Configuring Interfaces

This chapter describes the steps required to configure the physical interfaces on the ATM switch router. Your switch is configured as specified in your order and is ready for installation and startup when it leaves the factory.

Note This chapter provides advanced configuration instructions for the Catalyst 8540 MSR, Catalyst 8510 MSR, and LightStream 1010 ATM switch routers. For complete descriptions of the commands mentioned in this chapter, refer to the *ATM Switch Router Command Reference* publication. For hardware installation and cabling instructions, refer to the *ATM Port Adapter and Interface Module Installation Guide*.

Each port on the interface module or interface module physical interface can be configured to support the following clocking options:

- Self-timing based on a stratum 4 level clock
- Loop timing from the received data stream—ideal for public network connections
- Timing synchronized to a selected master clock port; required to distribute a single clock across a network

The plug-and-play mechanisms of the ATM switch router allow it to come up automatically. All configuration information for interface modules can be saved between hot swaps and switch router reboots. The switch router automatically discovers interface types and eliminates mandatory manual configuration.

When you upgrade your system, add components, or customize the initial configuration, refer to the following sections:

- Configuring 25-Mbps Interfaces (Catalyst 8510 MSR and LightStream 1010) on page 17-2
- Configuring 155-Mbps SM, MM, and UTP Interfaces on page 17-3
- Configuring OC-3c MMF Interfaces (Catalyst 8540 MSR) on page 17-5
- Configuring 622-Mbps SM and MM Interfaces on page 17-7
- Configuring OC-12c SM and MM Interfaces (Catalyst 8540 MSR) on page 17-9
- Configuring OC-48c SM and MM Interfaces (Catalyst 8540 MSR) on page 17-11
- Configuring DS3 and E3 Interfaces on page 17-13
- Configuring T1/E1 Trunk Interfaces on page 17-15
- Troubleshooting the Interface Configuration on page 17-17

Note   For hardware installation and cabling instructions, refer to the *ATM Port Adapter and Interface Module Installation Guide*. For complete descriptions of the commands mentioned in this chapter, refer to the *ATM Switch Router Command Reference* publication.

To configure the circuit emulation service (CES) T1 and E1 port adapters, refer to Chapter 18, "Configuring Circuit Emulation Services." To configure the Frame Relay E1 port adapters, refer to Chapter 19, "Configuring Frame Relay to ATM Interworking Port Adapter Interfaces." To configure the T1 and E1 inverse multiplexing over ATM (IMA) port adapters, refer to Chapter 20, "Configuring IMA Port Adapter Interfaces." To configure the ATM router modules, refer to Chapter 21, "Configuring ATM Router Module Interfaces."

Configuring 25-Mbps Interfaces (Catalyst 8510 MSR and LightStream 1010)

The ATM switch supports two types of 25-Mbps port adapters: a 4-port version and a 12-port version. The number of ports is determined by the type of cable used with the 25-Mbps port adapters. The cables have a 96-pin Molex connector with a multileg RJ-45 cable assembly. That is, multiple RJ-45 cables branch off from one large 96-pin Molex connector. You can choose either a 4-port version (with four RJ-45 cables) or a 12-port version (with 12 RJ-45 cables). Each 25.6-Mbps ATM port can be used for workgroup links. Each port complies with the ATM Forum PHY standard for 25.6 Mbps over twisted-pair cable.

The plug-and-play mechanisms of the ATM switch allow the switches to come up automatically. All configuration information for the port adapters can be saved between hot swaps and switch reboots, while interface types are automatically discovered by the switch, thereby eliminating mandatory manual configuration.

The ATM switch supports any combination of port adapters. You can configure your switch with up to 32 25-Mbps interface ports with the 4-port 25-Mbps port adapter, or up to 96 25-Mbps interface ports with the 12-port 25-Mbps port adapter.

Default 25-Mbps ATM Interface Configuration without Autoconfiguration (Catalyst 8510 MSR and LightStream 1010)

If ILMI is disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all 25-Mbps interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum VPI bits = 2
- Maximum VCI bits = 14
- ATM interface side = network
- ATM UNI type = private

For the 12-port 25-Mbps port adapter, the following parameters can be configured on physical ports 0 or 6. Parameters configured on port 0 apply to ports 0 to 5, and parameters configured on port 6 apply to ports 6 to 11. For the 4-port 25-Mbps port adapter, parameters configured on port 0 apply to ports 0 to 4:

- Output-queue
- Output-threshold
- CAC link sharing

Note   Pacing might not be configured on any physical port of the 25-Mbps port adapter.

