atm txbuff

To set the maximum number of transmit buffers for simultaneous packet fragmentation, use the **atm txbuff** interface configuration command. To restore the default value, use the **no** form of this command.

atm txbuff *number*

no atm txbuff

Syntax Description

number	Maximum number of packet fragmentations that the ATM Interface Processor (AIP) can perform simultaneously, from 0 to 512.

Defaults

256

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command is supported on the AIP for Cisco 7500 series routers. This command is not supported on the ATM port adapter for Cisco 7200 and 7500 series routers, nor is it supported on Cisco 4500 and Cisco 4700 routers.

Examples

The following example configures the AIP to perform up to 300 packet fragmentations simultaneously:

```
atm txbuff 300
```

atm uni-version

To specify the User-Network Interface (UNI) version (3.0 or 3.1) the router should use when Interim Local Management Interface (ILMI) link autodetermination is unsuccessful or ILMI is disabled, use the **atm uni-version** interface configuration command. To restore the default value to 3.0, use the **no** form of this command.

atm uni-version *version-number*

no atm uni-version *version-number*

Syntax Description

version-number	UNI version selected on an interface. Valid values are 3.0 and 3.1.

Defaults

Version 3.0

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Normally, when the ILMI link autodetermination is enabled on the interface and is successful, the router accepts the UNI version returned by ILMI. If the ILMI link autodetermination is unsuccessful or ILMI is disabled, the UNI version defaults to 3.0. You can override the default UNI version by using this command to enable UNI 3.1 signalling support. The **no** form of the command sets the UNI version to one returned by ILMI if ILMI is enabled and the link autodetermination process is successful. Otherwise, the UNI version reverts to 3.0.

Examples

The following example specifies UNI version 3.1 signalling port on the ATM interface 2/0:

```
interface atm 2/0
 atm uni-version 3.1
```

atm vc-per-vp

To set the maximum number of virtual channel identifier (VCIs) to support per virtual path identifier (VPI), use the **atm vc-per-vp** interface configuration command. To restore the default value, use the **no** form of this command.

atm vc-per-vp *number*

no atm vc-per-vp

Syntax Description

number	Maximum number of VCIs to support per VPI. See the following list for valid values: • **AIP for Cisco 7500 series**—Valid values are 16, 32, 64, 128, 256, 512, and 1024. • **ATM port adapter for Cisco 7200 series and 7500 series**—Valid values are 16, 32, 64, 128, 256, 512, 1024, and 2048. • **NPM for Cisco 4500 and Cisco 4700 routers**—Valid values are 32, 64, 128, 256, 512, 1024, 2048, 4096, and 8192. • **Network module with IMA for the Cisco 2600 series and 3600 series**—Valid values are 256, 512, and 1024.

Defaults

1024

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command controls the memory allocation in the ATM Interface Processor (AIP), ATM port adapter, ATM network module, or network processor module (NPM) to deal with the VCI table.

An invalid VCI causes a warning message to be displayed.

Cisco 2600 and 3600 series with IMA

Note For Cisco 2600 and 3600 series with IMA, changing the value of the **atm vc-per-vp** command on one interface affects all of the interfaces on that network module.

Table 3 lists the possible VCI ranges and corresponding VPI ranges for the Cisco 2600 and 3600 series with IMA.

Table 3 VCI and VPI Ranges for Cisco 2600 and 3600 Series with IMA

VCI Range	VPI Range
0–255	0–15, 64–79, 128–143, and 192–207
0–511	0–15, 64–79
0–1023	0–15

Examples

The following example sets the maximum number of VCIs per VPI to 512:

```
atm vc-per-vp 512
```

Related Commands

Command	Description
pvc	Configures the PVC interface.

atm vp-filter

To set the ATM Interface Processor (AIP) filter register, use the **atm vp-filter** interface configuration command. To restore the default value, use the **no** form of this command.

atm vp-filter *hexvalue*

no atm vp-filter

Syntax Description

hexvalue	Value in hexadecimal format.

Defaults

0x7B

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command is supported on Cisco 7500 series routers, but not on Cisco 4500 and Cisco 4700 routers. This command is not supported on ATM port adapters.

This command allows you to specify a virtual path identifier (VPI) or range of VPIs to be used for ATM adaptation layer 3/4 (AAL3/4) processing. All other VPIs map to AAL5 processing. If only AAL5 processing is required, you can either let the virtual path filter default or set it to an arbitrary VPI so that AAL5 processing is performed on all VPIs.

This command configures the hexadecimal value used in the virtual path filter register in the reassembly operation. The virtual path filter comprises 16 bits. The virtual path filter register uses the most significant bits (bits 15 through 8, the left half of the filter) as mask bits, and uses bits 7 through 0 (the right half of the filter) as compare bits.

When a cell is received, the right half of the filter is exclusively NORed with the binary value of the incoming VPI. The result is then ORed with the left half of the filter (the mask). If the result is all 1s, then reassembly is done using the VCI/message identifier (MID) table (AAL3/4 processing). Otherwise, reassembly is done using the VPI-VCI pair table (AAL5 processing).

Examples

In the following example, all incoming cells are reassembled using AAL3/4 processing:

```
atm vp-filter ff00
```

In the following example, all incoming cells with the virtual path equal to 0 are reassembled using AAL3/4 processing; all other cells are reassembled using AAL5 processing:

```
atm vp-filter 0
```

In the following example, all incoming cells with the most significant bit of the virtual path set are reassembled using AAL3/4 processing; all other cells are reassembled using AAL5 processing:

```
atm vp-filter 7f80
```

broadcast

To configure broadcast packet duplication and transmission for an ATM virtual circuit (VC) class, permanent virtual circuit (PVC), switched virtual circuit (SVC), or VC bundle, use the **broadcast** command in the appropriate command mode. To disable transmission of broadcast packets for your ATM VC class, PVC, SVC, or VC bundle, use the **no** form of this command. To restore the default behavior according to the description in the following "Usage Guidelines" section, use the **default** form of this command.

broadcast

no broadcast

default broadcast

Syntax Description

This command has no arguments or keywords.

Defaults

Disabled. For classical IP SVCs, broadcast is enabled.

Command Modes

Interface-ATM-VC configuration (for ATM PVCs and SVCs)

VC-class configuration (for a VC-class)

Bundle configuration (for a VC bundle)

PVC range configuration (for an ATM PVC range)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3 T	This command was introduced.
12.0(3)T	Enhancements were added for configuration of broadcast packet duplication and transmission for an ATM VC bundle.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.

Usage Guidelines

If broadcasting and multipoint signalling are enabled on an SVC, a multipoint SVC will be created to handle the SVC.

Note If you use the **broadcast** command to configure broadcasting for an ATM PVC or SVC, VC-class, or VC bundle, this configuration takes precedence over any previous configuration using the **broadcast** command.

If the **broadcast** command is not explicitly configured on an ATM PVC, SVC, or VC bundle, the VC inherits the following default configuration (listed in order of precedence):

- Configuration of the **broadcast** command in a VC class assigned to the PVC, SVC, or VC bundle itself.
- Configuration of the **broadcast** command in a VC class assigned to the PVC's, SVC's, or VC bundle's ATM subinterface.
- Configuration of the **broadcast** command in a VC class assigned to the PVC's, SVC's, or VC bundle's ATM main interface.

Note When a VC is a member of a VC bundle, configuration using the **broadcast** command in VC-class configuration mode no longer applies to the VC. Bundle configuration takes precedence.

To use the **broadcast** command in bundle configuration mode, enter the **bundle** command to enact bundle configuration mode for the bundle for which you want to enable broadcast forwarding.

Examples

The following example enables the transmission of broadcast packets on an ATM PVC named router5:

```
pvc router5 1/32
 broadcast
```

The following example enables the transmission of broadcast packets on an ATM PVC bundle named chicago:

```
bundle chicago
 broadcast
```

Related Commands

Command	Description
class-int	Assigns a VC class to an ATM main interface or subinterface.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
encapsulation	Sets the encapsulation method used by the interface.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC bundle.
oam-bundle	Enables end-to-end F5 OAM loopback cell generation and OAM management for a virtual circuit class that can be applied to a virtual circuit bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).
ubr	Configures UBR QoS and specifies the output peak cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
ubr+	Configures UBR QoS and specifies the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
vbr-nrt	Configures the VBR-NRT QoS and specifies output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, VC class, or VC bundle member.

cbr

To configure the constant bit rate (CBR) for the ATM circuit emulation service (CES) for an ATM permanent virtual circuit (PVC) on the Cisco MC3810, use the **cbr** command in the appropriate configuration mode. To restore the default, use the **no** form of this command.

cbr *rate*

no cbr *rate*

Syntax Description

rate	Constant bit bate (also known as the average cell rate) for ATM CES. The valid range for this command is from 56 to 10,000 kbps on the Cisco MC3810.

Defaults

The CBR is not configured.

Command Modes

Interface-ATM-VC configuration (for ATM PVCs and SVCs)

PVC range configuration (for an ATM PVC range)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
12.0	This command was introduced.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.

Usage Guidelines

This command applies to ATM configuration on the Cisco MC3810.

