

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 “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

Broadcast transmission is not enabled.
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 “bundle1”:

```
bundle bundle1
 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 or the PA-A3 port adapter for the Cisco 7200 and 7500 series routers, 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

<i>rate</i>	Constant bit rate (also known as the average cell rate) for ATM CES. The valid range for this command is from 56 to 10000 kbps for ATM CES on the Cisco MC3810 or from 1 to 155000 kbps for the PA-A3 port adapter on the Cisco 7200 and 7500 series routers.
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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.
12.2(5)	Support was added for the PA-A3 port adapter on the Cisco 7200 series routers.
12.2(7)	Support was added for the PA-A3 port adapter on the Cisco 7500 series routers.

Usage Guidelines

This command applies to ATM configuration on the Cisco MC3810 and the PA-A3 port adapter on the Cisco 7200 and 7500 series routers.

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.
	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 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** command in interface configuration mode. 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	Keyword	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** command in interface configuration mode. 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 circuit

To configure the connection attributes for the constant bit rate (CBR) interface, use the **ces circuit** command in interface configuration mode. 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 | no cas] [cdv range] [circuit-name name] [on-hook-detection hex-number] [partial-fill range] [shutdown | no shutdown] [timeslots range]
```

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

Syntax Description	
<i>circuit-number</i>	Selects the circuit identification. For unstructured service, use 0. For T1 structured service, the range is from 1 to 24. For E1 structure service, the range is from 1 to 31.
cas	(Optional) Enables channel-associated signaling for structured service only. no cas disables channel-associated signaling. The default is no cas .
no cas	(Optional) Disables channel-associated signaling for structured service only. This is the default.
cdv <i>range</i>	(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 <i>name</i>	(Optional) Sets the ASCII name for the circuit emulation service internetworking function CES-IWF circuit. The string for the circuit name ranges from 0 to 255. The default is CBRx/x:0.
on-hook-detection <i>hex-number</i>	(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 <i>range</i>	(Optional) Enables the partial AAL1 cell fill service for structured service only. The range is from 0 to 47. The default is 47.
shutdown	(Optional) Marks the CES-IWF circuit administratively down. The default is no shutdown .
no shutdown	(Optional) Returns the CES-IWF circuit to an administrative up state.
timeslots <i>range</i>	(Optional) Configures the time slots for the CES-IWF circuit for structured service only. The range is from 1 to 24 for T1. The range is from 1 to 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.
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** command in interface configuration mode. 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** command in interface configuration mode. 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** command in interface configuration mode. 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	<i>length</i>	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.
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Defaults	0_110 feet
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Command Modes	Interface configuration
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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.
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Examples	The following example sets the cable length to 440 feet:
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```
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** command in interface configuration mode. 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** command in interface configuration mode. 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** command in interface configuration mode. 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 signaling in-band on individual time slots by removing the low bit of each byte for signaling 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 signaling and robbed-bit signaling:

```
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	<i>octets</i>	Number of user octets per cell for the CES. Possible values of octet range from 0 to 47. The default is 47.
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Defaults	47 octets
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Command Modes	Interface configuration
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Command History	Release	Modification
	11.3 MA	This command was introduced.

Usage Guidelines	<p>This command applies to ATM configuration on the Cisco MC3810.</p> <p>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.</p>
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Examples	The following example sets the CES partial cell fill to 20 octets per cell for serial port 0:
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```
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** command in interface configuration mode. 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

<i>circuit-number</i>	Selects the circuit identification. The range is from 0 to 24. For unstructured service, use 0. For T1 structure service, the range is from 1 to 24. For E1 structure service, the range is from 1 to 31.
interface atm <i>slot/port</i>	Slot and port number of the ATM interface. The slash (/) is required. 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 <i>number</i>	Virtual path identifier of the destination PVC. Range is from 0 to 255.
vci <i>number</i>	Virtual channel identifier of the destination PVC. Range is from 1 to 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.

ces

To configure circuit emulation service (CES) on a router port and enter CES configuration mode, use the **ces** command in global configuration mode.

```
ces slot/port
```

Syntax Description

<i>slot/port</i>	Backplane slot number and port number on the interface. The port value is always 0 because the interface configuration applies to all ports in the slot. The slash (/) is required.
------------------	---

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-cdv

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

ces-cdv *time*

Syntax Description	<i>time</i>	Maximum tolerable cell arrival jitter with a range from 1 to 65535 microseconds. Default is 5000.
---------------------------	-------------	---

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.	

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

<i>vc-class-name</i>	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 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-int classA
```

Related Commands

Command	Description
protocol (ATM)	Configures a static map for an ATM PVC, SVC, VC class, or VC bundle and enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC.
show atm map	Displays the list of all configured ATM static maps to remote hosts on an ATM network.
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

<i>vc-class-name</i>	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 use 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
class-bundle	Configures a VC bundle with the bundle-level commands contained in the specified VC class.
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.
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 privileged EXEC mode.

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

Syntax Description

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

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

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

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
```

clear atm vc

To release a specified switched virtual circuit (SVC), use the **clear atm vc** command in privileged EXEC mode.