Manual 25-Mbps Interface Configuration (Catalyst 8510 MSR and LightStream 1010)

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **interface atm** *card*/*subcard*/*port* Switch(config-if)#	Specifies an ATM interface and enters interface configuration mode.
Step 2	Switch(config-if)# **atm uni** [**side network**] [**type private**] [**version** {**3.0**	**3.1**	**4.0**}]	Modifies the ATM interface side, type, or version.
Step 3	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 4	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.

Example

The following example shows how to change the default ATM interface type to private, using the **atm uni type private** command:

```
Switch(config)# interface atm 0/0/0
Switch(config-if)# atm uni type private
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring 155-Mbps SM, MM, and UTP Interfaces

The 155-Mbps Synchronous Optical Network (SONET) Synchronous Transport Signal level 3/Synchronous Digital Hierarchy (STS3c/SDH) Synchronous Transport Module level 1 (STM1) port adapter, used for intercampus or wide-area links, has four ports.

155-Mbps Interface Configuration

You can configure any number and type of interfaces required, up to 64 155-Mbps interface ports on the Catalyst 8540 MSR and up to 32 155-Mbps interface ports on the Catalyst 8510 MSR and LightStream 1010 ATM switch routers.

Note   The 155-Mbps port adapter supports mixed mode. Port 0 is a single-mode interface and ports 1 through 3 are multimode interfaces.

The port adapter supports SC-type and unshielded twisted-pair (UTP) connectors, while receive and transmit LEDs on each port give quick, visual indications of port status and operation.

Traffic pacing allows the aggregate output traffic rate on any port to be set to a rate below the line rate. This feature is useful when communicating with a slow receiver or when connected to public networks with peak-rate tariffs.

Default 155-Mbps ATM Interface Configuration without Autoconfiguration

If Integrated Local Management Interface (ILMI) has been disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all 155-Mbps interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum virtual path identifier (VPI) bits = 8
- Maximum virtual channel identifier (VCI) bits = 14
- ATM interface side = network
- ATM UNI type = private
- Framing = sts-3c
- Clock source = network-derived
- Synchronous Transfer Signal (STS) stream scrambling = on
- Cell payload scrambling = on

Manual 155-Mbps Interface Configuration

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **interface atm** *card*/*subcard*/*port* Switch(config-if)#	Specifies an ATM interface and enters interface configuration mode.
Step 2	Switch(config-if)# **atm uni** [**side** {**network** | **user**}] [**type** {**private** | **public**}] [**version** {**3.0** | **3.1** | **4.0**}]	Modifies the ATM interface side, type, or version.

	Command	Purpose
Step 3	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 4	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.
Step 5	Switch(config-if)# **sonet** {**stm-1**	**sts-3c**}	Modifies the framing mode.
Step 6	Switch(config-if)# **clock source** {**free-running**	**loop-timed**	**network-derived**}	Modifies the clock source.
Step 7	Switch(config-if)# **scrambling** {**cell-payload**	**sts-stream**}	Modifies the scrambling mode.

Example

The following example configures ATM interface 3/1/1 as the network side of a private UNI running version 3.1.

```
Switch# interface atm 3/1/1
Switch(config-if)# no atm auto-configuration
Switch(config-if)#
%ATM-6ILMIOAUTOCFG: ILMI(ATM/0/0): Auto-configuration is disabled, current interface
parameters will be used at next interface restart.
Switch(config-if)# atm uni version 3.1
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring OC-3c MMF Interfaces (Catalyst 8540 MSR)

The 16-port OC-3c MMF interface module provides short-reach intercampus and WAN ATM connections. The OC-3c interface module provides an interface to ATM switching fabrics for transmitting and receiving data bidirectionally at up to 155 Mbps. The OC-3c interface module can support interfaces that connect to the OC-3c MMF STS-3c/STM1 physical layer.