Examples

The following example configures the constant bit rate on ATM PVC 20 on the Cisco MC3810:

```
pvc 20
 cbr 56
```

Related Commands

Command	Description
ces cell-loss-integration-period	Sets the CES cell-loss integration period on the Cisco MC3810 multiservice concentrator.
ces clockmode synchronous	Configures the ATM CES synchronous clock mode on the Cisco MC3810 multiservice concentrator.
ces connect	Maps the CES service to an ATM PVC on the Cisco MC3810 multiservice concentrator.

Command	Description
ces initial-delay	Configures the size of the receive buffer of a CES circuit on the Cisco MC3810 multiservice concentrator.
ces max-buf-size	Configures the send buffer of a CES circuit on the Cisco MC3810 multiservice concentrator.
ces partial-fill	Configures the number of user octets per cell for the ATM CES on the Cisco MC3810 multiservice concentrator.
ces service	Configures the ATM CES type on the Cisco MC3810 multiservice concentrator.
encapsulation atm-ces	Enables CES ATM encapsulation on the Cisco MC3810 multiservice concentrator.

ces

To configure Circuit Emulation Service (CES) on a router port and enter CES configuration mode, use the **ces** global configuration command.

ces *slot/port*

Syntax Description

slot/port	Backplane slot number and port number on the interface. The port value is always 0 as the interface configuration applies to all ports in the slot.

Defaults

No CES interface is configured.

Command Modes

Global configuration

Command History

Release	Modification
12.1(2)T	This command was introduced.

Usage Guidelines

This command is used on Cisco 2600 series and 3600 series routers that have OC-3/STM-1 ATM CES network modules.

The **ces** command enters CES configuration mode. Use CES configuration mode to configure CES parameters such as the CES clock.

Examples

The following example configures the CES interface in slot 2:

```
ces 2/0
```

Related Commands

Command	Description
clock-select	Allows the selection of clock sources and priority.

ces aal1 clock

To configure the ATM adaptation layer 1 (AAL1) timing recovery clock for the constant bit rate (CBR) interface, use the **ces aal1 clock** interface configuration command. To return the clock to the default, use the **no** form of this command.

ces aal1 clock {**adaptive** | **srts** | **synchronous**}

no ces aal1 clock

Syntax Description

adaptive	Adjusts output clock on a received AAL1 on FIFO basis. Use in unstructured mode.
srts	Sets the clocking mode to synchronous residual time stamp.
synchronous	Configures the timing recovery to synchronous for structured mode.

Defaults

synchronous

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

The clock mode must be **synchronous** for structured mode. In unstructured mode, use the **adaptive** keyword when a network-derived clock is not available.

Use the **srts** keyword when a network-derived clock is available but devices attached to the CES port use a different clock reference. The **srts** keyword samples the incoming clock, subtracts from the network clock, and sends the remainder in an AAL1 header. The clock is reconstructed during output by adding the residual to the network reference.

Use the **synchronous** keyword for all other modes.

Examples

The following command sets the AAL1 timing recovery clock to adaptive mode:

```
interface cbr 4/0
 ces aal1 clock adaptive
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
ces dsx1 clock source	Configures a transmit clock source for the CBR interface.
network-clock-select (ATM)	Establishes the sources and priorities of the requisite clocking signals for an ATM-CES port adapter.

ces aal1 service

To configure the type of circuit emulation service used on the constant bit rate (CBR) interface, use the **ces aal1 service** interface configuration command. To return the type of service to unstructured, use the **no** form of this command.

ces aal1 service {**structured** | **unstructured**}

no ces aal1 service

Syntax Description

structured	Sets the type of service to structured (cross-connect).
unstructured	Sets the type of service to unstructured (clear-channel).

Defaults

unstructured

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

The **structured** keyword means that each time slot is an independent entity grouped into circuits, where each circuit has an independent permanent virtual circuit (PVC).

The **unstructured** keyword reduces the incoming serial data on the receiving end of the ATM network. The keyword also sets the service to single circuit, single PVC, where all time slots are carried.

Examples

The following example changes the mode for the **ces aal1 service** command to structured:

```
interface cbr 4/0
 ces aal1 service structured
```

Related Commands

Command	Description
ces aal1 clock	Configures the AAL1 timing recovery clock for the CBR interface.
ces circuit	Configures the connection attributes for the CBR interface.
ces dsx1 clock source	Configures a transmit clock source for the CBR interface.
ces dsx1 framing	Selects the frame type for the data line on the CBR interface.
ces dsx1 lbo	Configures cable length for the CBR interface.
ces dsx1 linecode	Selects the line code type for the CBR interface.
ces dsx1 loopback	Enables a loopback for the CBR interface.
ces dsx1 signalmode robbedbit	Enables the signal mode as robbed bit on a CBR interface.

Command	Description
ces pvc	Configures the destination port for the circuit on the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces-cdv

To set the cell delay variation, use the **ces-cdv** interface-ATM-VC configuration command.

ces-cdv *time*

Syntax Description

time	Maximum tolerable cell arrival jitter with a range of 1 to 65535 microseconds.

Defaults

5000 microseconds

Command Modes

Interface-ATM-VC configuration

Command History

Release	Modification
12.1(2)T	This command was introduced.

Usage Guidelines

This command is used on Cisco 2600 series and 3600 series routers that have OC-3/STM-1 ATM CES network modules.

Examples

The following example configures the maximum tolerable cell arrival jitter at 7500 microseconds:

```
interface atm1/0
 pvc 0 0/41 ces
  ces-cdv 7500
```

Related Commands

Command	Description
interface atm	Configures the ATM interface.
svc	Configures the SVC.

ces circuit

To configure the connection attributes for the constant bit rate (CBR) interface, use the **ces circuit** interface configuration command. To return the connection attributes to the default or to enable the circuit, use the **no** form of this command.

ces circuit *circuit-number* [**cas**] [**cdv** *range*] [**circuit-name** *name*] [**on-hook-detection** *hex-number*] [**partial-fill** *range*] [**shutdown**] [**timeslots** *range*]

no ces circuit *circuit-number* [**cas**] [**cdv** *range*] [**circuit-name** *name*] [**on-hook-detection** *hex-number*] [**partial-fill** *range*] [**shutdown**] [**timeslots** *range*]

Syntax Description

circuit-number	Selects the circuit identification. For unstructured service, use 0. For T1 structured service, the range is 1 through 24. For E1 structure service, the range is 1 through 31.
cas	(Optional) Enables channel-associated signalling for structured service only. The default is **no cas**.
cdv *range*	(Optional) Enables the peak-to-peak cell delay variation requirement. The range for CDV is 1 through 65535 milliseconds. The default is 2000 milliseconds.
circuit-name *name*	(Optional) Sets the ASCII name for the circuit emulation service internetworking function CES-IWF circuit. The string for the circuit name is 0 through 255. The default is CBRx/x:0.
on-hook-detection *hex-number*	(Optional) Enables detection of whether the circuit is on-hook. Hex values are 0 through F to indicate a 2- or 4-bit AB[CD] pattern to detect on-hook. The AB[CD] bits are determined by the manufacturer of the voice/video telephony device that is generating the CBR traffic.
partial-fill *range*	(Optional) Enables the partial AAL1 cell fill service for structured service only. The range is 0 through 47. The default is 47.
shutdown	(Optional) Marks the CES-IWF circuit administratively down. The default is **no shutdown**.
timeslots *range*	(Optional) Configures the time slots for the CES-IWF circuit for structured service only. The range is 1 through 24 for T1. The range is 1 through 31 for E1.

Defaults

No circuit is configured.

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Channel-associated signalling (CAS) provides information about the time slot (on or off the hook) and is updated once per multiframe.

With both the CAS and on-hook detection features enabled, these features work together to enable an ingress node in an ATM network to monitor on-hook and off-hook conditions for a specified 1 x 64 structured CES circuit. As implied by the notation "1 x 64," the on-hook detection (or bandwidth-release) feature is supported only in a structured CES circuit that involves a single time slot at each end of the connection.

The time slot configured for the structured CES circuit at the ingress node (time slot 2) can be different from the DS0 time slot configured at the egress node (time slot 4). Only one such time slot can be configured at each end of the circuit when the on-hook detection feature is used.

When you invoke the on-hook feature, the ingress ATM-CES port adapter monitors the ABCD bits in the incoming CBR bit stream to detect on-hook and off-hook conditions in the circuit. In an "off-hook" condition, all the bandwidth provisioned for the specified CES circuit is used for transporting ATM AAL1 cells across the network from the ingress node to the egress node.

In an on-hook condition, the network periodically sends dummy ATM cells from the ingress node to the egress node to maintain the connection. However, these dummy cells consume only a fraction of the circuit's reserved bandwidth, leaving the rest of the bandwidth available for use by other network traffic. This bandwidth-release feature enables the network to make more efficient use of its resources.

When the CAS feature is enabled for a CES circuit, the bandwidth of the DS0 channel is limited to 56 kbps for user data, because CAS functions consume 8 kbps of channel bandwidth for transporting the ABCD signalling bits. These signalling bits are passed transparently from the ingress node to the egress node as part of the ATM AAL1 cell stream.

In summary, when the optional CAS and on-hook detection features are enabled, the following conditions apply:

- The permanent virtual connection (PVC) provisioned for the CES circuit always exists.
- The bandwidth for the CES circuit is always reserved.
- During an on-hook state, most of the bandwidth reserved for the CES circuit is not in use. (Dummy cells are sent from the ingress node to the egress node to maintain the connection.) Therefore, this bandwidth becomes available for use by other network traffic, such as available bit rate (ABR) traffic.
- During an off-hook state, all the bandwidth reserved for the CES circuit is dedicated to that circuit.

Examples

The following example sets the structured service CDV range to 5000 milliseconds and enables the interface:

```
interface cbr 4/0
 ces circuit 3 cdv 5000
 ces circuit 3 no shutdown
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.

