mode, enter the <b>end</b> command, or press <b>Ctrl-Z</b> .

## User EXEC Mode

After you access the ATM module, you are automatically in user EXEC command mode. The EXEC commands available at the user level are a subset of those available at the privileged level. In general, the user EXEC commands allow you to change terminal settings temporarily, perform basic tests, and list system information.

The list of user EXEC commands displayed in the following example is a subset of the supported commands. The supported commands can vary, depending on the version of IOS Software in use. To view a comprehensive list of commands, enter a question mark (?) at the prompt.

```
ATM> ?
Exec commands:
  clear          Reset functions
  disable       Turn off privileged commands
  enable        Turn on privileged commands
  exit          Exit from the EXEC
  help          Description of the interactive help system
  login         Log in as a particular user
  logout        Exit from the EXEC
  show          Show running system information
  terminal      Set terminal line parameters

ATM>
```

# Privileged EXEC Mode

Because many of the privileged commands configure operating parameters, privileged access should be password-protected to prevent unauthorized use. The privileged command set includes those commands contained in user EXEC mode, as well as the **configure** command through which you access the remaining command modes.

If your system administrator has set a password, you are prompted to enter it before being granted access to privileged EXEC mode. The password is not displayed on the screen and is case sensitive.

The privileged EXEC mode prompt is as follows:

```
ATM#
```

Enter the **enable** command to access privileged EXEC mode:

```
ATM> enable
ATM#
```

The list of privileged EXEC commands displayed in the following example is a subset of the supported commands. The supported commands can vary, depending on the version of IOS software in use. To view a comprehensive list of commands, enter a question mark (?) at the prompt.

```
ATM# ?
Exec commands:
  clear          Reset functions
  configure      Enter configuration mode
  debug          Debugging functions (see also 'undebug')
  disable        Turn off privileged commands
  enable         Turn on privileged commands
  exit           Exit from the EXEC
  help           Description of the interactive help system
  login          Log in as a particular user
  logout         Exit from the EXEC
  reload         Halt and perform a cold restart
  show           Show running system information
  terminal       Set terminal line parameters
  write          Write running configuration to memory, network, or
                terminal

ATM#
```

---

To return from privileged EXEC mode to user EXEC mode, enter the **disable** command.

## Global Configuration Mode

Global configuration commands apply to features that affect the ATM module as a whole. Use the **configure** privileged EXEC command to enter global configuration mode. The default is to enter commands from the management console.

When you enter the **configure** command, the console prompts you for the source of the configuration commands:

```
ATM# configure
Configuring from terminal, memory, or network [terminal]?
```

You can specify either the terminal or NVRAM as the source of configuration commands.

The following example shows you how to access global configuration mode:

```
ATM# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

The list of global configuration commands displayed in the following example is a subset of the supported commands. The supported commands can vary depending on the version of IOS software in use. To view a comprehensive list of commands, enter a question mark (?) at the prompt.

```
ATM(config)# ?
Configure commands:
  alias                Create command alias
  default              Set a command to its defaults
  enable              Modify enable password parameters
  end                  Exit from configure mode
  exit                 Exit from configure mode
  help                 Description of the interactive help system
  hostname             Set system's network name
  interface            Select an interface to configure
  line                 Configure a terminal line
  no                   Negate a command or set its defaults
  privilege            Command privilege parameters
  username             Establish User Name Authentication
.
ATM(config)#
```

To exit global configuration command mode and return to privileged EXEC mode, enter the **end** or **exit** command, or press **Ctrl-Z**.

## Interface Configuration Mode

Interface configuration commands modify the operation of the ATM interface. Interface configuration commands always follow an interface global configuration command, which defines the interface type.

Use the **interface *type\_number.subif*** command to access interface configuration mode. In the following example, ATM interface 1 is about to be configured. The new prompt, `ATM(config-if)#`, indicates interface configuration mode.

---

**Note** One (1) is the interface number for Slot A, and 2 is the interface number for Slot B.

---

---

The following example shows you how to access interface configuration mode:

```
ATM(config)# int atm1.1 multipoint
```

The list of interface configuration commands displayed in the following example is a subset of the supported commands. The supported commands can vary, depending on the version of IOS software in use. To view a comprehensive list of commands, enter a question mark (?) at the prompt.

```
ATM(config-subif)# ?
Interface configuration commands:
  atm          Modify ATM parameters
  default      Set a command to its defaults
  description   Interface specific description
  exit         Exit from interface configuration mode
  lane         Modify LANE parameters
  mtu          Set the interface Maximum Transmission Unit (MTU)
  no           Negate a command or set its defaults
  shutdown     Shutdown the selected interface

ATM(config-if)#
```

To exit interface configuration mode and return to global configuration mode, enter the **exit** command. To exit interface configuration mode and return to privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**.

## Line Configuration Mode

Line configuration commands modify the operation of a terminal line. Line configuration commands always follow a line command, which defines a line number. These commands are used to change terminal parameter settings line-by-line or a range of lines.

Use the **line vty line\_number [ending\_line\_number]** command to enter line configuration mode. The new prompt, `ATM(config-line)#`, indicates line configuration mode. The following example shows how to enter line configuration mode for virtual terminal line 7:

```
ATM(config)# line vty 0 7
```

The list of line configuration commands displayed in the following example is a subset of the supported commands. The supported commands can vary, depending on the version of IOS software in use. To view a comprehensive list of commands, enter a question mark (?)

at the prompt.

```
ATM(config-line)# ?
Line configuration commands:
  autocommand           Automatically execute an EXEC command
  editing               Enable command line editing
  escape-character      Change the current line's escape character
  exec-banner           Enable the display of the EXEC banner
  exec-timeout          Set the EXEC timeout
  exit                 Exit from line configuration mode
  full-help             Provide help to unprivileged user
  help                 Description of the interactive help system
  history               Enable and control the command historyfunction
  length                Set number of lines on a screen
  location              Enter terminal location description
  logging               Modify message logging facilities
  login                Enable password checking
  monitor               Copy debug output to the current terminal line
  motd-banner           Enable the display of the MOTD banner
  no                   Negate a command or set its defaults
  notify                Inform users of output from concurrentsessions
  padding               Set padding for a specified output character
  password              Set a password
  privilege             Change privilege level for line
  refuse-message        Define a refuse banner
  session-timeout       Set interval for closing connection when there
                        is no input traffic
  terminal-type         Set the terminal type
  vacant-message        Define a vacant banner
  width                 Set width of the display terminal

ATM(config-line)#
```

To exit line configuration mode and return to global configuration mode, use the **exit** command. To exit line configuration mode and return to privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**.



---

## ATM Module Commands

The Cisco IOS software commands in this section are specific to the ATM module.

### atm bind

Use the **atm bind** interface configuration command to bind a PVC to a VLAN. Use the **no** form of this command to remove the bind.

**atm bind pvc vlan** *vc\_no vlan\_id*

**no atm bind pvc vlan** *vc\_no vlan\_id*

#### Syntax Description

<i>vc_no</i>	Virtual circuit descriptor, a unique number for each switch that identifies which virtual path identifier/virtual channel identifier (VPI/VCI) to use for a particular packet.
<i>vlan_id</i>	Number of the VLAN.

#### Default

None

#### Command Mode

Interface configuration

#### Usage Guideline

You can bind any number of PVCs to the same VLAN. To prevent loops, ensure that each PVC uniquely connects a VLAN group between two Catalyst 2900 series switches.

### Example

The following example shows how to bind PVC 10 to VLAN 5 and PVC 11 to VLAN 5:

```
ATM(config-if)# atm bind pvc vlan 10 5
ATM(config-if)# atm bind pvc vlan 11 5
```

### Related Commands

**show atm vlan**

**show atm vc**

---

## atm pvc

Use the **atm pvc** interface configuration command to enable the new encapsulation type, AAL5 SNAP, to support RFC-1483. You can specify the traffic-shaping parameters (such as peak rate in kbps, average rate in kbps, and burst-in cell rates) on a permanent virtual circuit (PVC). If you do not specify the traffic-shaping parameters, the default parameters are used. The default value for the peak bandwidth and average bandwidth is the line rate (155 Mbps), and burst cell rate is 4. Use the **no** form of this command to remove PVCs.

**atm pvc** *vc\_no vpi vci encaps* [**Peak Average** [**Burst**]][**OAM** *time\_in\_seconds*]

**no atm pvc** *vc\_no vpi vci encaps* [**Peak Average** [**Burst**]][**OAM** *time\_in\_seconds*]

### Syntax Description

<i>vc_no</i>	Number of the virtual channel descriptor (VCD).
<i>vpi</i>	ATM network virtual path identifier (VPI) of this PVC. This value must be 0.  The VPI is an 8-bit field in the header of the ATM cell. The VPI value is unique only on a single link, not throughout the ATM network (it has local significance only). The <i>vpi</i> value must match that of the switch.
<i>vci</i>	ATM network virtual channel identifier (VCI) of this PVC, ranging from 1 to 1023. The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single link, not throughout the ATM network (it has local significance only).

<i>encaps</i>	<p>ATM adaptation layer (AAL) and encapsulation type. Possible values are as follows:</p> <ul style="list-style-type: none"><li>• <i>aal5snap</i>—Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram. This is the only encapsulation supported for RFC-1483 LLC encapsulation.</li><li>• <i>ilmi</i>—Used to set up communication with the ILMI; the associated <i>vpi</i> and <i>vci</i> values are ordinarily 0 and 16, respectively.</li><li>• <i>qsaal</i>—A signaling-type PVC used for setting up or tearing down SVCs; the associated <i>vpi</i> and <i>vci</i> values are ordinarily 0 and 5, respectively.</li></ul>
<b>Peak</b>	Maximum rate (in kbps) at which this virtual circuit can transmit. Valid values range from 130 kbps to 155,000 kbps. If you set this value, you must also specify the average (burst is optional) value.
<b>Average</b>	Average rate (in kbps) at which this virtual circuit transmits. Valid values are 130 kbps to 155,000 kbps. If you set this value, you must also specify the peak (burst is optional) value.
<b>Burst</b>	Value that relates to the maximum number of ATM cells the virtual circuit can transmit to the network at the peak rate of the PVC. On the ATM module, burst can range from 1 to 32 cells.
<b>OAM</b>	Specifies how often to generate an OAM F5 loopback cell from this virtual circuit.
<i>time_in_seconds</i>	The OAM value. The default value is 10 seconds.

### Default

If peak and average rates are omitted, the PVC defaults to the highest bandwidth rate queue available. Peak and average rates are then equal. By default, the virtual circuit is configured to run as fast as possible.

If the **OAM** keyword is omitted, OAM cells are not generated. If the **OAM** keyword is present but the *time-in seconds* value is omitted, the default value is 10 seconds.

---

## Command Mode

### Interface configuration

## Examples

The following example creates a PVC with VPI 0 and VC 100. The PVC uses RFC-1483 LLC encapsulation.

```
ATM(config-if)# atm pvc 100 0 100 aa5snap
```

The following example creates a PVC to be used for ATM signaling for an SVC. It specifies VPI 0 and VCI 5.

```
ATM(config-if)# atm pvc 1 0 5 qsaal
```

## Related Commands

**show atm interface atm**

**show atm vc**

### show atm vlan

Use the **show atm vlan** privileged EXEC command to show the relationship between the VLAN and the PVCs.

**show atm vlan** *vlan\_id*

#### Syntax Description

*vlan\_id* (Optional) Specifies the VLAN number.

#### Default

None

#### Command Mode

Privileged EXEC

#### Usage Guideline

If *vlan\_id* is not specified, all active VLAN-to-PVC bindings are displayed.

#### Example

After entering the **show atm vlan** command, you see the following display:

```
ATM# show atm vlan
VCD      VLAN-ID
10       5
11       5
ATM#
```

The display shows the VCD of the VC and the VLAN-ID of the VLAN to which the VC belongs.

---

## Related Commands

**show atm ilmi-config**

**show atm ilmi-status**

**show atm interface**

**show atm map**

**show atm signalling**

**show atm traffic**

**show atm vc**

# Supported Cisco IOS Commands

The Cisco IOS commands listed in Table B-2 are supported by the ATM module. Each command in Table B-2 is in one of the following categories:

- ATM module CLI commands  
Use these commands to enter and exit CLI command modes. For details about CLI command modes, see the “CLI Command Modes” section.
  - Configuration commands  
Use these commands to configure Flash memory on the ATM module.
  - ATM commands  
Use these commands to configure an ATM interface.
  - LANE commands  
Use these commands to configure a LAN client on the ATM interface for LANE.
- For detailed descriptions of these commands, refer to your Cisco IOS documentation.

**Table B-2      Supported Cisco IOS Commands**

Command	Description	Type <sup>1</sup>	Mode <sup>2</sup>
alias	Creates a shorthand alias.	IOS/ATM	GC
atm idle-timeout	Changes the idle timer for SVCs on an interface.	IOS/ATM	IC
atm ilmi-keepalive	Enables ILMI keepalives.	IOS/ATM	IC
atm nsap-address	Enables point-to-multipoint signaling to the ATM switch.	IOS/ATM	IC
atm sonet	Sets the mode of operation and control type of an ATM cell.	IOS/ATM	EXEC



---

**Table B-2      Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>atm uni-version</b>	Specifies the UNI version 3.0 or 3.1 the router should use when ILMI link autodetermination is unsuccessful or ILMI is disabled.	IOS/ATM	IC
<b>banner</b>	Defines a login banner.	IOS/ATM	EXEC
<b>clear atm vc</b>	Clears a specified SVC.	IOS/ATM	IC
<b>clear counters</b>	Clears Media Access Control (MAC) and port counters.	IOS/ATM	EXEC
<b>clear interface</b>	Resets the hardware logic on an interface.	IOS/ATM	EXEC
<b>clear lane le-arp</b>	Clears the dynamic LANE Address Resolution Protocol (LE_ARP) table or a single LE_ARP entry of the LANE client.	IOS/LAN	EXEC
<b>clear line</b>	Returns a terminal to idle state.	IOS/ATM	EXEC
<b>configure</b>	Enters global configuration mode.	IOS/ATM	EXEC
<b>description</b>	Adds a description to an interface configuration.	IOS/ATM	IC
<b>debug atm</b>	Displays ATM errors.	IOS/ATM	EXEC
<b>debug lane</b>	Displays ATM events.	IOS/ATM	EXEC
<b>debug packet</b>	Displays information on packets that the network cannot classify.	IOS/ATM	EXEC
<b>debug sscop</b>	Enables debugging for the Service Specific Connection Oriented Protocol (SSCOP).	IOS/ATM	EXEC

**Table B-2**      **Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>disable</b>	Returns the management console interface to user EXEC mode.	IOS/ATM	EXEC
<b>editing</b>	Enables enhanced editing mode for a particular line.	IOS/ATM	LC
<b>enable</b>	Enters privileged EXEC mode.	IOS/ATM	EXEC
<b>enable password</b>	Sets a local password to control access to various privilege levels.	IOS/ATM	GC
<b>end</b>	Exits to configuration mode.	IOS/ATM	GC
<b>full-help</b>	Retrieves help for the full set of user-level commands.	IOS/ATM	All ATM
<b>help</b>	Displays a brief description of the help system.	Switch	N, P
<b>history</b>	Displays the command history.	IOS/ATM	Line
<b>hostname</b>	Modifies the host name for the network server.	IOS/ATM	GC
<b>interface</b>	Configures an interface type and enters interface configuration mode.	IOS/ATM	GC
<b>lane bus-atm-address</b>	Specifies an ATM address—and overrides the automatic ATM address assignment—or the broadcast-and-unknown server on the specified subinterface.	IOS/LAN	IC
<b>lane client</b>	Activates a LANE client on the specified subinterface.	IOS/LAN	IC

---

**Table B-2      Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>lane client-atm-address</b>	Specifies an ATM address—and overrides the automatic ATM address assignment—for the LANE client on the specified subinterface.	IOS/LAN	IC
<b>lane config-atm-address</b>	Specifies a configuration server ATM address explicitly.	IOS/LAN	IC
<b>lane le-arp</b>	Adds a static entry to the LE_ARP table of the LANE client configured on the specified subinterface.	IOS/LAN	IC
<b>lane server-atm-address</b>	Specifies an ATM address—and overrides the automatic ATM address assignment—for the LANE server on the specified subinterface.	IOS/LAN	IC
<b>login</b>	Enables password checking at login.	IOS/ATM	LC
<b>logout</b>	Warns users of a forced timeout.	IOS/ATM	LC
<b>no</b>	Uses the command defaults.	IOS/ATM	LC
<b>privilege</b>	Sets the privilege level for a command.	IOS/ATM	GC
<b>reload</b>	Reloads the operating system.	IOS/Conf	EXEC
<b>show</b>	Displays running system information.	IOS/ATM	EXEC
<b>show aliases</b>	Displays all alias commands or the alias commands in a specified mode.	Switch	N, P
<b>show atm ilmi</b>	Displays ILMI information.	IOS/ATM	EXEC

**Table B-2 Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>show atm interface atm</b>	Displays ATM-specific information about an ATM interface.	IOS/ATM	EXEC
<b>show atm traffic</b>	Displays current global ATM traffic to and from all ATM networks connected to the switch.	IOS/ATM	EXEC
<b>show atm vc</b>	Displays all active ATM virtual connections (PVCs and SVCs) and traffic information.	IOS/ATM	EXEC
<b>show buffers</b>	Displays statistics for the buffer pools on the network server.	IOS/ATM	EXEC
<b>show configuration</b>	Displays contents of nonvolatile memory.	IOS/ATM	EXEC
<b>show controllers</b>	Displays the interface controller status.	IOS/ATM	EXEC
<b>show controller address-table</b>	Shows the address table entries.	IOS/ATM	EXEC
<b>show controller atm</b>	Shows the ATM segmentation and reassembly (SAR) counters.	IOS/ATM	EXEC
<b>show controller eth</b>	Displays the MAC counters.	IOS/ATM	EXEC
<b>show controller mem</b>	Displays the memory buffer pools.	IOS/ATM	EXEC
<b>show controller relay</b>	Displays the Ethernet-to-ATM and ATM-to-Ethernet relay counters.	IOS/ATM	EXEC
<b>show controller rfc</b>	Displays the RFC-1483 counters.	IOS/ATM	EXEC

---

**Table B-2      Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>show controller sonet</b>	Displays the SONET counters.	IOS/ATM	EXEC
<b>show controller switch-port</b>	Displays the switch port information.	IOS/ATM	EXEC
<b>show debugging</b>	Displays information about the types of Cisco Discovery Protocol (CDP) debugging that are enabled for your module.	IOS/ATM	EXEC
<b>show history</b>	Lists the commands you have entered in the current EXEC session.	IOS/ATM	EXEC
<b>show interface</b>	Displays information about the ATM interface.	IOS/ATM	EXEC
<b>show lane</b>	Displays detailed information for all the LANE components configured on an interface or on an emulated LAN.	IOS/LAN	EXEC
<b>show lane brief</b>	Bypasses individual connection client information.	IOS/LAN	EXEC
<b>show lane client</b>	Displays detailed LANE information for all the LANE clients configured on an interface or on an emulated LAN.	IOS/LAN	EXEC
<b>show lane default-atm-addresses</b>	Displays the automatically assigned ATM address of each LANE component on a specified interface.	IOS/LAN	EXEC
<b>show lane interface</b>	Identifies the interface.	IOS/LAN	EXEC

**Table B-2      Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>show lane le-arp</b>	Displays the LANE ARP table of the LANE client configured on an interface or on an emulated LAN.	IOS/LAN	EXEC
<b>show lane name</b>	Identifies the ELAN name.	IOS/ATM	EXEC
<b>show line</b>	Displays connection information for a line running in asynchronous mode.	IOS/ATM	EXEC
<b>show location</b>	Displays the system location.	IOS/ATM	EXEC
<b>show logging</b>	Displays the state of logging (syslog).	Switch	P
<b>show memory</b>	Shows statistics about memory, including memory-free pool statistics.	IOS/ATM	EXEC
<b>show privilege</b>	Displays your current privilege level.	IOS/ATM	EXEC
<b>show processes</b>	Displays information about the active processes.	IOS/ATM	EXEC
<b>show registry</b>	Displays function registry information.	IOS/ATM	EXEC
<b>show reload</b>	Displays the reload status of the module.	IOS/ATM	EXEC
<b>show running-config</b>	Displays the configuration information currently running on the terminal.	IOS/ATM	EXEC
<b>show sscop</b>	Shows Service-Specific Connection Oriented Protocol (SSCOP) details for all ATM interfaces.	IOS/ATM	EXEC
<b>show stacks</b>	Monitors the stack utilization of processes and interrupt routines.	IOS/ATM	EXEC

---

**Table B-2      Supported Cisco IOS Commands (Continued)**

<b>Command</b>	<b>Description</b>	<b>Type<sup>1</sup></b>	<b>Mode<sup>2</sup></b>
<b>show startup-config</b>	Displays the contents of NVRAM, if present and valid, or shows the configuration file pointed to by the <i>config_file</i> environment variable.	IOS/ATM	EXEC
<b>show tech-support</b>	Displays general system information about the module.	IOS/ATM	EXEC
<b>show terminal</b>	Displays terminal configuration parameters.	IOS/ATM	EXEC
<b>show users</b>	Displays information about terminal lines.	IOS/ATM	EXEC
<b>show version</b>	Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.	IOS/Conf	IC
<b>shutdown</b>	Disables the interface.	IOS/Conf	IC
<b>sscop keepalive-time</b>	Changes the keepalive timer.	IOS/ATM	IC
<b>sscop max-cc</b>	Changes the retry count of connection control.	IOS/ATM	IC
<b>sscop max-stat</b>	Identifies the maximum number of retries for connection control operations.	IOS/ATM	IC
<b>sscop poll-timer</b>	Changes the poll timer.	IOS/ATM	IC
<b>sscop receive-window</b>	Changes the receiving window.	IOS/ATM	IC
<b>sscop send-window</b>	Changes the transmitter window.	IOS/ATM	IC
<b>terminal editing</b>	Enables enhanced editing mode on the local line.	IOS/ATM	EXEC

Table B-2      Supported Cisco IOS Commands (Continued)

Command	Description	Type <sup>1</sup>	Mode <sup>2</sup>
terminal history	Enables the command history feature for the current terminal session or changes the size of the command history buffer for the current terminal session.	IOS/ATM	EXEC
terminal length	Sets number of lines on a screen.	IOS/ATM	EXEC
terminal monitor	Copies debug output to the current terminal line.	IOS/ATM	EXEC
terminal terminal-type	Sets the terminal type.	IOS/ATM	EXEC
terminal width	Sets width of the display terminal.	IOS/ATM	EXEC
undebg	Disables debugging functions.	IOS/ATM	EXEC
write erase	Erases the configuration information in NVRAM.	IOS/Conf	EXEC
write memory	Restarts the configuration information stored in NVRAM.	IOS/Conf	EXEC
write terminal	See <b>show running_config</b> command.	IOS/Conf	EXEC

- 1. Type indicates whether the command is a switch command or an ATM-specific command. ATM commands include Interface, Configuration, ATM, and LAN emulation commands.
- 2. Mode indicates whether a switch command is "Normal" or "Privileged" and whether an ATM command is an interface configuration, privileged, EXEC, global configuration, all ATM, or line command.



# Configuration Examples

---

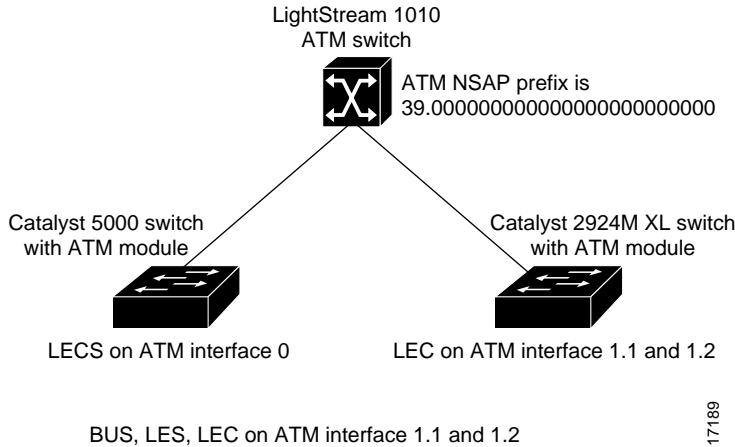
This appendix contains configuration examples for a LEC and LES and RFC 1483. The LANE configuration example shows you the process of configuring LANE servers and clients. The RFC-1483 PVC configuration example shows you the process of configuring support for RFC 1483.

## LANE Configuration Example

Figure C-1 shows a LANE configuration example with the following components:

- LightStream 1010 ATM switch
- Catalyst 2924M XL switch with an ATM module
- Catalyst 5000 series switch with an ATM module

**Figure C-1 LANE Configuration Example**



## Configuration Example Assumptions

The following assumptions apply to the LANE configuration example in Figure C-1:

- The Enterprise Edition Software is running on the 2924M XL switch.
- The LightStream 1010 ATM switch default ATM Network Service Access Point (NSAP) prefix is 39.00000000000000000000000000000000.
- The Catalyst 5000 switch has an ATM module installed in Slot 3.
- The Catalyst 5000 switch runs the LECS on ATM interface 0.
- The Catalyst 5000 switch runs the LEC BUS and LES on ATM interface 0.1 for the emulated LAN *default*.
- The Catalyst 5000 switch runs the LEC BUS and LES on ATM interface 0.2 for the emulated LAN *engineering*.
- The 2924M XL switch has an ATM module installed in Slot A.
- The 2924M XL switch runs the LEC on ATM interface 1.1 for the emulated LAN *default*.

- The 2924M XL switch runs the LEC on ATM interface 1.2 for the emulated LAN *engineering*.
- The VLAN trunk is turned on for Slot A of the 2924M XL switch.

## Configuration Example Procedure

To configure the LANE example in Figure C-1, follow these steps:

**Step 1** Configure the LECS ATM NSAP address on the LightStream 1010 ATM switch:

- (a) Start a session on the Catalyst 5000 ATM module by entering the **session 3** command at the Catalyst 5000 management console:

```
Console> session 3
Trying ATM-3...
Connected to ATM-3.
Escape character is '^]'.
ATM>
```

- (b) Obtain the default LECS address from the Catalyst 5000 by entering the **enable** and **show lane default** commands:

```
ATM> enable
ATM# show lane default
interface ATM0:
LANE Client:          39.000000000000000000000000.00605C28DA20.**
LANE Server:          39.000000000000000000000000.00605C28DA21.**
LANE Bus:              39.000000000000000000000000.00605C28DA22.**
LANE Config Server: 39.000000000000000000000000.00605C28DA23.00
note: ** is the subinterface number byte in hex
ATM#
```

The default LECS address is  
39.000000000000000000000000.00605C28DA23.00.

- (c) Configure the LECS ATM NSAP address and its LECS sequence number on the LightStream1010 ATM switch. Use the default LECS address obtained from the Catalyst 5000 switch, and append the number 1 at the end of the address to specify the sequence number.
- (d) Enter the **enable**, **configure terminal**, and **atm lecs-address atm\_address** commands at the LightStream 1010 management console:

```
Switch> enable
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# atm lecs-address
39.0000000000000000000000000000.00605C28DA23.00 1
Switch(config)# ^Z
Switch#
```

The LightStream 1010 LECS ATM NSAP address is 39.0000000000000000000000000000.00605C28DA23.00. The LECS address sequence number is 1; it is the first LECS on the LightStream 1010 ATM switch.

- (e) Save the configuration to NVRAM by entering the **write memory** command.

- Step 2** Configure the BUS and LES for the emulated LAN *default* on the Catalyst 5000 switch by entering the **configure terminal**, **interface atm0.1**, and **lane server-bus ethernet default** commands at the Catalyst 5000 switch management console:

```
ATM# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ATM(config)# interface atm0.1
ATM(config-if)# lane server-bus ethernet default
ATM(config-if)# ^Z
ATM#
```

- Step 3** Configure the BUS and LES for the ELAN *engineering* on the Catalyst 5000 switch by entering the **interface atm0.2** and **lane server-bus ethernet engineering** commands at the Catalyst 5000 switch management console:

```
ATM(config)# interface atm0.2
ATM(config-if)# lane server-bus ethernet engineering
ATM(config-if)# ^Z
ATM#
```

- Step 4** Save the configuration to NVRAM by entering the **write memory** command.

- Step 5** Configure the LECS database on the Catalyst 5000 switch with the LANE server address obtained in Step 1. Replace the asterisks ( **\*\*** ) with the subinterface number of the interface in which the LES and BUS is configured. In this example, that number is 01 for the ELAN named *default* and 02 for the ELAN named *engineering*.

Enter the **lane database database\_name, name elan\_name server-atm-address atm\_address**, and the **default-name elan\_name** commands:

```
ATM(config)# lane database test
ATM(lane-config-database)# name default server-atm-address
39.0000000000000000000000000000.00605C28DA21.01
ATM(lane-config-database)# default-name default
ATM(lane-config-database)# name engineering server-atm-address
39.0000000000000000000000000000.00605C28DA21.02
ATM(lane-config-database)# ^Z
ATM#
```

The LECS database is created with the following particulars:

- The LECS database name is *test*.
- The ELAN names are *default* and *engineering*.
- The LES ATM NSAP address is 39.0000000000000000000000000000.00605C28DA21.01 for the ELAN named *default*.
- The LES ATM NSAP address is 39.0000000000000000000000000000.00605C28DA21.02 for the ELAN named *engineering*.

- Step 6** Save the configuration to NVRAM by entering the **write memory** command.

- Step 7** Start and bind the LECS on the Catalyst 5000 switch by entering the **interface atm0**, the **lane config database\_name**, and the **lane auto-config-atm-address** commands:

```
ATM# configure terminal
Enter configuration commands, one per line, End with CNTL/Z.
ATM(config)# interface atm0
ATM(config-if)# lane config test
ATM(config-if)# lane auto-config-atm-address
ATM(config-if)# ^Z
ATM#
```

- Step 8** Save the configuration to NVRAM by entering the **write memory** command.

- Step 9** Start the LEC for the ELAN named *default* on the Catalyst 5000 switch by entering the **interface atm0.1** and the **lane client ethernet 1 default** commands:

```
ATM# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ATM(config)# interface atm0.1
ATM(config-subif)# lane client ethernet 1 default
ATM(config-subif)# ^Z
ATM#
```

- Step 10** Start the LEC for the ELAN named *engineering* on the Catalyst 5000 switch by entering the **interface atm0.2** and the **lane client ethernet 2 engineering** commands:

```
ATM# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
ATM(config)# interface atm0.2
ATM(config-subif)# lane client ethernet 2 engineering
ATM(config-subif)# ^Z
ATM#
```

- Step 11** Save the configuration to NVRAM by entering the **write memory** command.

- Step 12** Start a session on the ATM module by entering the **session 1** command at the 2924M XL management console:

```
switch# session 1

ATM>Entering Console for module in slot 1
Type  "^G" to end this session

Press RETURN to get started!

ATM>
```

- Step 13** Start the LEC for the ELAN named *default* on the 2924M XL switch by entering the **interface atm1.1 multipoint** and the **lane client ethernet 1 default** commands at the 2924M XL management console:

```
ATM# enable
ATM# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
ATM(config)# interface atm1.1 multipoint
ATM(config-if)# lane client ethernet 1 default
ATM(config-if)# ^Z
ATM#
```

- Step 14** Start the LEC for the ELAN named *engineering* on the 2924M XL switch by entering the **interface atm1.2 multipoint** and the **lane client ethernet 2 engineering** commands at the 2924M XL management console:

```
ATM# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
ATM(config)# interface atm1.2 multipoint
ATM(config-if)# lane client ethernet 2 engineering
ATM(config-if)# ^Z
ATM#
```

- Step 15** Save the configuration to NVRAM by entering the **write memory** command.

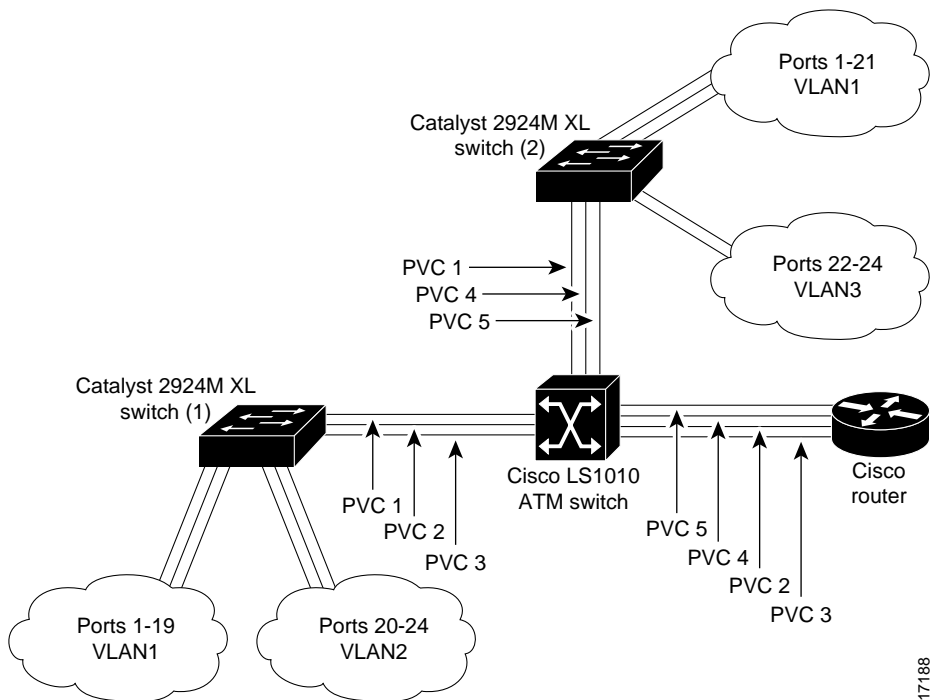
```
ATM# write memory
Building configuration ...
[OK]
ATM#
```

## RFC-1483 PVC Configuration Example

Figure C-2 shows an example of an RFC-1483 PVC configuration with of the following components:

- LightStream 1010 ATM switch
- Catalyst 2924M XL and Catalyst 2924M XL switches with an ATM module
- Cisco router

**Figure C-2** RFC-1483 PVC Configuration Example





## Configuration Example Assumptions

The following assumptions apply to the RFC-1483 PVC configuration example in Figure C-2:

- The Enterprise Edition software is running on the Catalyst 2900 series switches.
- The ATM modules are in Slot A.
- Ports on the Catalyst 2900 series switches are in several VLANs.
- The VLAN domain name is *Cisco Engineering*.
- The Cisco router is configured with PVCs.
- The purpose of the Cisco router is to route packets between different VLANs.

The following specifications are required to connect the devices to the LS1010 ATM switch:

LS1010 ATM Switch Interface	Connection
atm0/0/0	Catalyst 2924M XL switch (1)
atm0/0/1	Catalyst 2924M XL switch (2)
atm0/0/2	Cisco router

The following specifications are assumed for the VLAN and switch connections:

PVC	VLAN/Switch Connections	VCD	VPI	VLAN ID	VCI	Peak Rate (kbps)	Average Rate (kbps)	Burst Cell Rate
1	Connects Catalyst 2924M XL switch (1) to Catalyst 2924M XL switch (2) on VLAN1	100	0	1	100	default	default	default
2	Connects Catalyst 2924M XL switch (1) to Cisco router on VLAN1	101	0	1	101	50,000	50,000	32
3	Connects Catalyst 2924M XL switch (1) to Cisco router on VLAN2	102	0	2	102	30,000	30,000	4

PVC	VLAN/Switch Connections	VCD	VPI	VLAN ID	VCI	Peak Rate (kbps)	Average Rate (kbps)	Burst Cell Rate
4	Connects Catalyst 2924M XL switch (2) to Cisco router on VLAN3	103	0	3	103	30,000	10,000	32
5	Connects Catalyst 2924M XL switch (2) to Cisco router on VLAN1	104	0	1	104	30,000	20,000	default

Configuration Example Procedure

To configure the RFC-1483 PVC example in Figure C-2, follow these steps:

- Step 1**    Configure VLANs on the Catalyst 2924M XL switch (1).
- Step 2**    Configure VLANs on the Catalyst 2924M XL switch (2).
- Step 3**    Configure PVCs on the ATM Network.
- Step 4**    Configure PVCs on Catalyst 2924M XL switch (1).
- Step 5**    Configure PVCs on Catalyst 2924M XL switch (2).

Configure VLANs on the Catalyst 2924M XL Switch (1)

To configure VLANs on the Catalyst 2924M XL switch (1), use the Enterprise Edition Software to do the following:

- Step 1**    Assign a management domain.
- Step 2**    Define VLANs.
- Step 3**    Group switch ports to VLANs.
- Step 4**    Check the trunk mode.

Refer to the *Catalyst 2900 Series XL Enterprise Edition Software Configuration Guide* for information about the following:

- Assigning a management domain

- Defining VLANs
- Grouping switch ports to VLANs

### Checking the Trunk Mode

The ATM module automatically displays as a VLAN trunk. If the module does not display as a VLAN trunk when you use the **show interface atm1.1 switchport** command, check the following:

- Ensure that you are using the Enterprise Edition Software (IOS Release 11.2(8)SA5 or later). The standard edition software does not support the ATM module in trunk mode.
- Ensure that you are not attempting to run multi-VLANs and trunks simultaneously.

## Configure VLANs on the Catalyst 2924M XL Switch (2)

When the Virtual Terminal Protocol (VTP) is enabled, the Catalyst 2924M XL switch (2) learns the VLAN configuration from Catalyst 2924M XL switch (1). It is not necessary to assign a management domain and define a VLAN. To configure VLANs on the Catalyst 2924M XL switch (1), do the following:

- Group switch ports to VLAN3.
- Check the trunk mode.

Refer to the *Catalyst 2900 Series XL Enterprise Edition Software Configuration Guide* for information about grouping switch ports to VLANs. For information on trunk modes, see “Checking the Trunk Mode.”

## Configure PVCs on the ATM Network

To configure PVCs on the ATM network, do the following on the LS1010 ATM switch:

- Step 1** Create PVC1 on the ATM network by entering the **enable** command and providing the information as shown in the following example.