The Catalyst 8540 MSR supports up to eight OC-3c interface modules per chassis, with a maximum of 128 OC-3c interface ports.

Note   You can configure traffic pacing on the interfaces to allow the aggregate output traffic rate on any interface to be set to a rate below the line rate. This feature is useful when communicating with a slow receiver or when connected to public networks with peak-rate tariffs.

Default OC-3c MMF Interface Configuration without Autoconfiguration (Catalyst 8540 MSR)

If Integrated Local Management Interface (ILMI) has been disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all OC-3c interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum virtual path identifier (VPI) bits = 8

- Maximum virtual channel identifier (VCI) bits = 14

- ATM interface side = network

- ATM UNI type = private

- Framing = sts-3c

- Clock source = network-derived

- Synchronous Transfer Signal (STS) stream scrambling = on

- Cell payload scrambling = on

Manual OC-3c MMF Interface Configuration (Catalyst 8540 MSR)

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **interface atm** *card*/*subcard*/*port* Switch(config-if)#	Specifies an ATM interface and enters interface configuration mode.
Step 2	Switch(config-if)# **atm uni** [**side** {**private** | **public**}] [**type** {**network** | **user**}] [**version** {**3.0** | **3.1** | **4.0**}]	Modifies the ATM interface side, type, or version.
Step 3	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 4	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.
Step 5	Switch(config-if)# **sonet** {**stm-1** | **sts-3c**}	Modifies the framing mode.
Step 6	Switch(config-if)# **clock source** {**free-running** | **loop-timed** | **network-derived**}	Modifies the clock source.
Step 7	Switch(config-if)# **scrambling** {**cell-payload** | **sts-stream**}	Modifies the scrambling mode.

Example

The following example configures ATM interface 3/0/1 as the network side of a private UNI running version 3.1.

```
Switch# interface atm 3/0/1
Switch(config-if)# no atm auto-configuration
Switch(config-if)#
%ATM-6-ILMINOAUTOCFG: ILMI(ATM3/0/1): Auto-configuration is disabled, current interface
parameters will be used at next interface restart.
Switch(config-if)# atm uni version 3.1
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring 622-Mbps SM and MM Interfaces

These interfaces are used for intercampus or wide-area links.

The 622-Mbps SONET STS12/SDH STM4 port adapter has a single port. You can configure your switch with only the number and type of interfaces required, with up to eight 622-Mbps interface ports.

Note   The configuration instructions in this section also apply to the ATM Fabric Integration Module.

The port adapter supports an SC-type connector, and receive and transmit LEDs give quick, visual indications of port status and operation.

Default 622-Mbps ATM Interface Configuration without Autoconfiguration

If ILMI has been disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all 622-Mbps interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum VPI bits = 8
- Maximum VCI bits = 14
- ATM interface side = network
- ATM UNI type = private
- Framing = sts-12c
- Clock source = network-derived
- STS stream scrambling = on
- Cell payload scrambling = on
- Reporting alarms = SF SLOS SLOF B1-TCA B2-TCA PLOP B3-TCA
- Path trace message = free format 64-byte string containing path information
- Scrambling = On
- BER thresholds: SF = 10e-3 SD = 10e-6
- TCA thresholds: B1 = 10e-6 B2 = 10e-6 B3 = 10e-6

Manual 622-Mbps Interface Configuration

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **interface atm** *card*/*subcard*/*port*[1] Switch(config-if)#	Specifies the ATM interface and enters interface configuration mode.
Step 2	Switch(config-if)# **atm uni** [**side** {**network** | **user**}] [**type** {**private** | **public**}] [**version** {**3.0** | **3.1** | **4.0**}]	Modifies the ATM interface side, type, or version.
Step 3	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 4	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.
Step 5	Switch(config-if)# **sonet** {**stm-4c** | **sts-12c**} or Switch(config-if)# **framing** {**stm-4c** | **sts-12c**}	Modifies the framing mode.
Step 6	Switch(config-if)# **clock source** {**free-running** | **loop-timed** | **network-derived**}	Modifies the clock source.
Step 7	Switch(config-if)# **sonet overhead** {**c2** *bytes* | **j0** {*bytes* | **msg** *line*} | **j1** {**16byte** {**exp-msg** *line* | **msg** *line*} | **64byte** {**exp-msg** *line* | **msg** *line*}} | **s1s0** *bits*}	Modifies the path trace message.
Step 8	Switch(config-if)# **sonet threshold** {**sd-ber** | **sf-ber** | **b1-tca** | **b2-tca** | **b3-tca**} *ber*	Modifies the bit error rate threshold value from 3 (10e-3) to 9 (10e-9).
Step 9	Switch(config-if)# **sonet report** {**slos** | **slof** | **lais** | **lrdi** | **pais** | **prdi** | **plop** | **sd-be**r | **sf-ber** | **b1-tca** | **b2-tca** | **b3-tca**}	Enables reporting of selected alarms.

1. The subcard for the full-width 622-Mbps interface module is always zero.

Examples

The following example shows how to change the default ATM interface type to **private** using the **atm uni type private** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# atm uni type private
```