Command	Description
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces dsx1 clock source

To configure a transmit clock source for the constant bit rate (CBR) interface, use the **ces dsx1 clock source** interface configuration command. To return the clock source to the default, use the **no** form of this command.

ces dsx1 clock source {**loop-timed** | **network-derived**}

no ces dsx1 clock source

Syntax Description

loop-timed	Configures the transmit clock to loop (RX-clock to TX-clock).
network-derived	Configures the transmit clock to be derived from the network.

Defaults

network-derived

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Examples

The following example sets the clock source to loop-timed:

```
interface cbr 4/0
 ces dsx1 clock source loop-timed
```

Related Commands

Command	Description
ces aal1 clock	Configures the AAL1 timing recovery clock for the CBR interface.
ces aal1 service	Configures the type of CES used on the CBR interface.
network-clock-select (ATM)	Establishes the sources and priorities of the requisite clocking signals for an ATM-CES port adapter.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces dsx1 framing

To select the frame type for the data line on the constant bit rate (CBR) interface, use the **ces dsx1 framing** interface configuration command. To return the frame type to the default, use the **no** form of this command.

T1

ces dsx1 framing {**esf** | **sf**}

no ces dsx1 framing

E1

ces dsx1 framing {**e1_crc_mfCASlt** | **e1_crc_mf_lt** | **e1_lt** | **e1_mfCAS_lt**}

no ces dsx1 framing

Syntax Description

esf	Configures the line type to extended super frame for T1.
sf	Configures the line type to super frame for T1.
e1_crc_mfCASlt	Configures the line type to E1 CRC with channel-associated signalling (CAS) enabled.
e1_crc_mf_lt	Configures the line type to E1 CRC with CAS disabled.
e1_lt	Configures the line type to E1 with CAS disabled.
e1_mfCAS_lt	Configures the line type to E1 with CAS enabled.

Defaults

esf (for T1)

e1_lt (for E1)

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Use this command in configurations where the router communicates with the data line. The service provider determines which framing type is required for your circuit.

Examples

The following example sets the data line type to super frame:

```
interface cbr 4/0
 ces dsx1 framing sf
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces dsx1 lbo

To configure cable length for the constant bit rate (CBR) interface, use the **ces dsx1 lbo** interface configuration command. To return the cable length to the default, use the **no** form of this command.

ces dsx1 lbo *length*

no ces dsx1 lbo

Syntax Description

length	Sets the cable length. Values (in feet) are **0_110**, **110_200**, **220_330**, **330_440**, **440_550**, **550_660**, **660_above**, and **square_pulse**. Values represent a range in feet.

Defaults

0_110 feet

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Set the cable length to the desired number of feet on your system.

Examples

The following example sets the cable length to 440 feet:

```
interface cbr 4/0
 ces dsx1 lbo 440_550
```

Related Commands

Command	Description
atm lbo	Specifies the cable length (line build-out) for the ATM interface.
ces aal1 service	Configures the type of CES used on the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces dsx1 linecode

To select the line code type for the constant bit rate (CBR) interface, use the **ces dsx1 linecode** interface configuration command. To return the line code to the default, use the **no** form of this command.

T1

ces dsx1 linecode {**ami** | **b8zs**}

no ces dsx1 linecode

E1

ces dsx1 linecode {**ami** | **hdb3**}

no ces dsx1 linecode

Syntax Description

ami	Specifies the alternate mark inversion (AMI) as the line code type. Valid for T1 and E1 interfaces.
b8zs	Specifies B8ZS as the line code type. Valid for T1 interfaces. This is the default for T1.
hdb3	Specifies HDB3 as the line code type. Valid for E1 interfaces. This is the default for E1.

Defaults

b8zs (for T1)

hdb3 (for E1)

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Use this command in configurations where the switch communicates with the data line. The service provider determines which line code type is required for your circuit.

Examples

The following example specifies B8ZS as the line code type:

```
interface cbr 4/0
 ces dsx1 linecode b8zs
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.

Command	Description
show ces interface cbr	Displays detailed CBR port information.
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces dsx1 loopback

To enable a loopback for the constant bit rate (CBR) interface, use the **ces dsx1 loopback** interface configuration command. To disable the loopback, use the **no** form of this command.

ces dsx1 loopback {**line** | **noloop** | **payload**}

no ces dsx1 loopback {**line** | **noloop** | **payload**}

Syntax Description

line	Sets the received signal to be looped at the line (does not penetrate the line).
noloop	Sets the interface to no loop.
payload	Sets the received signal to be looped through the device and returned.

Defaults

No loopback

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

This command is useful for testing the circuit emulation port adapter module.

Examples

The following example sets a payload loopback:

```
interface cbr 4/0
 ces dsx1 loopback payload
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
loopback	Configures the ATM interface into loopback mode.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces dsx1 signalmode robbedbit

To enable the signal mode as robbed bit on a constant bit rate (CBR) interface, use the **ces dsx1 signalmode robbedbit** interface configuration command. To return the signal mode to the default, use the **no** form of this command.

ces dsx1 signalmode robbedbit

no ces dsx1 signalmode robbedbit

Syntax Description

This command has no arguments or keywords.

Defaults

No signal mode is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

A T1 frame consists of 24 time slots (DS0) that send at a rate of 64 kbps. T1 defines the ability to send signalling in-band on individual time slots by removing the low bit of each byte for signalling in robbedbit mode. This procedure allows 8 kbps for signalling and leaves 56 kbps for data.

In structured mode, you can send the T1 signalling information across the network. Structured mode means that after you enable **robbedbit** signalling mode on the port, and enable CAS on individual circuits that need this type of service, you are robbing bits from the DS0. The system then puts the bits in the specified format to be sent across the network and reinserts them at the passive side on the CES-IWF connection.

Examples

The following example enables channel-associated signalling and robbed bit signalling:

```
interface cbr 4/0
 ces circuit 1 cas
 ces dsx1 signalmode robbedbit
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
ces circuit	Configures the connection attributes for the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.

Command	Description
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

ces partial-fill

To configure the number of user octets per cell for the ATM circuit emulation service (CES), use the **ces partial-fill** command in interface configuration mode. To delete the CES partial-fill value, use the **no** form of this command.

ces partial-fill *octets*

no ces partial-fill *octets*

Syntax Description

octets	Number of user octets per cell for the CES. Possible values of octet range from 0 to 47. Setting this number to zero disables partial cell fill and causes all cells to be completely filled before they are sent.

Defaults

47 octets

Command Modes

Interface configuration

Command History

Release	Modification
11.3 MA	This command was introduced.

Usage Guidelines

This command applies to ATM configuration on the Cisco MC3810.

Setting the value of the **ces partial-fill** command to zero disables partial cell fill and causes all cells to be completely filled before they are sent. This command is supported on serial ports 0 and 1 when the **encapsulation atm-ces** command is enabled.

Examples

The following example sets the CES partial cell fill to 20 octets per cell for serial port 0:

```
interface serial 0
 ces partial-fill 20
```

Related Commands

Command	Description
ces cell-loss-integration-period	Sets the CES cell-loss integration period on the Cisco MC3810 multiservice concentrator.
ces clockmode synchronous	Configures the ATM CES synchronous clock mode on the Cisco MC3810 multiservice concentrator.
ces connect	Maps the CES service to an ATM PVC on the Cisco MC3810 multiservice concentrator.
ces initial-delay	Configures the size of the receive buffer of a CES circuit on the Cisco MC3810 multiservice concentrator.

Command	Description
ces max-buf-size	Configures the send buffer of a CES circuit on the Cisco MC3810 multiservice concentrator.
ces service	Configures the ATM CES type on the Cisco MC3810 multiservice concentrator.

ces pvc

To configure the destination port for the circuit on the constant bit rate (CBR) interface, use the **ces pvc** interface configuration command. To remove the destination port on the circuit, use the **no** form of this command.

ces pvc *circuit-number* **interface atm** *slot/port* **vpi** *number* **vci** *number*

no ces pvc *circuit-number* **interface atm** *slot/port* **vpi** *number* **vci** *number*

Syntax Description

circuit-number	Selects the circuit identification. The range is 0 to 24. For unstructured service, use 0. For T1 structure service, the range is 1 through 24. For E1 structure service, the range is 1 through 31.
interface atm *slot/port*	Slot and port number of the ATM interface. Used to create a hard permanent virtual circuit (PVC). Only a hard PVC can be configured for the CBR interfaces on the ATM-CES port adapter.
vpi *number*	Virtual path identifier of the destination PVC. Range is 0 through 255.
vci *number*	Virtual channel identifier of the destination PVC. Range is 1 through 16383.

Defaults

No destination port is configured.

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Use the **interface** option to create a hard PVC. Use the **dest-atm-addr** option to create a soft PVC. Soft PVCs are not supported on Cisco 7200 series routers.

You must configure both sides of the CES circuits because at the source (the active side in CES-IWF), the time slots are not recognized at the destination (the passive side).

Each CES circuit has an ATM address. When configuring the source PVC, you need the destination ATM address.