```
Switch> enable
Password: <password>
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# int atm0/0/0
Switch(config-if)# atm pvc 0 100 interface atm0/0/1 0 100
Switch(config-if)# ^Z
Switch#
```

- Step 2** Verify the setup of PVC 1 by entering the **show atm vc interface** command.

```
Switch# show atm vc interface atm0/0/0
```

The following display appears:

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM0/0/0	0	5	PVC	ATM2/0/0	0	48	QSAAL	UP
ATM0/0/0	0	16	PVC	ATM2/0/0	0	32	ILMI	UP
ATM0/0/0	0	100	PVC	ATM0/0/1	0	100		UP

- Step 3** Create PVC2 on the ATM network by entering the **enable** command and providing the information as shown in the following example.

```
Switch> enable
Password: <password>
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# int atm0/0/0
Switch(config-if)# atm pvc 0 101 interface atm0/0/2 0 101
Switch(config-if)# ^Z
Switch#
```

**Step 4** Verify the setup of PVC2 by entering the **show atm vc interface** command.

Switch# **show atm vc interface atm0/0/0**

The following display appears:

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM0/0/0	0	5	PVC	ATM2/0/0	0	48	QSAAL	UP
ATM0/0/0	0	16	PVC	ATM2/0/0	0	32	ILMI	UP
ATM0/0/0	0	100	PVC	ATM0/0/1	0	100		UP
ATM0/0/0	0	101	PVC	ATM0/0/2	0	101		UP

**Step 5** Create PVC3 on the ATM network by entering the **enable** command for the LS1010 ATM switch, and providing the information as shown in the following example.

```
Switch> enable
Password: <password>
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# int atm0/0/0
Switch(config-if)# atm pvc 0 102 interface atm0/0/2 0 102
Switch(config-if)# ^Z
Switch#
```

**Step 6** Verify the setup of PVC3 by entering the **show atm vc interface** command.

Switch# **show atm vc interface atm0/0/0**

The following display appears:

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM0/0/0	0	5	PVC	ATM2/0/0	0	48	QSAAL	UP
ATM0/0/0	0	16	PVC	ATM2/0/0	0	32	ILMI	UP

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM0/0/0	0	100	PVC	ATM0/0/1	0	100		UP
ATM0/0/0	0	101	PVC	ATM0/0/2	0	101		UP
ATM0/0/0	0	102	PVC	ATM0/0/2	0	102		UP

**Step 7** Create PVC4 on the ATM network by entering the **enable** command and providing the information as shown in the following example.

```
Switch> enable
Password: <password>
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# int atm0/0/1
Switch(config-if)# atm pvc 0 103 interface atm0/0/2 0 103
Switch(config-if)# ^Z
Switch#
```

**Step 8** Verify the setup of PVC4 by entering the **show atm vc interface** command.

```
Switch# show atm vc interface atm0/0/1
```

The following display appears:

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM0/0/1	0	5	PVC	ATM2/0/0	0	49	QSAAL	UP
ATM0/0/1	0	16	PVC	ATM2/0/0	0	33	ILMI	UP
ATM0/0/1	0	100	PVC	ATM0/0/0	0	100		UP
ATM0/0/1	0	103	PVC	ATM0/0/2	0	103		UP

**Step 9** Create PVC5 on the ATM network by entering the **enable** command and providing the information as shown in the following example.

```
Switch> enable
Password: <password>
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# int atm0/0/1
Switch(config-if)# atm pvc 0 104 interface atm0/0/2 0 104
Switch(config-if)# ^Z
Switch#
```

**Step 10** Verify the setup of PVC5 by entering the **show atm vc interface** command.

```
Switch# show atm vc interface atm0/0/1
```

The following display appears:

Interface	VPI	VCI	Type	X-Interface	X-VPI	X-VCI	Encap	Status
ATM0/0/0	0	5	PVC	ATM2/0/0	0	50	QSAAL	UP
ATM0/0/0	0	16	PVC	ATM2/0/0	0	34	ILMI	UP
ATM0/0/1	0	100	PVC	ATM0/0/1	0	100		UP
ATM0/0/1	0	103	PVC	ATM0/0/2	0	103		UP
ATM0/0/1	0	104	PVC	ATM0/0/2	0	104		UP

# Configure Catalyst 2924M XL Switch (1)

To configure Catalyst 2924M XL switch (1), do the following:

- Step 1** Start a session on the ATM module by entering the **session 1** command at the 2924M XL management console:

```
switch# session 1

ATM>Entering Console for module in slot 1
Type  "^G" to end this session

Press RETURN to get started!

ATM>
```

- Step 2** Set up PVC1, PVC2 and PVC3 on the Catalyst 2924M XL switch (1) by entering the **enable** command and providing the information as shown in the following example.

```
ATM > enable
ATM# configure terminal
Enter configuration commands, one per line. End with CTRL/Z.
ATM(config)# interface atm1
ATM(config-if)# atm pvc 100 0 100 aal5snap
ATM(config-if)# atm pvc 101 0 101 aal5snap 50000 50000 32
ATM(config-if)# atm pvc 102 0 102 aal5snap 30000 30000 4
ATM(config-if)# ^Z
```

- Step 3** Bind PVC1 and PVC2 to VLAN1, and bind PVC3 to VLAN2 by entering the **configure terminal** command and providing the information as shown in the following example.

```
ATM# configure terminal
Enter configuration commands, one per line. End with CTRL/Z.
ATM(config)# interface atm1
ATM(config-if)# atm bind pvc vlan 100 1
ATM(config-if)# atm bind pvc vlan 101 1
ATM(config-if)# atm bind pvc vlan 102 2
```

- Step 4** Verify the setup on the Catalyst 2924M XL switch (1) by entering the **show atm vlan** command.