The following example shows how to change the clock source using the **clock source network-derived** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# clock source network-derived
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring OC-12c SM and MM Interfaces (Catalyst 8540 MSR)

The 4-port OC-12c SM and MM interface modules provide either single-mode or multimode intermediate reach. The OC-12c interface module provides an interface to ATM switching fabrics for transmitting and receiving data bidirectionally at up to 622 Mbps. The OC-12c interface module can support interfaces that connect to the OC-12c SONET STS12/SDH STM4 physical layer.

These interfaces are used for intercampus or wide-area links.

✎
Note   The configuration instructions in this section also apply to the ATM Fabric Integration Module.

OC-12c Interface Configuration (Catalyst 8540 MSR)

The full-width four-port 622-Mbps is available in either a single-mode intermediate reach interface module or a new multimode module. You can configure your Catalyst 8540 MSR with only the number and type of interfaces required, up to 32 622-Mbps interface ports using the full-width interface module.

The interface module supports an SC-type connector, and receive and transmit LEDs give quick, visual indications of port status and operation.

Default OC-12c ATM Interface Configuration without Autoconfiguration (Catalyst 8540 MSR)

If ILMI has been disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all OC-12c interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum VPI bits = 8
- Maximum VCI bits = 14
- ATM interface side = network
- ATM UNI type = private
- Framing = sts-12c
- Clock source = network-derived
- STS stream scrambling = on
- Cell payload scrambling = on
- Reporting alarms = SF SLOS SLOF B1-TCA B2-TCA PLOP B3-TCA
- Path trace message = free format 64-byte string containing path information
- Scrambling = On
- BER thresholds: SF = 10e-3 SD = 10e-6
- TCA thresholds: B1 = 10e-6 B2 = 10e-6 B3 = 10e-6

Manual OC-12c Interface Configuration (Catalyst 8540 MSR)

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **interface atm** *card*/*subcard*/*port*[1] Switch(config-if)#	Specifies the ATM interface and enters interface configuration mode.
Step 2	Switch(config-if)# **atm uni** [**side** {**network**	**user**}] [**type** {**private**	**public**}] [**version** {**3.0**	**3.1**	**4.0**}]	Modifies the ATM interface side, type, or version.
Step 3	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 4	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.
Step 5	Switch(config-if)# **sonet** {**stm-4c**	**sts-12c**} or Switch(config-if)# **framing** {**stm-4c**	**sts-12c**}	Modifies the framing mode.
Step 6	Switch(config-if)# **clock source** {**free-running**	**loop-timed**	**network-derived**}	Modifies the clock source.
Step 7	Switch(config-if)# **sonet overhead** {**c2** *bytes*	**j0** {*bytes*	**msg** *line*}	**j1** {**16byte** {**exp-msg** *line*	**msg** *line*}	**64byte** {**exp-msg** *line*	**msg** *line*}}	**s1s0** *bits*}	Modifies the path trace message.
Step 8	Switch(config-if)# **sonet threshold** {**sd-ber**	**sf-ber**	**b1-tca**	**b2-tca**	**b3-tca**} *ber*	Modifies the bit error rate threshold value from 3 (10e-3) to 9 (10e-9).
Step 9	Switch(config-if)# **sonet report** {**slos**	**slof**	**lais**	**lrdi**	**pais**	**prdi**	**plop**	**sd-be**r	**sf-ber**	**b1-tca**	**b2-tca**	**b3-tca**}	Enables reporting of selected alarms.