Examples

The following example shows setting a hard PVC. In this example, the destination of ATM port 0 in slot 1 is assigned to circuit 31 on CBR port 0 in slot 1.

```
interface cbr 1/0
 ces pvc 31 interface atm 1/0 vpi 0 vci 512
```

Related Commands

Command	Description
ces aal1 service	Configures the type of CES used on the CBR interface.
show ces circuit	Displays detailed circuit information for the CBR interface.
show ces interface cbr	Displays detailed CBR port information.
show ces status	Displays the status of the ports on the ATM-CES port adapter.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

class-int

To assign a virtual circuit (VC) class to an ATM main interface or subinterface, use the **class-int** command in interface configuration mode. To remove a VC class, use the **no** form of this command.

class-int *vc-class-name*

no class-int *vc-class-name*

Syntax Description

vc-class-name	Name of the VC class you are assigning to your ATM main interface or subinterface.

Defaults

No VC class is assigned to an ATM main interface or subinterface.

Command Modes

Interface configuration

Command History

Release	Modification
11.3(4)T	This command was introduced, replacing the **class** command for assigning VC classes to ATM main interfaces or subinterfaces.

Usage Guidelines

Use this command to assign a previously defined set of parameters (defined in a VC class) to an ATM main interface or subinterface. To create a VC class that defines these parameters, use the **vc-class atm** command. Refer to the section "Configuring VC Classes" in the "Configuring ATM" chapter of the *Cisco IOS Wide-Area Networking Configuration Guide* for more information.

To use this command for assigning a VC class to an ATM main interface or subinterface, you must first enter the **interface atm** command to enter interface configuration mode.

When you create a VC class for an ATM main interface or subinterface, you can use the following commands to define your parameters: **abr**, **broadcast**, **bump**, **encapsulation**, **idle-timeout**, **ilmi manage**, **inarp**, **oam-bundle**, **oam-pvc**, **oam retry**, **oam-svc**, **protocol**, **ubr**, **ubr+**, and **vbr-nrt**.

Parameters applied to an individual VC supersede interface- and subinterface-level parameters. Parameters that are configured for a VC through discrete commands entered in interface-ATM-VC configuration mode supersede VC class parameters assigned to an ATM main interface or subinterface by the **class-int** command.

Examples

In the following example, a class called classA is first created and then applied to an ATM main interface 2/0:

```
! The following commands create the class classA:
vc-class atm classA
 ubr 10000
 encapsulation aal5mux ip

! The following commands apply classA to ATM main interface 2/0:
interface atm 2/0
 class-vc classA
```

Related Commands

Command	Description
abr	Selects ABR QoS and configures output peak cell rate and output minimum guaranteed cell rate for an ATM PVC or VC class.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
encapsulation aal5	Configures the AAL and encapsulation type for an ATM PVC, SVC, or VC class.
idle-timeout	Configures the idle timeout parameter for tearing down an ATM SVC connection.
ilmi manage	Enables ILMI management on an ATM PVC.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC bundle.
oam-pvc	Enables end-to-end F5 OAM loopback cell generation and OAM management for an ATM PVC or VC class.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
oam-svc	Enables end-to-end F5 OAM loopback cell generation and OAM management for an ATM SVC or VC class.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).
show atm map	Displays the list of all configured ATM static maps to remote hosts on an ATM network.
ubr	Configures UBR QoS and specifies the output peak cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
ubr+	Configures UBR QoS and specifies the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
vbr-nrt	Configures the VBR-NRT QoS and specifies output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, VC class, or VC bundle member.
vc-class atm	Configures a VC class for an ATM VC or interface.

class-vc

To assign a virtual circuit (VC) class to an ATM permanent virtual circuit (PVC), switched virtual circuit (SVC), or VC bundle member, use the **class-vc** command in the appropriate configuration mode. To remove a VC class, use the **no** form of this command.

class-vc *vc-class-name*

no class-vc *vc-class-name*

Syntax Description

vc-class-name	Name of the VC class you are assigning to your ATM PVC, SVC, or VC bundle member.

Defaults

No VC class is assigned to an ATM PVC, SVC, or VC bundle member.

Command Modes

Interface-ATM-VC configuration (for ATM PVCs and SVCs)

Bundle-vc configuration (for VC bundle members)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3(4)T	This command was introduced, replacing the **class** command for assigning VC classes to ATM PVCs and SVCs.
12.0(3)T	This command was modified to support application of a VC class to an ATM VC bundle and an ATM VC bundle member.
12.1(5)T	This command was made available in PVC-in-range configuration mode.

Usage Guidelines

Use this command to assign a previously defined set of parameters (defined in a VC class) to an ATM PVC, SVC, or VC bundle member. To create a VC class that defines these parameters, use the **vc-class atm** command. Refer to the section "Configuring VC Classes" in the "Configuring ATM" chapter of the *Cisco IOS Wide-Area Networking Configuration Guide* for more information.

ATM PVCs and SVCs

To use this command for assigning a VC class to an ATM PVC or SVC, you must first enter the **interface atm** command in global configuration mode and then the **pvc** or **svc** command in interface configuration mode.

When you create a VC class for an ATM PVC or SVC, you can use the following commands to define your parameters: **abr**, **broadcast**, **bump**, **encapsulation**, **idle-timeout**, **ilmi manage**, **inarp**, **oam-bundle**, **oam-pvc**, **oam retry**, **oam-svc**, **protocol**, **ubr**, **ubr+**, and **vbr-nrt**.

Parameters that are configured for a PVC or SVC through discrete commands entered in interface-ATM-VC configuration mode supersede VC class parameters assigned to an ATM PVC or SVC by the **class-vc** command.

ATM VC Bundle Members

To use this command for assigning a VC class to a VC bundle member, you must first enter the **pvc-bundle** command to enter bundle-vc configuration mode.

When you create a VC class for a VC bundle member, you can use the following commands to define your parameters: **bump**, **precedence**, **protect**, **ubr**, **ubr+**, and **vbr-nrt**. You cannot use the following commands in vc-class configuration mode to configure a VC bundle member: **encapsulation**, **protocol**, **inarp**, and **broadcast**. These commands are useful only at the bundle level, not the bundle member level.

Parameters applied to an individual VC supersede bundle-level parameters. Parameters that are directly configured for a VC through discrete commands entered in bundle-vc configuration mode supersede VC class parameters assigned to a VC bundle member by the **class-vc** command.

Examples

The following sections show examples for applying the **class-vc** command to ATM PVC, SVC, and VC bundle members.

In the following example, a class called classA is first created and then applied to an ATM PVC:

```
! The following commands create the class classA:
vc-class atm classA
 ubr 10000
 encapsulation aal5mux ip

! The following commands apply classA to an ATM PVC:
interface atm 2/0
 pvc router5 1/32
 class-vc classA
```

In the following example, a class called classA is first created and then applied to the bundle member called vcmember, a member of bundle1:

```
! The following commands create the class classA:
vc-class atm classA
 precedence 6-5
 no bump traffic
 protect group
 bump explicitly 7
 vbr-nrt 20000 10000 32

! The following commands create bundle1, add vcmember to bundle1, and then applies classA
! to vcmember:
bundle bundle1
 pvc-bundle vcmember
  class-vc classA
```

Taking into account hierarchy precedence rules, the VC bundle member vcmember will be characterized by these parameters:

- It carries traffic whose IP Precedence level is 6 and 5.
- It does not allow other traffic to be bumped onto it. When the VC goes down, its bumped traffic will be redirected to a VC whose IP Precedence level is 7.
- It is a member of the protected group of the bundle. When all members of a protected group go down, the bundle goes down.
- It has Variable Bit Rate-Non Real Time (VBR-NRT) quality of service traffic parameters.

Related Commands

Command	Description
abr	Selects ABR QoS and configures output peak cell rate and output minimum guaranteed cell rate for an ATM PVC or VC class.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
bump	Configures the bumping rules for a VC class that can be assigned to a VC bundle.
bundle	Creates a bundle or modifies an existing bundle to enter bundle configuration mode.
class-bundle	Configures a VC bundle with the bundle-level commands contained in the specified VC class.
encapsulation aal5	Configures the AAL and encapsulation type for an ATM PVC, SVC, or VC class.
idle-timeout	Configures the idle timeout parameter for tearing down an ATM SVC connection.
ilmi manage	Enables ILMI management on an ATM PVC.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC bundle.
oam-pvc	Enables end-to-end F5 OAM loopback cell generation and OAM management for an ATM PVC or VC class.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
oam-svc	Enables end-to-end F5 OAM loopback cell generation and OAM management for an ATM SVC or VC class.
precedence (VC bundle)	Configures precedence levels for a VC member of a bundle, or for a VC class that can be assigned to a VC bundle.
protect	Configures a VC class with protected group or protected VC status for application to a VC bundle member.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).
pvc-bundle	Adds a PVC to a bundle as a member of the bundle and enters bundle-vc configuration mode in order to configure that PVC bundle member.
show atm bundle	Displays the bundle attributes assigned to each bundle VC member and the current working status of the VC members.
show atm bundle statistics	Displays statistics on the specified bundle.
show atm map	Displays the list of all configured ATM static maps to remote hosts on an ATM network.
ubr	Configures UBR QoS and specifies the output peak cell rate for an ATM PVC, SVC, VC class, or VC bundle member.
ubr+	Configures UBR QoS and specifies the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, VC class, or VC bundle member.