```
ATM# show atm vlan
```



The following display appears:

VCD	VLAN-ID
100	1
101	1
102	2

**Step 5** Continue verifying the setup on the Catalyst 2924M XL switch (1) by entering the **show atm vc** command.

ATM# **show atm vc**

The following display appears:

Interface	VCD	VPI	VCI	Type	AAL/ Encapsulation	Peak kbps	Avg. kbps	Burst Cells	Status
ATM1	1	0	5	PVC	AAL5-SAAL	155000	155000	4	ACT
ATM1	2	0	16	PVC	AAL5-ILMI	155000	155000	4	ACT
ATM1	100	0	100	PVC	AAL5-SNAP	155000	155000	4	ACT
ATM1	101	0	101	PVC	AAL5-SNAP	50000	50000	32	ACT
ATM1	102	0	102	PVC	AAL5-SNAP	30000	30000	4	ACT

**Step 6** Write the configuration to Flash EPROM by entering the **write memory** command.

```
ATM# write memory
Building configuration ...
[OK]
ATM#
```

# Configure PVCs on Catalyst 2924M XL Switch (2)

To configure PVCs on switch (2), do the following:

- Step 1** Start a session on the ATM module by entering the **session 1** command at the 2924M XL management console:

```
switch# session 1

ATM>Entering Console for module in slot 1
Type  "^G" to end this session

Press RETURN to get started!

ATM>
```

- Step 2** Set up PVC1, PVC4, and PVC 5 on the Catalyst 2924M XL switch (2) by entering the **enable** command and providing the information as shown in the following example.

```
ATM > enable
ATM# configure terminal
Enter configuration commands, one per line. End with CTRL/Z.
ATM(config)# interface atm1
ATM(config-if)# atm pvc 100 0 100 aal5snap
ATM(config-if)# atm pvc 103 0 103 aal5snap 30000 10000 32
ATM(config-if)# atm pvc 104 0 104 aal5snap 30000 20000
ATM(config-if)# ^Z
```

- Step 3** Bind PVC1 and 5 to VLAN1, and bind PVC 4 to VLAN3 by entering the **configure terminal** command and providing the information as shown in the following example.

```
ATM# configure terminal
Enter configuration commands, one per line. End with CTRL/Z.
ATM(config)# interface atm1
ATM(config-if)# atm bind pvc vlan 100 1
ATM(config-if)# atm bind pvc vlan 104 1
ATM(config-if)# atm bind pvc vlan 103 3
```

- Step 4** Verify the setup on the Catalyst 2924M XL switch (2) by entering the **show atm vlan** command.

```
ATM# show atm vlan
```

The following display appears:

VCD	VLAN-ID
100	1
103	3
104	1

**Step 5** Continue verifying the setup on the Catalyst 2924M XL switch (2) by entering the **show atm vc** command.

```
ATM# show atm vc
```

The following display appears:

Interface	VCD	VPI	VCI	Type	AAL/ Encapsulation	Peak kbps	Avg. kbps	Burst Cells	Status
ATM1	1	0	5	PVC	AAL5-SAAL	155000	155000	4	ACT
ATM1	2	0	16	PVC	AAL5-ILMI	155000	155000	4	ACT
ATM1	100	0	100	PVC	AAL5-SNAP	155000	155000	4	ACT
ATM1	103	0	103	PVC	AAL5-SNAP	30000	10000	32	ACT
ATM1	104	0	104	PVC	AAL5-SNAP	30000	20000	4	ACT

**Step 6** Write the configuration to Flash EPROM by entering the **write memory** command.