1.   The subcard for the full-width 622-Mbps interface module is always zero.

Examples

The following example shows how to change the default ATM interface type to **private** using the **atm uni type private** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# atm uni type private
```

The following example shows how to change the clock source using the **clock source network-derived** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# clock source network-derived
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring OC-48c SM and MM Interfaces (Catalyst 8540 MSR)

The Catalyst 8540 MSR supports the following three OC-48c SM and MM intermediate reach fiber interface modules:

- 1-port OC-48c single-mode intermediate reach *plus* 4-port OC-12 single-mode fiber
- 1-port OC-48c single-mode intermediate reach *plus* 4-port OC-12 multimode fiber
- 2-port OC-48c single-mode intermediate reach
- 1-port OC-48c single-mode long reach *plus* 4-port OC-12 single-mode fiber
- 2-port OC-48c single-mode long reach

Each OC-48c interface module occupies a slot pair. For example, install an OC-48c interface module in slots 0 and 1, 2 and 3, 9 and 10, or 11 and 12. The chassis supports a maximum of four OC-48c interface modules. A maximum configuration provides up to four OC-48c ports and 16 OC-12 ports or up to eight OC-48c ports. The OC-48c interface module supports a dual SC-type connector. Refer to your hardware installation guide for more information.

The OC-48c interface module is used for intercampus or wide-area links. This interface module is functionally similar to the current OC-3c and OC-12c interfaces, but operates at a faster speed. OC-48c supports both UNI and NNI as well as all framing options.

Default OC-48c ATM Interface Configuration Without Autoconfiguration (Catalyst 8540 MSR)

If ILMI is disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all OC-48c interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum VPI bits = 8
- Maximum VCI bits = 14
- ATM interface side = network
- ATM UNI type = private
- Framing = sts-48c
- Loopback = no loopback
- STS stream scrambling = on
- Cell payload scrambling = on
- Clock source = network-derived
- Reporting alarms enabled = SF SLOS SLOF B1-TCA B2-TCA PLOP B3-TCA
- Path trace message = free format 64-byte string containing path information
- Bit error rate (BER) thresholds: SF = 10e-3, SD = 10e-6
- TCA thresholds: B1 = 10e-6, B2 = 10e-6, B3 = 10e-6

Manual OC-48c Interface Configuration (Catalyst 8540 MSR)

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **interface atm** *card*/*subcard*/*port* Switch(config-if)#	Specifies the ATM interface and enters interface configuration mode.
Step 2	Switch(config-if)# **atm uni** [**side** {**network** | **user**}] [**type** {**private** | **public**}] [**version** {**3.0** | **3.1** | **4.0**}]	Modifies the ATM interface side, type, or version.
Step 3	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 4	Switch(config-if)# **atm maxvci-bits** *max-vci-bit***s**	Modifies the maximum VCI bits configuration.
Step 5	Switch(config-if)# **sonet** {**stm-16** | **sts-48c**}	Modifies the framing mode.
Step 6	Switch(config-if)# **clock source** {**free-running** | **loop-timed network-derived**}	Modifies the clock source.
Step 7	Switch(config-if)# **sonet overhead** {**c2** *bytes* | **j0** {*bytes* | **msg** *line*} | **j1** {**16byte** {**exp-msg** *line* | **msg** *line*} | **64byte** {**exp-msg** *line* | **msg** *line*}} | **s1s0** *bits*}	Modifies the path trace message.
Step 8	Switch(config-if)# **sonet threshold** {**sd-ber** | **sf-ber** | **b1-tca** | **b2-tca** | **b3-tca**} *ber*	Modifies the BER threshold values.
Step 9	Switch(config-if)# **sonet report** {**slos** | **slof** | **lais** | **lrdi** | **pais** | **prdi** | **plop** | **sd-ber** | **sf-ber** | **b1-tca** | **b2-tca** | **b3-tca**}	Enables reporting of selected alarms.

Example

The following example shows how to change the number of active VCI bits to 12:

```
Switch(config)# interface atm 9/0/0
Switch(config-if)# atm max-vci-bits 12
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring DS3 and E3 Interfaces

The 45-Mbps DS3 and the 34-Mbps E3 port adapters are used for wide-area connections, to link multiple campuses, or to connect to public networks.