Command	Description
vbr-nrt	Configures the VBR-NRT QoS and specifies output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, VC class, or VC bundle member.
vc-class atm	Configures a VC class for an ATM VC or interface.

clear atm arp

To clear Address Resolution Protocol (ARP) entries for an ATM interface that is configured as an ARP server, use the **clear atm arp** command in EXEC mode.

clear atm arp *atm-interface* {*ip-address* | *****}

Syntax Description

atm-interface	ATM interface number (for example, 3/0).
ip-address	Clears the ARP entry for the specified IP address.
*	Clears all ARP entries on the interface.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Use this command to clear ARP entries for an ATM interface. Use the asterisk (*) to delete all of the ARP entries for the interface, or specify the IP address of a particular entry to be deleted.

If an ARP entry for an existing virtual circuit (VC) is deleted, the ARP server will immediately try to get another entry for that VC.

Examples

The following example shows how to delete the ARP entry for 172.20.173.28:

```
Router# clear atm arp 3/0 172.20.173.28
```

dxi map

To map a protocol address to a given virtual path identifier (VPI) and virtual channel identifier (VCI), use the **dxi map** interface configuration command. To remove the mapping for that protocol and protocol address, use the **no** form of this command.

dxi map *protocol protocol-address vpi vci* [**broadcast**]

no dxi map *protocol protocol-address*

Syntax Description

protocol	One of the following bridging or protocol keywords: **apollo**, **appletalk**, **bridge**, **clns**, **decnet**, **ip**, **novell**, **vines**, or **xns**.
protocol-address	Protocol-specific address.
vpi	Virtual path identifier in the range 0 to 15.
vci	Virtual circuit identifier in the range 0 to 63.
broadcast	(Optional) Address to which broadcasts should be forwarded.

Defaults

No map definition is established.

Command Modes

Interface configuration

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

This command is used in configurations where the router is intended to communicate with an ATM network through an ATM data service unit (ADSU). Given the circuit identifier parameters (VPI and VCI) for the ATM permanent virtual circuit (PVC), the router computes and uses the DXI frame address (DFA) that is used for communication between the router and the ADSU.

The **dxi map** command can be used only on a serial interface or HSSI configured for ATM-DXI encapsulation.

Examples

The following example converts all IP packets intended for the host with IP address 172.21.170.49 into ATM cells identified with a VPI of 2 (binary 0000 0010) and a VCI of 46 (binary 0000 0000 0010 1110) by the ADSU:

```
interface serial 0
 dxi map ip 172.21.170.49 2 46 broadcast
```

Using the mapping defined in Annex A of the ATM DXI Specification, the router uses the VPI and VCI information in this example to compute a DFA of 558 (binary 1000101110). The ADSU will use the DFA of the incoming frame to extract the VPI and VCI information when formulating ATM cells.

Related Commands

Command	Description
dxi pvc	Configures multiprotocol or single protocol ATM-DXI encapsulation.
encapsulation atm-dxi	Enables ATM-DXI encapsulation.

dxi pvc

To configure multiprotocol or single protocol ATM-Data Exchange Interface (DXI) encapsulation, use the **dxi pvc** interface configuration command. To disable multiprotocol ATM-DXI encapsulation, use the **no** form of this command.

dxi pvc *vpi vci* [**snap** | **nlpid** | **mux**]

no dxi pvc *vpi vci* [**snap** | **nlpid** | **mux**]

Syntax Description

vpi	ATM network virtual path identifier (VPI) of this PVC, in the range from 0 through 15. The VPI is a 4-bit field in the header of the ATM DXI frame. The VPI value is unique only on a single interface, not throughout the ATM network, because it has local significance only. Both *vpi* and *vci* cannot be specified as 0; if one is 0, the other cannot be 0.
vci	ATM network virtual channel identifier (VCI) of this PVC, in the range from 0 to 63. The VCI is a 6-bit field in the header of the ATM DXI frame. The VCI value is unique only on a single interface, not throughout the ATM network, because it has local significance only. Both vpi and vci cannot be specified as 0; if one is 0, the other cannot be 0
snap	(Optional) LLC/SNAP encapsulation based on the protocol used in the packet. This keyword defines a PVC that can carry multiple network protocols. This is the default.
nlpid	(Optional) RFC 1294/1490 encapsulation. This option is provided for backward compatibility with the default encapsulation in earlier versions of the Cisco IOS software.
mux	(Optional) MUX encapsulation; the carried protocol is defined by the **dxi map** command when the PVC is set up. This keyword defines a PVC that carries only one network protocol.

Defaults

LLC/SNAP encapsulation

Command Modes

Interface configuration

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

This command can be used only on a serial interface or HSSI that is configured with ATM-DXI encapsulation.

Select the **nlpid** option if you are using the default encapsulation for software releases earlier than Cisco IOS Release 10.3.

Examples

The following example configures ATM-DXI MUX encapsulation on serial interface 1. The PVC identified by a VPI of 10 and a VCI of 10 can carry a single protocol. Then the protocol to be carried on this PVC is defined by the **dxi map** command.

```
interface serial 1
 dxi pvc 10 10 mux
 dxi map ip 172.21.176.45 10 10 broadcast
```

The following example configures ATM-DXI NLPID encapsulation on serial interface 1. The PVC identified by a VPI of 11 and a VCI of 12 can carry multiprotocol traffic that is encapsulated with a header described in RFC 1294/1490.

```
interface serial 1
 dxi pvc 11 12 nlpid
```

Related Commands

Command	Description
class-int	Maps a protocol address to a given VPI and VCI.
encapsulation atm-dxi	Enables ATM-DXI encapsulation.
show dxi pvc	Displays the PVC statistics for a serial interface.

encapsulation aal5

To configure the ATM adaptation layer (AAL) and encapsulation type for an ATM permanent virtual circuit (PVC), switched virtual circuit (SVC), virtual circuit (VC) class, or VC bundle, use the **encapsulation aal5** command in the appropriate command mode. To remove an encapsulation from a PVC, SVC, VC class, or VC bundle, use the **no** form of this command.

encapsulation aal5*encap* [**virtual-template** *number*]

no encapsulation aal5*encap* [**virtual-template** *number*]

Note To configure Integrated Local Management Interface (ILMI), QSAAL, or Switched Multimegabit Data Service (SMDS) encapsulations for an ATM PVC, use the **pvc** command.

Syntax Description

encap	AAL and encapsulation type. When **mux** is specified, a protocol is required. Possible options for the *encap* argument are as follows: **auto**—For PPP over ATM SVCs only. The **auto** keyword enables an ATM SVC to use either aal5snap or aal5mux encapsulation. **ciscoppp**—For Cisco Point-to-Point Protocol (PPP) over ATM. Supported on ATM PVCs only. **mux apollo**—For a multiplex (MUX)-type VC using the Apollo protocol. **mux appletalk**—For a MUX-type VC using the AppleTalk protocol. **mux decnet**—For a MUX-type VC using the DECnet protocol. **mux frame-relay**—For a MUX-type virtual circuit for Frame Relay-ATM Network Interworking (FRF.5) on the Cisco MC3810. **mux fr-atm-srv**—For a MUX-type virtual circuit for Frame Relay-ATM Service Interworking (FRF.8) on the Cisco MC3810. **mux ip**—For a MUX-type VC using the IP protocol. **mux ipx**—For a MUX-type VC using the IPX protocol. **mux ppp**—For a MUX-type virtual circuit running IETF-compliant PPP over ATM. You must use the **virtual-template** *number* argument to identify the virtual template. (If you need to establish a virtual template, use the **interface virtual-template** command.) The **mux ppp** keyword applies to ATM PVCs only.

Syntax Description

	mux vines—For a MUX-type VC using the VINES protocol. **mux voice**—For a MUX-type VC for Voice over ATM on the Cisco MC3810 router. **mux xns**—For a MUX-type VC using the XNS protocol. **nlpid**—Allows ATM interfaces to interoperate with High-Speed Serial Interfaces (HSSIs) that are using an ATM data service unit (ADSU) and running ATM-Data Exchange Interface (DXI). Supported on ATM PVCs only. **snap**—The only encapsulation supported for Inverse ARP. Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram.
virtual-template *number*	(Optional) (This argument is required for **ciscoppp** encapsulation only.) Specifies the number used to identify the virtual template.

Defaults

The global default encapsulation is **snap**. See the "Usage Guidelines" section for other default characteristics.

Command Modes

Interface-ATM-VC configuration (for an ATM PVC or SVC)

VC-class configuration (for a VC class)

Bundle configuration (for a VC bundle)

PVC range configuration (for an ATM PVC range)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3 T	This command was introduced.
12.0(3)T	• This command was enhanced to provide encapsulation configuration for ATM VC bundles. • The **mux frame** and **mux voice** options were added for the Cisco MC3810 series router.
12.0(7)T	• The **mux fr-atm-srv** option was added for the Cisco MC3810 series router. • The **mux frame** option was changed to **mux frame-relay**.
12.1(3)T	The **auto** option was added to provide encapsulation configuration for PPP over ATM SVCs.
12.1(5)T	The **ciscoppp**, **mux**, and **snap** options were made available in PVC range and PVC-in-range configuration modes.