```
clear atm vc vcd
```

Syntax Description

<i>vcd</i>	Virtual channel descriptor of the channel to be released.
------------	---

Command Modes

Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.

Usage Guidelines

For multicast or control virtual channel connections (VCCs), this command causes the LAN emulation (LANE) client to exit and rejoin an emulated LAN.

For data VCCs, this command also removes the associated LAN Emulation Address Resolution Protocol (LE ARP) table entries.

Examples

The following example shows how to release SVC 1024:

```
Router# clear atm vc 1024
```

clear lane le-arp

To clear the dynamic LAN Emulation Address Resolution Protocol (LE ARP) table or a single LE ARP entry of the LANE client configured on the specified subinterface or emulated LAN, use the **clear lane le-arp** command in user EXEC or privileged EXEC mode.

Cisco 7500 Series

```
clear lane le-arp [interface slot/port [.subinterface-number] | name elan-name] [mac-address mac-address | route-desc segment segment-number bridge bridge-number]
```

Cisco 4500 and 4700 Routers

```
clear lane le-arp [interface number [.subinterface-number] | name elan-name] [mac-address mac-address | route-desc segment segment-number bridge bridge-number]
```

Syntax Description

interface <i>slot/port</i> [<i>.subinterface-number</i>]	(Optional) Interface or subinterface for the LAN emulation (LANE) client whose LE ARP table or entry is to be cleared for the Cisco 7500 series routers. The space between the interface keyword and the <i>slot</i> argument is optional.
interface <i>number</i> [<i>.subinterface-number</i>]	(Optional) Interface or subinterface for the LANE client whose LE ARP table or entry is to be cleared for the Cisco 4500 or 4700 routers. The space between the interface keyword and the <i>number</i> argument is optional.
name <i>elan-name</i>	(Optional) Name of the emulated LAN for the LANE client whose LE ARP table or entry is to be cleared. Maximum length is 32 characters.
mac-address <i>mac-address</i>	(Optional) Keyword and MAC address of the LANE client.
route-desc segment <i>segment-number</i>	(Optional) Keywords and LANE segment number. The segment number ranges from 1 to 4095.
bridge <i>bridge-number</i>	(Optional) Keyword and bridge number that is contained in the route descriptor. The bridge number ranges from 1 to 15.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.

Usage Guidelines

This command removes dynamic LE ARP table entries only. It does not remove static LE ARP table entries.

If you do not specify an interface or an emulated LAN, this command clears all the LE ARP tables of any LANE client in the router.

If you specify a major interface (not a subinterface), this command clears all the LE ARP tables of every LANE client on all the subinterfaces of that interface.

This command also removes the fast-cache entries built from the LE ARP entries.

Examples

The following example shows how to clear all the LE ARP tables for all clients on the router:

```
Router# clear lane le-arp
```

The following example shows how to clear all the LE ARP tables for all LANE clients on all the subinterfaces of interface 1/0:

```
Router# clear lane le-arp interface 1/0
```

The following example shows how to clear the entry corresponding to MAC address 0800.aa00.0101 from the LE ARP table for the LANE client on the emulated LAN named red:

```
Router# clear lane le-arp name red 0800.aa00.0101
```

The following example shows how to clear all dynamic entries from the LE ARP table for the LANE client on the emulated LAN named red:

```
Router# clear lane le-arp name red
```

The following example shows how to clear the dynamic entry from the LE ARP table for the LANE client on segment number 1, bridge number 1 in the emulated LAN named red:

```
Router# clear lane le-arp name red route-desc segment 1 bridge 1
```



Note

MAC addresses are written in the same dotted notation for the **clear lane le-arp** command as they are for the global IP **arp** command.

clear lane server

To force a LAN emulation (LANE) server to drop a client and allow the LANE configuration server to assign the client to another emulated LAN (ELAN), use the **clear lane server** command in user EXEC or privileged EXEC mode.

Cisco 7500 Series

```
clear lane server {interface slot/port [.subinterface-number] | name elan-name} [mac-address
mac-address | client-atm-address atm-address | lecid lane-client-id | route-desc segment
segment-number bridge bridge-number]
```

Cisco 4500 and 4700 Routers

```
clear lane server {interface number [.subinterface-number] | name elan-name} [mac-address
mac-address | client-atm-address atm-address | lecid lecid | route-desc segment
segment-number bridge bridge-number]
```

Syntax Description

interface <i>slot/port</i> [.subinterface-number]	Interface or subinterface where the LANE server is configured for the Cisco 7500 series. The space between the interface keyword and the <i>slot</i> argument is optional.
interface <i>number</i> [.subinterface-number]	Interface or subinterface where the LANE server is configured for the Cisco 4500 or 4700 routers. The space between the interface keyword and the <i>number</i> argument is optional.
name <i>elan-name</i>	Name of the emulated LAN on which the LANE server is configured. Maximum length is 32 characters.
mac-address <i>mac-address</i>	(Optional) Keyword and MAC address of the LANE client.
client-atm-address <i>atm-address</i>	(Optional) Keyword and ATM address of the LANE client.
lecid <i>lane-client-id</i>	(Optional) Keyword and ID of the LANE client. The LANE client ID is a value from 1 to 4096.
route-desc segment <i>segment-number</i>	(Optional) Keywords and LANE segment number. The segment number ranges from 1 to 4095.
bridge <i>bridge-number</i>	(Optional) Keyword and bridge number that is contained in the route descriptor. The bridge number ranges from 1 to 15.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.

Usage Guidelines

After changing the bindings on the configuration server, use this command on the LANE server to force the client to leave one emulated LAN. The LANE server will drop the Control Direct and Control Distribute virtual channel connections (VCCs) to the LANE client. The client will then ask the LANE configuration server for the location of the LANE server of the emulated LAN it should join.

If no LANE client is specified, all LANE clients attached to the LANE server are dropped.

Examples

The following example shows how to force all the LANE clients on the emulated LAN named red to be dropped. The next time they try to join, they will be forced to join a different emulated LAN.