DS3 and E3 Interface Configuration

You can configure your switch router with only the number and type of interfaces required, with up to 64 DS3 or E3 interface ports on the Catalyst 8540 MSR and up to 32 DS3 or E3 interface ports on the Catalyst 8510 MSR and LightStream 1010 ATM switch router.

Traffic-pacing allows the aggregate output traffic rate on any port to be set to a rate below the line rate. This feature is useful when communicating with a slow receiver or when connected to public networks with peak-rate tariffs.

✎
Note Network clocking configuration options are applicable only to DS3 quad interfaces.

Default DS3 and E3 ATM Interface Configuration without Autoconfiguration

If ILMI has been disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all DS3 or E3 interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum VPI bits = 8
- Maximum VCI bits = 14
- ATM interface side = network
- ATM UNI type = private

The following defaults are assigned to all DS3 port adapter interfaces:

- Framing = cbit-adm
- Cell payload scrambling = off
- Clock source = network-derived
- LBO = short
- Auto-ferf on loss of signal (LOS)= on
- Auto-ferf on out of frame (OOF)= on
- Auto-ferf on red = on
- Auto-ferf on loss of cell delineation (LCD)= on
- Auto-ferf on alarm indication signal (AIS)= on

The following defaults are assigned to all E3 port adapter interfaces:

- Framing = g.832 adm
- Cell payload scrambling = on
- Clock source = network-derived

- Auto-ferf on LOS = on

- Auto-ferf on OOF = on

- Auto-ferf on LCD = on (applicable to nonplcp mode only)

- Auto-ferf on AIS = on

Manual DS3 and E3 Interface Configuration

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **network-clock-select** *priority* **atm** *card/subcard/port*	Configures the network-derived clock.
Step 2	Switch(config)# **interface atm** *card/subcard/port* Switch(config-if)#	Specifies an ATM interface and enters interface configuration mode.
Step 3	Switch(config-if)# **atm uni** [**side** {**private** | **public**} **type** {**network** | **user**} **version** {**3.0** | **3.1** | **4.0**}]	Modifies the ATM interface side, type, or version.
Step 4	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 5	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.
Step 6	Switch(config-if)# **framing** {**cbitadm** | **cbitplcp** | **m23adm** | **m23plcp**}	Modifies the framing mode.
Step 7	Switch(config-if)# **scrambling** {**cell-payload** | **sts-stream**}	Modifies the scrambling mode.
Step 8	Switch(config-if)# **clock source** {**free-running** | **loop-timed** | **network-derived**}	Modifies the clock source.
Step 9	Switch(config-if)# **lbo** {**long** | **short**}	Modifies the line build-out.
Step 10	Switch(config-if)# **auto-ferf** {**ais** | **lcd** | **los** | **oof** | **red**}	Modifies the auto-ferf configuration.