Usage Guidelines

A VC bundle can have only one encapsulation configured for it: either **snap** or **mux.**

Use one of the **mux** encapsulation options to dedicate the specified PVC to a single protocol; use the **snap** encapsulation option to multiplex two or more protocols over the same PVC. Whether you select **mux** or **snap** encapsulation might depend on practical considerations, such as the type of network and the pricing offered by the network. If the pricing of the network depends on the number of PVCs set up, **snap** might be the appropriate choice. If pricing depends on the number of bytes transmitted, **mux** might be the appropriate choice because it has slightly less overhead.

To use this command to configure a VC bundle, first enter the **bundle** subinterface configuration command to create a new bundle or modify an existing one and to enter bundle configuration mode.

Note When a VC is a member of a VC bundle, configuration using the **encapsulation aal5** command in VC class mode no longer applies to the VC. Bundle configuration takes precedence.

When configuring Cisco PPP over ATM, specify the **ciscoppp** encapsulation for the *encap* argument and specify the virtual template number.

It is possible to implicitly create a virtual template when configuring Cisco PPP over ATM. In other words, if the parameters of the virtual template are not explicitly defined before you configure the ATM PVC, the PPP interface will be brought up using default values from the virtual template identified. However, some parameters (such as an IP address) take effect only if they are specified before the PPP interface comes up. Therefore, we recommend that you explicitly create and configure the virtual template before configuring the ATM PVC to ensure such parameters take effect.

If you specify virtual template parameters after the ATM PVC is configured, you should enter a **shutdown** command followed by a **no shutdown** command on the ATM subinterface to restart the interface, causing the newly configured parameters (such as an IP address) to take effect.

If the **encapsulation aal5** command is not explicitly configured on an ATM PVC, SVC, or VC bundle, the VC inherits the following default configuration (listed in order of precedence from lowest to highest):

- Configuration of the **encapsulation aal5** command in a VC class assigned to the PVC, PVC bundle, or SVC itself
- Configuration of the **encapsulation aal5** command in a VC class assigned to the PVC's, SVC's, or VC bundle's ATM subinterface
- Configuration of the **encapsulation aal5** command in a VC class assigned to the PVC's, SVC's, or VC bundle's ATM main interface
- Global default: *encap* = **snap**

When configuring a PVC range or an individual PVC within a PVC range, the following options are available:

- **encapsulation aal5ciscoppp**
- **encapsulation aal5mux**
- **encapsulation aal5snap**

Examples

The following example configures an ATM SVC called "chicago" with encapsulation auto. Encapsulation auto enables the SVC to use PPP and either aal5snap or aal5mux encapsulation.

```
svc chicago
  encapsulation aal5auto
```

The following example configures an ATM PVC with VPI 0 and VCI 33 for a MUX-type encapsulation using IP:

```
pvc 0/33
 encapsulation aal5mux ip
```

The following example configures a bundle called chicago for aal5snap encapsulation:

```
bundle chicago
 encapsulation aal5snap
```

Related Commands

Command	Description
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
class-int	Assigns a VC class to an ATM main interface or subinterface.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC bundle.
oam-bundle	Enables end-to-end F5 OAM loopback cell generation and OAM management for a virtual circuit class that can be applied to a virtual circuit bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).

encapsulation atm-dxi

To enable ATM-Data Exchange Interface (DXI) encapsulation, use the **encapsulation atm-dxi** interface configuration command. To disable ATM-DXI, use the **no** form of this command.

encapsulation atm-dxi

no encapsulation atm-dxi

Syntax Description

This command has no arguments or keywords.

Defaults

When ATM-DXI encapsulation is not configured, HDLC is the default encapsulation.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Examples

The following example configures ATM-DXI encapsulation on serial interface 1:

```
interface serial 1
 encapsulation atm-dxi
```

Related Commands

Command	Description
class-int	Maps a protocol address to a given VPI and VCI.

idle-timeout

To configure the idle timeout parameter for tearing down an ATM switched virtual circuit (SVC) connection, use the **idle-timeout** command in the appropriate command mode. To disable the timeout parameter, use the **no** form of this command.

idle-timeout *seconds* [*minimum-rate*]

no idle-timeout *seconds* [*minimum-rate*]

Syntax Description

seconds	Number of seconds that the SVC is idle, after which the ATM SVC is disconnected.
minimum-rate	(Optional) Minimum traffic rate, in kilobits per second (kbps), required on an ATM SVC to maintain the SVC connection.

Defaults

The default idle timeout is 300 seconds.

The default *minimum-rate* is 0 kbps.

Command Modes

Interface-ATM-VC configuration (for ATM permanent virtual circuits [PVCs] or SVCs)

VC-class configuration (for virtual circuit [VC] classes)

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

If within the idle timeout period, both the input and output traffic rates are below the *minimum-rate*, the SVC connection is torn down. The input and output traffic rates are set using the **ubr**, **ubr+**, or **vbr-nrt** command.

If the **idle-timeout** command is not explicitly configured on an ATM SVC, the SVC inherits the following default configuration (listed in order of next highest precedence):

- Configuration of the **idle-timeout** command in a VC class assigned to the SVC itself.
- Configuration of the **idle-timeout** command in a VC class assigned to the SVC's ATM subinterface.
- Configuration of the **idle-timeout** command in a VC class assigned to the SVC's ATM main interface.
- Global default—The global idle timeout default is the value set using the **idle-timeout** interface configuration command. If the **idle-timeout** command is not configured, the default idle timeout is 300 seconds, and the *minimum-rate* is 0 kbps.

Examples

The following example configures an ATM SVC connection inactive after an idle period of 300 seconds. The SVC connection is also configured so that it is considered inactive if the traffic rate is less than 5 kbps.

```
idle-timeout 300 5
```

Related Commands

Command	Description
ubr	Selects UBR QoS and configures the output peak cell rate for an ATM PVC, SVC, or VC class.
ubr+	Selects UBR QoS and configures the output peak cell rate and output minimum guaranteed cell rate for an ATM PVC, SVC, or VC class.
vbr-nrt	Configures the VBR-NRT QoS and specifies output peak cell rate, output sustainable cell rate, and output maximum burst cell size for an ATM PVC, SVC, or VC class.

ilmi manage

To enable Integrated Local Management Interface (ILMI) management on an ATM permanent virtual circuit (PVC), use the **ilmi manage** command in the appropriate command mode. To disable ILMI management, use the **no** form of this command.

ilmi manage

no ilmi manage

Syntax Description

This command has no arguments or keywords.

Defaults

ILMI management is disabled.

Command Modes

Interface-ATM-VC configuration (for an ATM PVC)

VC-class configuration (for a virtual circuit [VC] class)

PVC range configuration (for an ATM PVC range)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3 T	This command was introduced.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.

Usage Guidelines

If the **ilmi manage** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of precedence):

- Configuration of the **ilmi manage** command in a VC class assigned to the PVC itself.
- Configuration of the **ilmi manage** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **ilmi manage** command in a VC class assigned to the PVC's ATM main interface.
- Global default: ILMI management is disabled.

Examples

The following example enables ILMI management on the ATM PVC with VPI 0 and VCI 60. The ILMI PVC is assigned the name routerA and the VPI and VCI are 0 and 16, respectively.

```
interface atm 0/0
 pvc routerA 0/16 ilmi
 exit
interface atm 0/0.1 multipoint
 pvc 0/60
 ilmi manage
```

ima active-links-minimum

To set the minimum number of links that must be operating in order for an ATM inverse multiplexing over ATM (IMA) group to remain in service, use the **ima active-links-minimum** interface configuration command. To remove the current configuration and set the value to the default, use the **no** form of this command.

ima active-links-minimum *number*

no ima active-links-minimum *number*

Syntax Description

number	Number of links; a value from 1 to 8.

Defaults

The default is one link.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

The minimum number of links that should be active for continued group operation depends upon the applications you are using and the speeds they require. ATM frame size and the number of links in a group affect the overhead required by ATM.

Examples

The following example specifies that two links in IMA group 2 must be operational in order for the group to remain in service:

```
interface atm 0/ima2
 ima active-links-minimum 2
```

Related Commands

Command	Description
interface atm ima	Configures an ATM IMA group.

ima clock-mode

To set the transmit clock mode for an ATM inverse multiplexing over ATM (IMA) group, use the **ima clock-mode** interface configuration command. To remove the current configuration, use the **no** form of this command.

ima clock-mode {**common** *port* | **independent**}

no ima clock-mode

Syntax Description

common	The transmit clocks for all the links in the group are derived from the same source.
port	When you choose a common clock source, also specify the link that will provide clocking for the IMA group, which is called the common link. If the common link fails, the system automatically chooses one of the remaining active links to provide clocking.
independent	The transmit clock source for at least one link in the IMA group is different from the clock source used by the other links.

Defaults

The default value is **common**. If no port is specified, the system automatically chooses an active link to provide clocking.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

This command controls the clock for the IMA group as a whole. If all the links in the group share a clock source, use the **common** keyword. If all the links use different clock sources, use the **independent** clock source keyword.

When the **common** keyword is set, the **clock source** ATM interface configuration command for the common link determines clocking for all the links in the group.When the **independent** keyword is set, the **clock source** ATM interface configuration command is used under each interface to determine clocking individually.

Because the system automatically chooses a replacement for the common link when it fails, any link in an IMA group potentially can provide the recovered transmit clock. For this reason, even when the common keyword is set with a specific link stipulated by the port value, you should use the ATM interface configuration **clock source** command to make sure that the clock source is configured correctly on each interface in the IMA group.