```
ATM# write memory
Building configuration ...
[OK]
ATM#
```



# Translated Safety Warnings

---

## Class 1 Laser Product Warning



**Warning** Class 1 laser product.

**Waarschuwing** Klasse-1 laser produkt.

**Varoitus** Luokan 1 lasertuote.

**Attention** Produit laser de classe 1.

**Warnung** Laserprodukt der Klasse 1.

**Avvertenza** Prodotto laser di Classe 1.

**Advarsel** Laserprodukt av klasse 1.

**Aviso** Produto laser de classe 1.

**¡Advertencia!** Producto láser Clase I.

**Varning!** Laserprodukt av klass 1.

**警告** 第1種レーザー製品

---

## Laser Beam Exposure Warning



**Warning** Avoid exposure to the laser beam.

**Waarschuwing** Vermijd blootstelling aan de straal.

**Varoitus** Vältä säteelle altistumista.

**Attention** Eviter toute exposition au faisceau.

**Warnung** Schützen Sie sich vor Strahlung.

**Avvertenza** Evitare l'esposizione al raggio.

**Advarsel** Unngå å bli utsatt for strålen.

**Aviso** Evite exposição ao raio.

**¡Advertencia!** Evitar la exposición al haz.

**Varning!** Utsätt dig inte för laserstrålningen.

## A

- AAL5 defined 1-4
- agency approvals A-2, A-3
- alias command B-16
- ATM 155 MM Fiber module 1-5
- ATM 155 SM Fiber modules 1-8
- ATM 155 UTP module 1-11
- atm bind command B-9
- ATM defined vii
- atm idle-timeout command B-16
- atm ilmi-keepalive command B-16
- atm lecs-address command C-4
- ATM module
  - connecting cables 2-6, 2-7, 2-8
  - described 1-1
  - installing 2-4
  - removing 2-8
  - troubleshooting 4-1
- atm nsap-address command B-16
- atm pvc command B-11
- atm sonet command B-16
- atm uni-version command B-17

## B

- banner command B-17
- BUS defined 2-2

## C

- cables, connecting 2-6
- cabling
  - Category 5 UTP 1-12, 2-7
  - fiber-optic 1-7, 1-10
  - transmission distances 1-7, 1-10, 1-12

- Cisco IOS Commands for LEC 3-2
- Cisco Visual Switch Manager 1-4
- clear atm vc command B-17
- clear counters command B-17
- clear interface command B-17
- clear lane le-arp command B-17
- clear line command B-17
- CLI, accessing 3-1
- command modes defined B-1
- command-line interface, accessing 3-1
- commands
  - alias B-16
  - atm bind B-9
  - atm idle-timeout B-16
  - atm ilmi-keepalive B-16
  - atm nsap-address B-16
  - atm pvc B-11
  - atm sonet B-16
  - atm uni-version B-17
  - banner B-17
  - clear atm vc B-17
  - clear counters B-17
  - clear interface B-17
  - clear lane le-arp B-17
  - clear line B-17
  - configure B-17
  - configure terminal 3-3
  - debug atm B-17
  - debug lane B-17
  - debug packet B-17
  - debug sscop B-17
  - description B-17
  - disable B-18
  - editing B-18
  - enable 3-3, B-18, C-3
  - enable password B-18
  - end B-18
  - full-help B-18
  - help B-18

history	B-18	show lane	B-21
hostname	B-18	show lane brief	B-21
interface	B-18	show lane client	B-21
interface atm0	3-3	show lane default	C-3
lane auto-config-atm-address	C-6	show lane default-atm-addresses	B-21
lane bus-atm-address	B-18	show lane interface	B-21
lane client	B-18	show lane le-arp	B-22
lane client ethernet	3-3	show lane name	B-22
lane client-atm-address	B-19	show line	B-22
lane config	C-6	show location	B-22
lane config-atm-address	B-19	show logging	B-22
lane database	C-5	show memory	B-22
lane le-arp	B-19	show privilege	B-22
lane server-atm-address	B-19	show processes	B-22
login	B-19	show registry	B-22
logout	B-19	show reload	B-22
no	B-19	show running-config	B-22
privilege	B-19	show sscop	B-22
reload	B-19	show stacks	B-22
session 3	C-3	show startup-config	B-23
show	B-19	show tech-support	B-23
show aliases	B-19	show terminal	B-23
show atm ilmi	B-19	show users	B-23
show atm interface atm	B-20	show version	B-23
show atm traffic	B-20	shutdown	B-23
show atm vc	B-20	sscop keepalive-time	B-23
show atm vlan	B-14	sscop max-cc	B-23
show buffer	B-20	sscop max-stat	B-23
show configuration	B-20	sscop poll-timer	B-23
show controller address-table	B-20	sscop receive-window	B-23
show controller atm	B-20	sscop send-window	B-23
show controller eth	B-20	terminal	C-4
show controller mem	B-20	terminal editing	B-23
show controller relay	B-20	terminal history	B-24
show controller rfc	B-20	terminal length	B-24
show controller sonet	B-21	terminal monitor	B-24
show controller switch-port	B-21	terminal terminal-type	B-24
show controllers	B-20	terminal width	B-24
show debugging	B-21	undebug	B-24
show history	B-21	write erase	B-24
show interface	B-21	write memory	3-3, B-24, C-4



- write terminal B-24
- configuration examples
  - LANE C-1
  - RFC-1483 PVCs C-8
  - support for RFC 1483 3-8
- configure command B-17
- configure terminal command 3-3, C-4
- connectors
  - RJ-45 1-12, 2-7
  - SC fiber-optic 1-7, 1-10

## D

- debug atm command B-17
- debug lane command B-17
- debug packet command B-17
- debug sscop command B-17
- description command B-17
- dimensions, module A-1, A-2
- disable command B-18

## E

- editing command B-18
- electrostatic discharge
  - see ESD
- EMI agency approvals A-2, A-3
- enable command 3-3, B-18, C-3
- enable password command B-18
- end command B-18
- environmental ranges A-1, A-2
- ESD 2-3

## F

- features, module 1-4
- fiber-optic cable, connecting 2-6
- fiber-optic cabling requirements 1-7, 1-10
- fiber-optic connectors 1-5, 1-8
- full-help command B-18

## G

- global configuration mode B-2, B-5

## H

- help command B-18
- history command B-18
- hostname command B-18

## I

- ILMI defined 1-4
- installation 2-4
  - troubleshooting 4-1
- interface atm0 command 3-3, C-4, C-5
- interface command B-18
- interface configuration mode B-2, B-6

## L

- LAN emulation
  - see LANE
- LAN emulation client
  - see LEC
- LANE

- configuration example C-1
- configuration requirements 2-2
- lane auto-config-atm-address command C-6
- LANE broadcast-and-unknown server
  - see BUS
- lane bus-atm-address command B-18
- LANE client
  - see LEC 3-3
- lane client command B-18
- lane client ethernet command 3-3
- lane client-atm-address command B-19
- lane config command C-6
- lane config-atm-address command B-19
- LANE configuration server
  - see LECS
- lane database command C-5
- LANE defined vii
- lane le-arp command B-19
- LANE server
  - see LES
- lane server-atm-address command B-19
- lane server-bus ethernet default command C-4
- LANE servers
  - see LES 2-2
- LEC defined vii
- LECS defined 2-2
- LEDs, described 1-6, 1-9, 1-11
- LES defined 2-2
- line configuration mode B-3, B-7
- LLC encapsulation 3-6
- Local Management Interface
  - see ILMI
- Logical Link Control
  - see LLC
- login command B-19
- logout command B-19

## M

- Management Information Base
  - see MIBs 1-4
- MIBs defined 1-4
- modes
  - commands B-1
  - trunk C-11
- module type
  - ATM 155 MM Fiber 1-1
  - ATM 155 SM-LR Fiber 1-1
  - ATM 155 SM-MR Fiber 1-1
  - ATM 155 UTP 1-1

## N

- name default server-atm-address command C-5
- no command B-19
- NSAP defined C-2

## O

- OAM defined 1-4
- operating altitude A-1, A-2
- operating humidity A-1, A-2
- operating temperature A-1, A-2

## P

- packing list 2-1
- password recovery 4-4
- permanent virtual connections
  - see PVC
- port statistics, ATM 3-5
- power consumption A-1
- power up 2-3

- power-on self-test (POST) 4-1
- privilege command B-19
- privileged EXEC mode B-2, B-4
- PVC
  - configuration example 3-8, C-8
  - for RFC 1483 3-6, C-1
  - in the ATM network 3-7
- PVCs, mapped to VLANs 3-7

## R

- regulatory statements 2-1
- reload command B-19
- removal, module 2-8
- RFC 1483
  - configuration example 3-8, C-8
  - configuring support for 3-6
  - using LECs 3-7
  - using PVCs 3-7
- RJ-45 connector
  - described 1-12
  - on front panel 1-11
  - pin assignments 1-13

## S

- safety warnings D-1
- SC connector
  - described 1-10
  - on front panel 1-5, 1-8
- SC connector, described 1-7
- SDH defined 1-4
- session 3 command C-3
- show aliases command B-19
- show atm ilmi command B-19
- show atm interface atm command B-20
- show atm traffic command B-20
- show atm vc command B-20

- show atm vlan command B-14
- show buffer command B-20
- show command B-19
- show configuration command B-20
- show controller address-table command B-20
- show controller atm command B-20
- show controller eth command B-20
- show controller mem command B-20
- show controller relay command B-20
- show controller rfc command B-20
- show controller sonet command B-21
- show controller switch-port command B-21
- show controllers command B-20
- show debugging command B-21
- show history command B-21
- show interface command B-21
- show lane brief command B-21
- show lane client command B-21
- show lane command B-21
- show lane default C-3
- show lane default-addresses command B-21
- show lane interface command B-21
- show lane le-arp command B-22
- show lane name command B-22
- show line command B-22
- show location command B-22
- show logging command B-22
- show memory command B-22
- show privilege command B-22
- show processes command B-22
- show registry command B-22
- show reload command B-22
- show running-config command B-22
- show sscop command B-22
- show stacks command B-22
- show startup-config command B-23
- show tech-support command B-23
- show terminal command B-23
- show users command B-23
- show version command B-23
- shutdown command B-23

- SNMP 1-4
- SONET defined 1-4
- specifications, technical A-1, A-2
- sscop keepalive-time command B-23
- sscop max-cc command B-23
- sscop max-stat command B-23
- sscop poll-timer command B-23
- sscop receive-window command B-23
- sscop send-window command B-23
- standards, module 1-4
- status, LED 1-6, 1-9, 1-11
- storage altitude A-1, A-2
- storage humidity A-1, A-2
- storage temperature A-1, A-2
- STS-3c defined 1-4
- switched virtual connection (SVCs)

## T

- technical specifications A-1
- terminal editing command B-23
- terminal history command B-24
- terminal length command B-24
- terminal monitor command B-24
- terminal terminal-type command B-24
- terminal width command B-24
- transmission distances
  - Category 5 UTP 1-12
  - multimode fiber-optic 1-7
  - single-mode fiber-optic 1-10
- troubleshooting
  - corrupted software 4-2
  - installation 4-1
  - password recovery 4-4
  - software upgrades 4-5

## U

- undebug command B-24
- upgrading software 4-5
- user EXEC mode B-2, B-3
- User-Network Interface (UNI) 1-4
- UTP cable, connecting 2-7

## V

- VCCs defined 1-4
- virtual LAN
  - see VLANs
- Visual Switch Manager 1-4
- VLANs, mapped to PVCs 3-7

## W

- weight A-1, A-3
- write erase command B-24
- write memory command 3-3, B-24, C-4
- write terminal command B-24