Examples

The following example shows how to change the default ATM interface type to **private** using the **atm uni type private** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# atm uni type private
```

The following example shows how to change the clock source using the **clock source network-derived** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# clock source network-derived
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Configuring T1/E1 Trunk Interfaces

The T1 and E1 trunk port adapters, used for intercampus or wide-area links, have four ports.

T1/E1 Trunk Interface Configuration

The ATM switch router supports any combination of port adapters. You can configure your switch router with only the number and type of interfaces required, with up to 64 T1 or E1 interface ports on the Catalyst 8540 MSR and up to 32 T1 or E1 interface ports on the Catalyst 8510 MSR and LightStream 1010 ATM switch routers.

The port adapter supports SC-type and BNC connectors while receive and transmit LEDs on each port give quick, visual indications of port status and operation.

Traffic-pacing allows the aggregate output traffic rate on any port to be set to a rate below the line rates. This feature is useful when communicating with a slow receiver or when connected to public networks with peak-rate tariffs.

Default T1 and E1 ATM Interface Configuration without Autoconfiguration

If ILMI is disabled or if the connecting end node does not support ILMI, the following defaults are assigned to all T1 and E1 interfaces:

- ATM interface type = UNI
- UNI version = 3.0
- Maximum VPI bits = 8
- Maximum VCI bits = 14
- ATM interface side = network
- ATM UNI type = private

The following port adapter types have specific defaults assigned.

T1 port adapter:

- Framing = ESF
- Line coding = B8ZS
- Cell payload scrambling = off
- Clock source = network-derived
- LBO = 0 to 110 feet
- Auto-ferf on loss of signal (LOS) = on
- Auto-ferf on out of frame (OOF) = on
- Auto-ferf on red = on
- Auto-ferf on loss of cell delineation (LCD) = on

- Auto-ferf on alarm indication signal (AIS) = on

E1 port adapter:

- Framing = g.832 adm

- Line coding = HDB3

- Cell payload scrambling = off

- Clock source = network-derived

- Auto-ferf on LOS = on

- Auto-ferf on OOF = on

- Auto-ferf on red = on

- Auto-ferf on LCD = on

- Auto-ferf on AIS = on

Manual T1 and E1 Interface Configuration

To manually change any of the default configuration values, perform the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	Switch(config)# **network-clock-select** *priority* **atm** *card*/*subcard*/*port*	Configures the network-derived clock.
Step 2	Switch(config)# **interface atm** *card*/*subcard*/*port* Switch(config-if)#	Specifies an ATM interface and enters interface configuration mode.
Step 3	Switch(config-if)# **atm uni** [**side** {**private** | **public**}] [**type** {**network** | **user**}] [**version** {**3.0** | **3.1** | **4.0**}]	Modifies the ATM interface side, type, or version.
Step 4	Switch(config-if)# **atm maxvpi-bits** *max-vpi-bits*	Modifies the maximum VPI bits configuration.
Step 5	Switch(config-if)# **atm maxvci-bits** *max-vci-bits*	Modifies the maximum VCI bits configuration.
Step 6	Switch(config-if)# **framing** {**esfadm** | **esfplcp** | **sfadm** | **sfplcp**} Switch(config-if)# **framing** {**crc4adm** | **crc4plcp** | **pcm30adm pcm30plcp**}	Modifies the T1 framing mode. Modifies the E1 framing mode.
Step 7	Switch(config-if)# **linecode** {**ami** | **b8zs**} Switch(config-if)# **linecode** {**ami** | **hdb3**}	Modifies the T1 line coding. Modifies the E1 line coding.
Step 8	Switch(config-if)# **scrambling** {**cell-payload** | **sts-stream**}	Modifies the scrambling mode.
Step 9	Switch(config-if)# **clock source** {**free-running** | **loop-timed** | **network-derived**}	Modifies the clock source.

	Command	Purpose
Step 10	Switch(config-if)# **lbo** {**0_110** | **110_220** | **220_330** | **330_440** | **440_550** | **550_600** | **gt_600**}	Modifies the line build-out.
Step 11	Switch(config-if)# **auto-ferf** {**ais** | **lcd** | **los** | **oof** | **red**}	Modifies the auto-ferf configuration.

Examples

The following example shows how to change the default ATM interface type to **private** using the **atm uni type private** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# atm uni type private
```

The following example shows how to change the clock source using the **clock source network-derived** command:

```
Switch# configure terminal
Switch(config)# interface atm 0/0/0
Switch(config-if)# clock source network-derived
```

Refer to the "Troubleshooting the Interface Configuration" section on page 17-17 to confirm your interface configuration.

Troubleshooting the Interface Configuration

Table 17-1 describes commands that you can use to confirm that the hardware, software, and interfaces for the ATM switch router are configured as intended:

Table 17-1   Configuration Testing Commands

Command	Purpose
show version	Confirms the correct version and type of software installed.
show hardware	Confirms the type of hardware installed in the system.
show interfaces	Confirms the type of hardware installed in the system.
show atm addresses	Confirms the correct configuration of the ATM address.
ping atm	Tests for connectivity between the switch and a host.
show {**atm** | **ces**} **interface**	Confirms the correct configuration of the ATM interfaces.
show atm status	Confirms the status of the ATM interfaces.
show atm vc	Confirms the status of ATM virtual interfaces.
show running-config	Confirms the correct configuration.
show startup-config	Confirms the correct configuration saved in NVRAM.
show controllers {**atm** | **ethernet**}	Confirms interface controller memory addressing.