Examples

The following example specifies that the links in IMA group 2 use a common clock source on link 0:

```
interface atm0/ima2
 ima clock-mode common 0
```

Related Commands

Command	Description
clock source	Configures the clock source of a DS1 link.
interface atm ima	Configures an ATM IMA group.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

ima differential-delay-maximum

To specify the maximum differential delay among the active links in an inverse multiplexing over ATM (IMA) group, use the **ima differential-delay-maximum** interface configuration command. To restore the default setting, use the **no** form of this command.

ima differential-delay-maximum *msec*

no ima differential-delay-maximum *msec*

Syntax Description

msec	Specifies the differential delay in milliseconds (ms). The range of values depends on the type of card used. PA-A3-8T1IMA—25 to 250 milliseconds PA-A3-8E1IMA—25 to 190 milliseconds NM-8T1-IMA—25 to 200 milliseconds

Defaults

25 milliseconds

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

This command helps control latency in ATM-layer traffic by setting a limit on how much latency the slowest link in the group is allowed to introduce (a slower link has a longer propagation delay—for example, due to a longer path through the network or less accurate physical layer clocking—than other links). Setting a high value allows a slow link to continue operating as part of the group, although such a setting means there is added delay to links across the group. A low setting may result in less latency for traffic across the group than a high setting, but it can mean that the system takes a slow link out of operation, reducing total bandwidth.

When a link has been removed from service, it is automatically placed back in service when it meets the delay differential standard. If a link delay exceeds the specified maximum, the link is dropped; otherwise, the IMA feature adjusts for differences in delays so that all links in a group are aligned and carry ATM-layer traffic.

Examples

The following example specifies that the links in IMA group 2 have a maximum differential delay of 50 ms:

```
interface atm0/ima2
 ima differential-delay-maximum 50
```

Related Commands

Command	Description
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

ima frame-length

To specify the number of cells in IMA frames, use the **ima frame-length** interface configuration command. IMA frames are numbered sequentially and each contains an IMA Control Protocol (ICP) cell at a specific position. To remove the current setting and restore the default value, use the **no** form of this command.

ima frame-length {**32** | **64** | **128** | **256**}

no ima frame-length {**32** | **64** | **128** | **256**}

Syntax Description

32	Specifies a value of 32 cells.
64	Specifies a value of 64 cells.
128	Specifies a value of 128 cells.
256	Specifies a value of 256 cells.

Defaults

The default value is 128 cells in a frame.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.0(7)XE1	Support for Cisco 7100 series routers added.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

Frame length can affect performance, because the greater the total number of frames required to communicate a given number of cells, the greater the overhead for header and other control cells. In addition, shorter frame lengths might diminish performance when translated ATM-Frame Relay interworking occurs.

Examples

On Cisco 7100 and 7200 series routers, the following example specifies that the links in IMA group 2 have a frame length of 64 cells:

```
interface atm 1/ima2
 ima frame-length 64
```

ima-group

To define physical links as inverse multiplexing over ATM (IMA) group members, use the **ima-group** interface configuration command for each group member. To remove the port from the group, use the **no** form of this command.

ima-group *group-number*

no ima-group *group-number*

Syntax Description

group-number	Specifies an IMA group number from 0 to 3. IMA groups can span multiple ports on a port adapter but cannot span port adapters.

Defaults

Physical links are not included in IMA groups.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

When the configuration is first performed or when the group number is changed, the interface is automatically disabled, moved to the new group, and then enabled.

Examples

The following example makes interface 1 on the ATM module in slot 0 a member of IMA group 2:

```
interface atm0/1
 ima-group 2
```

Related Commands

Command	Description
interface atm	Configures an ATM interface.
interface atm ima	Configures an ATM IMA group.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.
shutdown (interface)	Disables an interface.

ima test

To specify an interface and test pattern for verifying connectivity of all links in an IMA group, use the **ima test** interface configuration command. To stop the test, use the **no** form of this command.

ima test [**link** *port*] [**pattern** *pattern-id*]

no ima test [**link** *port*] [**pattern** *pattern-id*]

Syntax Description

link *port*	(Optional) The identifier for the interface wherethe physical link is located.
pattern *pattern-id*	(Optional) A value from 0 to 254, set in hexadecimal or decimal numbers, identifying a pattern to be sent to the far end of the link.

Defaults

There is no default for the *port* value. The default value for *pattern-id* is 106 (0x6A).

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

To verify link and group connectivity, the pattern is sent from the specified link and looped back from the receiving end across all links belonging to the group as defined at the remote end. Verifying link and group connectivity can help troubleshoot physical link connectivity or configuration problems at the remote end. The local end verifies that the pattern is returned on all links belonging to the group at the local end, and testing is continuous. An IMA control protocol (ICP) cell in each frame identifies the pattern.

When a link is not transmitting or receiving a pattern correctly, the command reports the link number where the problem exists.

Examples

The following example configures link 4 to send test pattern 56:

```
interface atm 0/ima 2
 ima test link 2 pattern 56
```

Related Commands

Command	Description
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.

inarp

To configure the Inverse Address Resolution Protocol (ARP) time period for an ATM permanent virtual circuit (PVC), virtual circuit (VC) class, or VC bundle, use the **inarp** command in the appropriate command mode. To restore the default Inverse ARP time period behavior, use the **no** form of this command.

inarp *minutes*

no inarp *minutes*

Syntax Description

minutes	Number of minutes for the Inverse ARP time period.

Defaults

When Inverse ARP is enabled, *minutes* = 15 minutes.

Command Modes

Interface-ATM-VC configuration (for an ATM PVC)

VC-class configuration (for a VC class)

Bundle configuration (for a VC bundle)

PVC range configuration (for an ATM PVC range)

PVC-in-range configuration (for an individual PVC within a PVC range)

Command History

Release	Modification
11.3 T	This command was introduced.
12.0(3)T	This command was enhanced to provide support to configure the Inverse ARP time period for an ATM VC bundle.
12.1(5)T	This command was made available in PVC range and PVC-in-range configuration modes.

Usage Guidelines

This command is supported for **aal5snap** encapsulation only when Inverse ARP is enabled. Refer to the **encapsulation** command for configuring **aal5snap** encapsulation and the **protocol** command for enabling Inverse ARP.

If the **inarp** command is not explicitly configured on an ATM PVC, the PVC inherits the following default configuration (listed in order of precedence):

- Configuration of the **inarp** command in a VC class assigned to the PVC itself.
- Configuration of the **inarp** command in a VC class assigned to the PVC's ATM subinterface.
- Configuration of the **inarp** command in a VC class assigned to the PVC's ATM main interface.
- Global default for the *minutes* argument is 15 minutes; this default assumes that Inverse ARP is enabled.

Note As the inheritance rules imply, when a VC is a member of a VC bundle, configuration using the **inarp** command in VC class configuration mode no longer applies to that VC. Bundle configuration takes precedence.

For ATM VC bundle management, the Inverse ARP parameter can only be enabled at the bundle level and applied to all VC members of the bundle—that is, it cannot be enabled in bundle-vc configuration mode for individual VC bundle members. To use this command in bundle configuration mode, first enter the **bundle** command to create the bundle and enter bundle configuration mode.

Examples

The following example sets the Inverse ARP time period to 10 minutes:

```
inarp 10
```

Related Commands

Command	Description
bundle	Creates a bundle or modifies an existing bundle to enter bundle configuration mode.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
class-int	Assigns a VC class to an ATM main interface or subinterface.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
encapsulation aal5	Configures the AAL and encapsulation type for an ATM PVC, SVC, or VC class.
oam-bundle	Enables end-to-end F5 OAM loopback cell generation and OAM management for a virtual circuit class that can be applied to a virtual circuit bundle.
oam retry	Configures parameters related to OAM management for an ATM PVC, SVC, VC class, or VC bundle.
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle. Enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC by either configuring Inverse ARP directly on the PVC, on the VC bundle, or in a VC class (applies to IP and IPX protocols only).

interface atm

To configure an ATM interface type and enter interface configuration mode, use the **interface atm** global configuration command.

Cisco 7500 series with AIP; Cisco 7200 series with ATM, ATM-CES, and enhanced ATM port adapters; Cisco 2600 and 3600 series with 1-port ATM-25 network module

interface atm *slot*/**0**

Cisco 7500 series with ATM and enhanced ATM port adapter

interface atm *slot*/*port-adapter*/**0**

Cisco 4500 and 4700 series with NPM

interface atm *number*

Cisco 2600 and 3600 series

interface atm *slot*/*port*

To configure an ATM subinterface, use the **interface atm** global configuration command.