```
Router# clear lane server name red
```

Related Commands

Command	Description
client-atm-address name	Adds a LANE client address entry to the configuration database of the configuration server.
lane database	Creates a named configuration database that can be associated with a configuration server.
mac-address	Sets the MAC layer address of the Cisco Token Ring.
show lane server	Displays global information for the LANE server configured on an interface, on any of its subinterfaces, on a specified subinterface, or on an ELAN.

clear mpoa client cache

To clear the ingress and egress cache entries of one or all Multiprotocol over ATM (MPOA) Clients MPCs, use the **clear mpoa client cache** command in user EXEC or privileged EXEC mode.

```
clear mpoa client [name mpc-name] cache [ingress | egress] [ip-address ip-address]
```

Syntax Description

name <i>mpc-name</i>	(Optional) Specifies the name of the MPC with the specified name.
ingress	(Optional) Clears ingress cache entries associated with the MPC.
egress	(Optional) Clears egress cache entries associated with the MPC.
ip-address <i>ip-address</i>	(Optional) Clears matching cache entries with the specified IP address.

Defaults

The system defaults are:

- All MPC cache entries are cleared.
- Both caches are cleared.
- Entries matching only the specified destination IP address are cleared.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.3(3a)WA4(5)	This command was introduced.

Examples

The following example shows how to clear the ingress and egress cache entries for the MPC named ip_mpc:

```
Router# clear mpoa client name ip_mpc cache
```

Related Commands

Command	Description
show mpoa client cache	Displays the ingress or egress cache entries matching the IP addresses for the MPCs.

clear mpoa server cache

To clear the ingress and egress cache entries, use the **clear mpoa server cache** command in user EXEC or privileged EXEC mode.

```
clear mpoa server [name mps-name] cache [ingress | egress] [ip-address ip-address]
```

Syntax Description	name <i>mps-name</i>	(Optional) Specifies the name of the Multiprotocol over ATM (MPOA) Server (MPS). If this keyword is omitted, this command will apply to all servers.
	ingress	(Optional) Clears ingress cache entries associated with the MPS.
	egress	(Optional) Clears egress cache entries associated with the MPS.
	ip-address <i>ip-address</i>	(Optional) Clears matching cache entries with the specified IP address. If this keyword is omitted, this command will clear all entries.

Command Modes	User EXEC Privileged EXEC
---------------	------------------------------

Command History	Release	Modification
	11.3(3a)WA4(5)	This command was introduced.

Examples The following example shows how to clear all cache entries:

```
Router# clear mpoa server cache
```

Related Commands	Command	Description
	show mpoa server cache	Displays ingress and egress cache entries associated with the MPS.

clear pppatm interface atm

To clear PPP ATM sessions on an ATM interface, use the **clear pppatm interface atm** command in privileged EXEC mode.

```
clear pppatm interface atm interface-number [.subinterface-number] [vc {[vpi]/vci | virtual-circuit-name}]
```

Syntax Description		
<i>interface-number</i>		ATM interface number.
<i>.subinterface-number</i>		(Optional) ATM subinterface number. A period must precede the number.
vc [<i>vpi</i>]/ <i>vci</i>		(Optional) Specifies virtual circuit (VC) by virtual path identifier (VPI) and virtual channel identifier (VCI). A slash must follow the VPI.
<i>virtual-circuit-name</i>		(Optional) Specifies VC by name.

Command Modes	
	Privileged EXEC

Command History	Release	Modification
	12.2(13)T	This command was introduced.

Usage Guidelines	
	This command clears the PPP over ATM (PPPoA) sessions in an interface, or in a VC when the VC is specified.

When the **clear pppatm interface atm** command is used to clear sessions on an interface, PPP keepalives continue to work and can be used to detect a broken link.

Examples	
	The following example clears a PPP ATM session on ATM interface 1/0.10:

```
Router# clear pppatm interface atm 1/0.10
```

Related Commands	Command	Description
	debug pppatm	Enables reports for PPPoA events, errors, and states either globally or conditionally on an interface or VC.
	show pppatm summary	Displays PPPoA session counts.

client-atm-address name

To add a LAN emulation (LANE) client address entry to the configuration server's configuration database, use the **client-atm-address name** command in database configuration mode. To remove a client address entry from the table, use the **no** form of this command.

client-atm-address *atm-address-template* **name** *elan-name*

no client-atm-address *atm-address-template*

Syntax Description

<i>atm-address-template</i>	Template that explicitly specifies an ATM address or a specific part of an ATM address and uses wildcard characters for other parts of the ATM address, making it easy and convenient to specify multiple addresses matching the explicitly specified part. Wildcard characters can replace any nibble or group of nibbles in the prefix, the end-system identifier (ESI), or the selector fields of the ATM address.
name <i>elan-name</i>	Name of the emulated LAN. Maximum length is 32 characters.

Defaults

No address and no emulated LAN name are provided.

Command Modes

Database configuration

Command History

Release	Modification
11.0	This command was introduced.

Usage Guidelines

The effect of this command is to bind any client whose address matches the specified template into the specified emulated LAN. When a client comes up, it consults the LANE configuration server, which responds with the ATM address of the LANE server for the emulated LAN. The client then initiates join procedures with the LANE server.

Before this command is used, the emulated LAN specified by the *elan-name* argument must have been created in the configuration server's database by use of the **name server-atm-address** command.

If an existing entry in the configuration server's database binds the LANE client ATM address to a different emulated LAN, the new command is rejected.

This command affects only the bindings in the named configuration server database. It has no effect on the LANE components themselves.

See the **lane database** command for information about creating the database, and the **name server-atm-address** command for information about binding the emulated LAN's name to the server's ATM address.

The **client-atm-address name** command is a subcommand of the global **lane database** command.

ATM Addresses

A LANE ATM address has the same syntax as a network service access point (NSAP), but it is not a network-level address. It consists of the following:

- A 13-byte prefix that includes the following fields defined by the ATM Forum:
 - AFI (Authority and Format Identifier) field (1 byte), DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes), DFI (Domain Specific Part Format Identifier) field (1 byte), Administrative Authority field (3 bytes), Reserved field (2 bytes), Routing Domain field (2 bytes), and the Area field (2 bytes)
- A 6-byte ESI
- A 1-byte selector field

Address Templates

LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character (nibble), and an ellipsis (...) to match any number of leading, middle, or trailing characters. The values of the characters replaced by wildcards come from the automatically assigned ATM address.

In LANE, a *prefix template* explicitly matches the prefix but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field but uses wildcards for the prefix and selector.

In our implementation of LANE, the prefix corresponds to the switch, the ESI corresponds to the ATM interface, and the selector field corresponds to the specific subinterface of the interface.

Examples

The following example shows how to use an ESI template to specify the part of the ATM address corresponding to the interface. This example allows any client on any subinterface of the interface that corresponds to the displayed ESI value, no matter to which switch the router is connected, to join the emulated LAN named engineering:

```
ATM(lane-config-database)# client-atm-address ...0800.200C.1001.** name engineering
```

The following example shows how to use a prefix template to specify the part of the ATM address corresponding to the switch. This example allows any client on a subinterface of any interface connected to the switch that corresponds to the displayed prefix to join the emulated LAN named marketing:

```
ATM(lane-config-database)# client-atm-address 47.000014155551212f.00.00... name marketing
```

Related Commands

Command	Description
default-name	Provides an ELAN name in the database of the configuration server for those client MAC addresses and client ATM addresses that do not have explicit ELAN name bindings.
lane database	Creates a named configuration database that can be associated with a configuration server.
mac-address	Sets the MAC layer address of the Cisco Token Ring.
name server-atm-address	Specifies or replaces the ATM address of the LANE server for the ELAN in the configuration database of the configuration server.

dbns enable

To apply Dynamic Subscriber Bandwidth Selection (DBS) QoS parameters, use the **dbns enable** command in the appropriate configuration mode. To remove DBS QoS parameters, use the **no** form of this command.

dbns enable

no dbns enable

Syntax Description

This command has no arguments or keywords.

Defaults

DBS QoS parameters are not applied.

Command Modes

ATM VC class configuration
 ATM VC configuration
 ATM PVC range configuration
 ATM PVC-in-range configuration

Command History

Release	Modification
12.2(4)B	This command was introduced.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Usage Guidelines

The **no dbns enable** command configured in any configuration mode overrides the **dbns enable** command configured in any configuration mode. Both the **dbns enable** and **no dbns enable** commands are saved in the running configuration and appear, when configured, in the output of the **show running-config** command. The **default dbns enable** command does not appear in the output of the **show running-config** command when configured.

When you enter the **dbns enable** or **no dbns enable** command, existing sessions are not disconnected. If you have a session that has been configured for DBS and you configure the **no dbns enable** command on a VC, additional sessions that are configured will display DBS-configured QoS values until the first new session is up. After the first session is brought up, the VC has default and locally configured values. If you configure the **dbns enable** command after multiple sessions are already up on the VC, all sessions on that VC have DBS QoS parameters.

RADIUS QoS attributes are applied to PVCs when a new PPP over Ethernet (PPPoE) session has peak cell rate (PCR) and sustainable cell rate (SCR) values that are higher than existing PPPoE sessions. If a new PPPoE session with lower PCR and SCR values is added to a PVC, the RADIUS QoS attributes are not applied to the new session. If the user of the PPPoE session that has the higher PCR and SCR values logs out, the QoS attributes are set to those of the lower bandwidth user.

RADIUS QoS attributes override attributes on a PVC configured in ATM PVC-in-range or ATM PVC range configuration mode. If the RADIUS QoS attributes cannot be applied to a PVC, PPPoE and PPPoA sessions cannot be established.

When DBS is configured, normal ATM precedences apply. PVC configurations take precedence over VC class configurations. Thus, if DBS QoS parameters are applied on a VC class and disabled on one PVC in that VC class, DBS QoS parameters are not applied on the PVC. ATM PVC-in-range configurations take precedence over PVC range configurations.

When you configure DBS on a PVC, existing sessions on that PVC remain connected.

Examples

The following example configures DBS in ATM VC class configuration mode:

```
vc-class atm pppoe
dbs enable
```

The following example configures DBS in ATM VC configuration mode:

```
interface atm0/0/0.5 point-to-point
ip address 10.0.0.0 255.255.255.0
pvc 0/100
dbs enable
protocol pppoe
```

The following example configures DBS in ATM PVC range configuration mode:

```
interface atm0/0/0.1 multipoint
ip address 10.0.0.0 255.255.255.0
range pvc 0/50 0/70
dbs enable
```

The following example configures DBS in ATM PVC-in-range configuration mode:

```
interface atm0/0/0.1 multipoint
range pvc 0/50 0/70
pvc-in-range 60
dbs enable
```

Related Commands

Command	Description
pvc	Creates or assigns a name to an ATM PVC, specifies the encapsulation type on an ATM PVC, or enters interface-ATM-VC configuration mode.
pvc-in-range	Configures an individual PVC within a PVC range.
range pvc	Defines a range of ATM PVCs.
show atm pvc dbs	Displays all ATM PVCs on which DBS QoS parameters are applied.
vc-class atm	Configures a VC class for an ATM VC or interface.

default-name

To provide an emulated LAN name in the configuration server's database for those client MAC addresses and client ATM addresses that do not have explicit emulated LAN name bindings, use the **default-name** command in database configuration mode. To remove the default name, use the **no** form of this command.

default-name *elan-name*

no default-name

Syntax Description	<i>elan-name</i>	Default emulated LAN name for any LAN emulation (LANE) client MAC address or LANE client ATM address not explicitly bound to any emulated LAN name. Maximum length is 32 characters.
---------------------------	------------------	--

Defaults	No name is provided.
-----------------	----------------------

Command Modes	Database configuration
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Command History	Release	Modification
	11.0	This command was introduced.

Usage Guidelines

This command affects only the bindings in the configuration server's database. It has no effect on the LANE components themselves.

The named emulated LAN must already exist in the configuration server's database before this command is used. If the default name-to-emulated LAN name binding already exists, the new binding replaces it.

The **default-name** command is a subcommand of the global **lane database** global configuration command.

Examples

The following example shows how to specify the emulated Token Ring LAN named man as the default emulated LAN. Because none of the emulated LANs are restricted, clients are assigned to whichever emulated LAN they request. Clients that do not request a particular emulated LAN will be assigned to the named man emulated LAN.

```
lane database example2
name eng server-atm-address 39.000001415555121101020304.0800.200c.1001.02
name eng local-seg-id 1000
name man server-atm-address 39.000001415555121101020304.0800.200c.1001.01
name man local-seg-id 2000
name mkt server-atm-address 39.000001415555121101020304.0800.200c.4001.01
name mkt local-seg-id 3000
default-name man
```

Related Commands

Command	Description
client-atm-address name	Adds a LANE client address entry to the configuration database of the configuration server.
lane database	Creates a named configuration database that can be associated with a configuration server.
mac-address name	Sets the MAC layer address of the Cisco Token Ring.
server-atm-address	Specifies or replaces the ATM address of the LANE server for the ELAN in the configuration database of the configuration server.

dxi map

To map a protocol address to a given virtual path identifier (VPI) and virtual channel identifier (VCI), use the **dxi map** command in interface configuration mode. 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

<i>protocol</i>	One of the following bridging or protocol keywords: appletalk , bridge , clns , decnet , ip , or novell .
<i>protocol-address</i>	Protocol-specific address.
<i>vpi</i>	Virtual path identifier in the range from 0 to 15.
<i>vci</i>	Virtual circuit identifier in the range from 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.
12.2(13)T	The apollo , vines , and xns arguments were removed because Apollo Domain, Banyan VINES, and Xerox Network Systems are no longer supported in the Cisco IOS software.

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.

dxl pvc

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

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

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

Syntax Description

<i>vpi</i>	ATM network virtual path identifier (VPI) of this permanent virtual circuit (PVC), in the range from 0 to 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 <i>vpi</i> and <i>vci</i> cannot be specified as 0; if one is 0, the other cannot be 0.
<i>vci</i>	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 <i>vpi</i> and <i>vci</i> 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 dxl 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 (ATM)

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

```
encapsulation { aal2 | aal5auto | aal5autopp virtual-template number [group group-name] | aal5ciscopp virtual-template number | aal5mux protocol | aal5nlpid | aal5snap }
```

```
no encapsulation { aal2 | aal5auto | aal5autopp virtual-template number [group group-name] | aal5ciscopp virtual-template number | aal5mux protocol | aal5nlpid | aal5snap }
```

Syntax Description		
aal2		AAL and encapsulation type for PVCs dedicated to AAL2 Voice over ATM.
aal5auto		AAL and encapsulation type for PPP over ATM (PPPoA) switched virtual circuits (SVCs). Enables an ATM SVC to use either aal5snap or aal5mux encapsulation options.
aal5autopp		Enables PPPoA/PPPoE autosense. PPPoA/PPPoE autosense enables a router to distinguish between incoming PPPoA and PPP over Ethernet (PPPoE) sessions and create virtual access for both PPP types based on demand.
virtual-template <i>number</i>		Number used to identify the virtual template.
group		(Optional) Specifies that a PPPoE profile will be used by PPPoE sessions on the interface.
<i>group-name</i>		(Optional) Name of the PPPoE profile to be used by PPPoE sessions on the interface.
aal5ciscopp		AAL and encapsulation type for Cisco PPP over ATM. Supported on ATM PVCs only.
aal5mux		AAL and encapsulation type for multiplex (MUX)-type VCs. A protocol must be specified when using this encapsulation type.
<i>protocol</i>		Protocol type being used by the MUX-encapsulated VC. Possible values for the <i>protocol</i> argument are as follows: <ul style="list-style-type: none"> • appletalk—AppleTalk protocol. • decnet—DECnet protocol. • frame-relay—Frame Relay-ATM Network Interworking (FRF.5) on the Cisco MC3810. • fr-atm-srv—Frame Relay-ATM Service Interworking (FRF.8) on the Cisco MC3810. • ip—IP protocol. • ipx—IPX protocol. • ppp virtual-template <i>number</i>—Internet Engineering Task Force (IETF)-compliant PPP over ATM. Use the virtual-template <i>number</i> options to identify the virtual template. Supported on ATM PVCs only. • voice—Voice over ATM.

aal5nlpid	AAL and encapsulation type that 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.
aal5snap	AAL and encapsulation type that supports Inverse ARP. Logical Link Control/Subnetwork Access Protocol (LLC/SNAP) precedes the protocol datagram.

Defaults

The global default encapsulation option is **aal5snap**. See the “Usage Guidelines” section for other default characteristics.

Command Modes

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 aal5mux frame and aal5mux voice keywords were added for the Cisco MC3810 series router.
12.0(7)XK	Support for the aal5mux voice option was added to Cisco 3600 series routers.
12.0(7)T	The aal5mux fr-atm-srv option was added for the Cisco MC3810 router. The aal5mux frame option was changed to aal5mux frame-relay .
12.1(1)XA	Support for the aal2 option was added to the Cisco MC3810 router.
12.1(3)T	The aal5auto option was added to provide encapsulation configuration for PPP over ATM SVCs.
12.1(5)XM	Support for the aal2 option was added to the Cisco AS5300 access server and Cisco 3600 multiservice platforms.
12.1(5)T	The aal5ciscoppp , aal5mux , and aal5snap options were made available in PVC range and PVC-in-range configuration modes.
12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
12.1(1)DC1	The aal5autopp option was introduced on the Cisco 6400 universal access concentrator.
12.2(4)T	The aal5autopp option was implemented in Cisco IOS Release 12.2(4)T.
12.2(13)T	The apollo , vines , and xns values were removed as options for the <i>protocol</i> argument because Apollo Domain, Banyan VINES, and Xerox Network Systems are no longer supported in the Cisco IOS software.
12.2(15)T	The group option was added.
12.3(7)XI3	This command was integrated into Cisco IOS Release 12.3(7)XI3.

Usage Guidelines



Note

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

Use the **aal5mux** encapsulation option to dedicate the specified PVC to a single protocol; use the **aal5snap** encapsulation option to multiplex two or more protocols over the same PVC. Whether you select **aal5mux** or **aal5snap** 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, **aal5snap** might be the appropriate choice. If pricing depends on the number of bytes transmitted, **aal5mux** might be the appropriate choice because it has slightly less overhead.

Encapsulation for PPPoA

When configuring Cisco PPP over ATM, use the **aal5ciscoppp** keyword 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 that 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.

Configuring PPPoA/PPPoE Autosense

Use the **encapsulation aal5autopp virtual-template *template-number*** command to configure PPPoA/PPPoE autosense. PPPoA/PPPoE autosense enables a router to distinguish between incoming PPPoA and PPPoE sessions and create virtual access for both PPP types based on demand.

If a PPPoE profile is not specified by using the **group *group-name*** option, PPPoE sessions will be established using parameters from the global PPPoE profile. PPPoE profiles must be configured using the **bba-group pppoe** command.



Note

Do not use this command on a router that initiates PPPoA sessions.

Entering the **no encapsulation aal5autopp virtual-template** command will terminate the PPPoA or PPPoE session and detach the virtual-access interface from the PVC.

Configuring Encapsulation for VC Bundles

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

A VC bundle can have only one encapsulation configured for it: either **aal5snap** or **aal5mux**.

Encapsulation Rules of Precedence

If the **encapsulation** 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** command in a VC class assigned to the PVC, PVC bundle, or SVC itself.

- Configuration of the **encapsulation** command in a VC class assigned to the ATM subinterface of the PVC, SVC, or VC bundle.
- Configuration of the **encapsulation** command in a VC class assigned to the ATM main interface of the PVC, SVC, or VC bundle.
- Global encapsulation option default: **aal5snap**

**Note**

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

Configuring Encapsulation for a PVC Range

When a PVC range or an individual PVC within a PVC range is being configured, the following options are available:

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

Examples**MUX-Type Encapsulation on a VC Example**

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