Cisco 7500 series with AIP; Cisco 7200 series with ATM, ATM-CES, and enhanced ATM port adapters; Cisco 2600 and 3600 series with 1-port ATM-25 network module

interface atm *slot*/**0.** *subinterface-number* {**multipoint** | **point-to-point**}

Cisco 7500 series with ATM and enhanced ATM port adapter

interface atm *slot*/*port-adapter*/**0.***subinterface-number* {**multipoint** | **point-to-point**}

Cisco 4500 and 4700 series with NPM

interface atm *number*.*subinterface-number* {**multipoint** | **point-to-point**}

Cisco 2600 and 3600 series

interface atm *slot*/*port*.*subinterface-number* {**multipoint** | **point-to-point**}

Syntax Description

slot	Specifies the backplane slot number on your router. The value ranges from 0 to 4, depending on what router you are configuring. Refer to your router hardware documentation.
/0	ATM port number. Because the ATM Interface Processor (AIP) and all ATM port adapters have a single ATM interface, the port number is always 0.
port-adapter	ATM port adapter number for the ATM port adapter or enhanced ATM port adapter on Cisco 7500 series routers. The value can be 0 or 1.

number	On Cisco 4500 and Cisco 4700 routers, specifies the network processing module (NPM) number. The numbers are assigned at the factory at the time of installation or when added to a system, and can be displayed with the **show interfaces** command.
port	ATM port number on a Cisco 2600 or 3600 series router, indicating the T1 or E1 link that you are configuring. Enter a value from 0 to 3 or from 0 to 7, depending on whether the network module has four ports or eight ports.
.*subinterface-number*	Subinterface number in the range 1 to 4294967293.
multipoint | **point-to-point**	Specifies a multipoint or point-to-point subinterface.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.

Examples

The following example assigns an IP network address and network mask to the ATM interface in slot 1 on port 0 of a Cisco 7500 series router:

```
interface atm 1/0
 ip address 10.1.1.1.255.255.255.0
```

Related Commands

Command	Description
show interfaces atm	Displays information about the ATM interface.

interface atm ima

To configure an inverse multiplexing over ATM (IMA) group, use the **interface atm ima** global configuration command.

interface atm *slot*/**ima***group-number*

Syntax Description

slot/	Specifies the slot location of the ATM IMA network module. The values range from 0 to 5 depending on the router.
group-number	Enter an IMA group number from 0 to 3. You can create up to four groups. Do not include a space before the group number.

Defaults

By default there are no IMA groups, only individual ATM links.

Command Modes

Global configuration

Command History

Release	Modification
12.0(5)XK	This command was introduced on Cisco 2600 and 3600 series routers.
12.0(5)T	This command was integrated into Cisco IOS 12.0(5)T.
12.0(5)XE	Support for Cisco 7200 and 7500 series routers was added.
12.0(7)XE1	Support for Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

If the group does not exist when the command is issued, the command automatically creates the group.

When a port is configured for IMA functionality, it no longer operates as an individual ATM link.

Specifying ATM links as members of a group by using the **ima group** interface command does not enable the group. You must use the **interface atm ima** command to create the group.

Examples

The following example configures IMA group 0 on the module in slot 1:

```
interface atm 1/ima0
  ip address 10.18.16.121 255.255.255.192
```

Related Commands

Command	Description
ima-group	Defines IMA group members.
interface atm	Configures an ATM interface.
show ima interface atm	Provides information about all configured IMA groups or a specific IMA group.
shutdown (interface)	Disables an interface.

interface cbr

To specify the T1 or E1 constant bit rate interface on an ATM-CES port adapter, and to enter interface configuration mode, use the **interface cbr** global configuration command.

interface cbr *slot/port*

Syntax Description

slot/	Backplane slot number.
port	Interface port number.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

The ATM-CES port adapter has four T1 (1.544 Mbps) or four E1 (2.048 Mbps) ports (75- or 120-ohm) that can support both structured (N x 64 kbps) and unstructured ATM Forum-compliant circuit emulation services (CES), and one port that supports an OC-3 (155 Mbps) single-mode intermediate reach interface or a T3 (45 Mbps) or E3 (34 Mbps) standards-based ATM interface.

Examples

The following example specifies the first T1 or E1 port on the ATM-CES port adapter in slot 1:

```
interface cbr 1/0
```

Related Commands

Command	Description
show ces interface cbr	Displays detailed CBR port information.
show interface cbr	Displays the information about the CBR interface on the ATM-CES port adapter.

loopback

To loop packets back to the interface for testing, use the **loopback** interface configuration command with or without an optional keyword. To remove the loopback, use the **no** form of this command.

Cisco 2600 and 3600 Series

loopback [**line** | **local** | **payload** | **remote**]

no loopback [**line** | **local** | **payload** | **remote**]

Cisco 7100, 7200, and 7500 Series

loopback {**diagnostic** | **local** {**payload** | **line**} | **remote** {**iboc** | **esf** {**payload** | **line**}}}
(for T1 lines)

loopback {**diagnostic** | **local** {**payload** | **line**}}
(for E1 lines)

no loopback

Syntax Description

line	Places the interface into external loopback mode at the line.
local	Places the interface into local loopback mode.
payload	Places the interface into external loopback mode at the payload level.
remote	Keeps the local end of the connection in remote loopback mode.
diagnostic	Loops the outgoing transmit signal back to the receive signal.
iboc	Sends an in-band code to the far-end receiver to cause it to go into line loopback.
esf	Specifies the FDL loopbacks. FDL should be configured on the link.

Defaults

The **line** keyword is the default.

Loopback is disabled by default.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
11.3 MA	This command was modified for the Cisco MC3810.
12.0(5)XK	Support for the Cisco 2600 and 3600 series routers was added.
12.0(5)T	Support for the Cisco 2600 and 3600 series routers was integrated into Cisco IOS Release 12.0(5)T.
12.0(5)XE	Support for the Cisco 720 0 and 7500 series routers was added.

Release	Modification
12.0(7)XE1	Support for the Cisco 7100 series routers was added.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

You can use a loopback test on lines to detect and distinguish equipment malfunctions caused either by line and channel service unit/digital service unit (CSU/DSU) or by the interface. If correct data transmission is not possible when an interface is in loopback mode, the interface is the source of the problem.

The local loopback does not generate any packets automatically. Instead, the **ping** command is used.

Examples

The following example sets up local loopback diagnostics:

```
interface atm 1/0
 loopback local
```

loopback (ATM)

To configure the ATM interface into loopback mode, use the **loopback** interface configuration command. To remove the loopback, use the **no** form of this command.

loopback [**cell** | **line** | **payload**]

no loopback [**cell** | **line** | **payload**]

Syntax Description

cell	(Optional) Places the interface into external loopback at cell level.
line	(Optional) Places the interface into external loopback at the line.
payload	(Optional) Places the interface into external loopback at the payload level.

Defaults

line

Command Modes

Interface configuration

Command History

Release	Modification
11.0	This command was introduced.
11.1	The following keywords were removed: • **diagnostic** • **test**

Usage Guidelines

This command is useful for testing because it loops all packets from the ATM interface back to the interface as well as directing the packets to the network.

Use the **loopback line** command to check that the PA-A3 port adapter is working by looping the receive data back to the transmit data.

Examples

The following example loops all packets back to the ATM interface:

```
interface atm 4/0
 loopback
```

Related Commands

Command	Description
ces dsx1 loopback	Enables a loopback for the CBR interface.

map-class atm

This command is no longer supported.

mid

To set the range of message identifier (MID) values on a permanent virtual circuit (PVC), use the **mid** interface-ATM-VC configuration command. To remove MID value range settings, use the **no** form of this command.

mid *midlow midhigh*

no mid *midlow midhigh*

Syntax Description

midlow	Starting MID number for this PVC. This can be set between 0 and 1023.
midhigh	Ending MID number for this PVC. This can be set between 0 and 1023.

Defaults

0

Command Modes

Interface-ATM-VC configuration

Command History

Release	Modification
11.3(2)T	This command was introduced.

Usage Guidelines

This command is only available when SMDS encapsulation is configured on a PVC.

Use this command to assign different ranges of message identifiers to different PVCs.

Examples

In the following example, the **atm mid-per-vc** command limits the maximum number of message identifiers to 32 for each VC on the ATM interface. Using the **mid** command, the selected range of numbers that are available for the message identifiers on PVC 1/40 is 0 to 31. For PVC 2/50, the range is 32 to 63.

```
interface atm 2/0
 atm mid-per-vc 32
 pvc 1/40 smds
 mid 0 31
 pvc 2/50 smds
 mid 32 63
```

network-clock-select (ATM)

To establish the sources and priorities of the requisite clocking signals for an ATM-CES port adapter, use the **network-clock-select** global configuration command. To remove the clock source, use the **no** form of this command.

network-clock-select *priority* {**cbr** | **atm**} *slot*/*port*

no network-clock-select *priority* {**cbr** | **atm**} *slot*/*port*

Syntax Description

priority	Priority of the clock source. Values are 1 (high priority) to 4 (low priority).
cbr	Specifies a CBR interface to supply the clock source.
atm	Specifies an ATM interface to supply the clock source.
slot/	Backplane slot number.
port	Interface port number.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

To support synchronous or synchronous residual time stamp (SRTS) clocking modes on the CBR interface, you must specify a primary reference source to synchronize the flow of CBR data from its source to its destination.

You can specify up to four clock priorities. The highest priority active interface in the router supplies primary reference source to all other interfaces that require network clock synchronization services. The fifth priority is the local oscillator on the ATM-CES port adapter.

Use the **show network-clocks** command to display currently configured clock priorities on the router.

Examples

The following example defines two clock priorities on the router:

```
network-clock-select 1 cbr 2/0
network-clock-select 2 atm 2/0
```

Related Commands

Command	Description
ces aal1 clock	Configures the AAL1 timing recovery clock for the CBR interface.
ces dsx1 clock source	Configures a transmit clock source for the CBR interface.
show network-clocks	Displays which ports are designated as network clock sources.