```
interface atm 1/0
 pvc 0/33
  encapsulation aal5mux ip
```

SNAP Encapsulation Example

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

```
bundle chicago
 encapsulation aal5snap
```

PPP over ATM SVCs Example

The following example configures an ATM SVC called “chicago” with the encapsulation type **aal5auto**. Encapsulation type **aal5auto** enables the SVC to use PPP and either **aal5snap** or **aal5mux** encapsulation.

```
interface ATM 2/0/0
 svc chicago
  encapsulation aal5auto
```

PPPoA/PPPoE Autosense Example

The following example enables PPPoA/PPPoE autosense on PVC 30/33. PPPoA sessions will use virtual template 1, and PPPoE sessions will use the global PPPoE profile.

```
interface ATM 0/0/0.33 multipoint
 pvc 30/33
  encapsulation aal5autopp virtual-template 1
!
bba-group pppoe global
 virtual-template 1
 sessions max limit 8000
 sessions per-vc limit 8
 sessions per-mac limit 2
```

AAL2 Voice over ATM Example

The following example configures a PVC to support AAL2 encapsulation for Voice over ATM:

```
interface ATM0.2 point-to-point
 pvc 2/200
  vbr-rt 760 760 100
  encapsulation aal2
```

Related Commands

Command	Description
bba-group pppoe	Creates a PPPoE profile.
broadcast	Configures broadcast packet duplication and transmission for an ATM VC class, PVC, SVC, or VC bundle.
class-vc	Assigns a VC class to an ATM PVC, SVC, or VC bundle member.
debug pppoe	Displays debugging information for PPPoE sessions.
inarp	Configures the Inverse ARP time period for an ATM PVC, VC class, or VC 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 and enables Inverse ARP or Inverse ARP broadcasts on an ATM PVC.

encapsulation atm-dxi

To enable ATM-Data Exchange Interface (DXI) encapsulation, use the **encapsulation atm-dxi** command in interface configuration mode. 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.

framer-type

To set the framer type of supported circuit emulation service (CES) multiservice interchange (MIX) connections to T1 or E1, use the **framer-type** command in CES configuration mode.

framer-type {**t1** | **e1**}

Syntax Description

t1	Sets the framer type of supported CES connections to T1.
e1	Sets the framer type of supported CES connections to E1.

Defaults

T1

Command Modes

CES configuration

Command History

Release	Modification
12.1(5)XM	This command was introduced for the Cisco 3660.
12.2(4)T	This command was integrated into Cisco IOS Release 12.2(4)T.

Usage Guidelines

This command is needed only with CES-enabled network modules (ATM OC-3 CES network modules) that do *not* contain Cisco T1/E1 multiflex voice/WAN interface cards (VWICs) on the Cisco 3660. Other network modules set their framer type automatically and therefore do not require use of this command. It is also not necessary to use this command for T1 connections, because **t1** is the default argument.

To reach CES configuration mode for a particular slot, enter **ces** and the slot number and port number while in global configuration mode. Note that the port value is always 0, as the interface configuration applies to all ports in the slot.

Examples

The following example sets the framer type of the CES card in slot 1 to E1:

```
Router(config)# ces 1/0
Router(config-ces)# framer-type e1
```

Related Commands

Command	Description
ces	Configures CES on a router port and enters controller configuration mode.

holding-time

To specify the holding time value for the MPS-p7 variable of a Multiprotocol over ATM server (MPS), use the **holding-time** command in MPS configuration mode. To revert to the default value, use the **no** form of this command.

holding-time *seconds*

no holding-time *seconds*

Syntax Description	<i>seconds</i>	Specifies the holding time value in seconds. The default is 1200 seconds.
---------------------------	----------------	---

Defaults	The default holding time is 1200 seconds (20 minutes).
-----------------	--

Command Modes	MPS configuration
----------------------	-------------------

Command History	Release	Modification
	11.3(3a)WA4(5)	This command was introduced.

Examples	<p>The following example shows how to set the holding time to 600 seconds (10 minutes):</p> <pre>holding-time 600</pre>
-----------------	---

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

<i>seconds</i>	Number of seconds that the SVC is idle, after which the ATM SVC is disconnected.
<i>minimum-rate</i>	(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	<i>number</i>	Number of links; a value from 1 to 8.
--------------------	---------------	---------------------------------------

Defaults	Links: 1
----------	----------

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** command in interface configuration mode. 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	Sets the transmit clocks for all the links in the group to be derived from the same source.
<i>port</i>	Link that will provide clocking for the IMA group (called the command link). If the common link fails, the system automatically chooses one of the remaining active links to provide clocking.
independent	Sets the transmit clock source for at least one link in the IMA group to be 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	This command was implemented on Cisco 7200 and 7500 series routers.
12.0(7)XE1	This command was implemented on Cisco 7100 series routers.
12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was implemented in 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** command in interface configuration mode. To restore the default setting, use the **no** form of this command.

ima differential-delay-maximum *milliseconds*

no ima differential-delay-maximum *milliseconds*

Syntax Description	<i>msec</i>	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
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Defaults	25 milliseconds
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Command Modes	Interface configuration
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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	This command was implemented on Cisco 7200 and 7500 series routers.
	12.0(7)XE1	This command was implemented on Cisco 7100 series routers.
	12.1(5)T	Support for Cisco 7100, 7200, and 7500 series routers was implemented in 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 inverse multiplexing over ATM (IMA) frames, use the **ima frame-length** interface configuration command. 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

IMA frames are numbered sequentially, and each contains an IMA Control Protocol (ICP) cell at a specific position.

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 test

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

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

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

Syntax Description	
<i>link port</i>	(Optional) The identifier for the interface where the physical link is located.
<i>pattern pattern-id</i>	(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.

ima-group

To define physical links as inverse multiplexing over ATM (IMA) group members, use the **ima-group** command in interface configuration mode 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

<i>group-number</i>	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.

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

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 atm-dxi	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 ima

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

```
interface atm slot/imagroup-number
```

Syntax	Description
<i>slot/</i>	Specifies the slot location of the ATM IMA network module. The values range from 0 to 5 depending on the router.
<i>group-number</i>	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.

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

interface atm

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

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

Syntax Description

<i>interface-number</i>	Specifies a (physical) ATM interface (for example, 3/0).
<i>.subinterface-number</i>	(Optional) Specifies a subinterface number. A dot (.) must be used to separate the <i>interface-number</i> from the <i>subinterface-number</i> (for example 2/0.1).
mpls	(Optional) Specifies MPLS as the interface type for which a subinterface is to be created.
multipoint	(Optional) Specifies multipoint as the interface type for which a subinterface is to be created.
point-to-point	(Optional) Specifies point-to-point as the interface type for which a subinterface is to be created.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.
12.1(3)T	New optional subinterface types were introduced.

Usage Guidelines

The **interface atm** command enables you to define a subinterface for a specified type of ATM interface. The subinterface for the ATM interface is created the first time this command is issued with a specified subinterface number.

Examples

For physical ATM interface 3/0, the following command creates an ATM MPLS subinterface having subinterface number 1:

```
Router# interface atm 3/0.1 mpls
```

Related Commands

Command	Description
show interfaces atm	Displays information about the ATM interface.
show mpls interfaces	Displays information about one or more MPLS interfaces that have been configured for label switching.

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** command in global configuration mode.

```
interface cbr slot/port
```

Syntax Description

<i>slot</i>	Backplane slot number. The slash (/) must be typed.
<i>port</i>	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.

keepalive-lifetime

To specify the duration that a keepalive message from a Multiprotocol over ATM server (MPS) is considered valid by the Multiprotocol over ATM client (MPC), use the **keepalive-lifetime** command in global configuration mode.

keepalive-lifetime *seconds*

Syntax Description	<i>seconds</i>	Time (in seconds) for the MPS-p2 variable of the MPS. The default value is 35 seconds.
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Defaults	The default is 35 seconds.	
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Command Modes	Global configuration	
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Command History	Release	Modification
	12.0(3)T	This command was introduced.

Usage Guidelines	The keepalive lifetime (MPS-p2) must be greater than or equal to three times the value of the keepalive time (MPS-p1). MPS-p1 specifies the frequency with which a keepalive message is sent from the MPS to the MPC.
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Examples	The following example shows how to specify a keepalive lifetime of 60 seconds: <pre>Router(config)# keepalive-lifetime 60</pre>
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Related Commands	Command	Description
	keepalive-time	Specifies the keepalive time value for the MPS-p1 variable of an MPS.

keepalive-time

To specify the keepalive time value for the Multiprotocol over ATM (MPOA) server (MPS)-p1 variable of an MPS, use the **keepalive-time** command in MPS configuration mode. To revert to the default value, use the **no** form of this command.

keepalive-time *seconds*

no keepalive-time *seconds*

Syntax Description	<i>seconds</i>	Specifies the keepalive time value (in seconds). The default value is 10 seconds.
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Defaults The default keepalive time is 10 seconds.

Command Modes MPS configuration

Command History	Release	Modification
	11.3(3a)WA4(5)	This command was introduced.

Examples The following example shows how to set the keepalive time to 25 seconds:

```
Router (mpoa-server-config) # keepalive-time 25
```

