main-fiber port

To specify the port number to use for the optical link connection on the SDH/STM-1 trunk card on a Cisco AS5850, use the **main-fiber port** command in controller configuration mode.

main-fiber port {**0** | **1**}

Syntax Description

0	Specifies use of port 0 as the optical link connection. This is the default.
1	Specifies use of port 1 as the optical link connection.

Defaults

Port 0

Command Modes

Controller configuration

Command History

Release	Modification
12.2(15)T	This command was introduced.

Usage Guidelines

Use the **main-fiber** controller configuration command if you need to use optical port 1 during installation of the SDH/STM-1 trunk card on a Cisco AS5850 or if you suspect some problem with optical port 0.

This command does not have a **no** form. To restore the default value, use the **main-fiber port 0** command.

Examples

The following example selects port 1 as the port with the optical connection:

```
Router(config)# controller sonet 1/0
Router(config-controller)# main-fiber port 1
```

mdl

To configure the Maintenance Data Link (MDL) message defined in the ANSI T1.107a-1990 specification, use the **mdl** command in controller configuration mode. To remove the message, use the **no** form of this command.

mdl {**transmit** {**path** | **idle-signal** | **test-signal**} | **string** {**eic** | **lic** | **fic** | **unit** | **pfi** | **port** | **generator**} *string*}

no mdl {**transmit** {**path** | **idle-signal** | **test-signal**} | **string** {**eic** | **lic** | **fic** | **unit** | **pfi** | **port** | **generator**} *string*}

Syntax Description

transmit path	Enables transmission of the MDL Path message.
transmit idle-signal	Enables transmission of the MDL Idle Signal message.
transmit test-signal	Enables transmission of the MDL Test Signal message.
string eic *string*	Specifies the Equipment Identification Code; can be up to 10 characters.
string lic *string*	Specifies the Location Identification Code; can be up to 11 characters.
string fic *string*	Specifies the Frame Identification Code; can be up to 10 characters.
string unit *string*	Specifies the Unit Identification Code; can be up to 6 characters.
string pfi *string*	Specifies the Path Facility Identification Code sent in the MDL Path message; can be up to 38 characters.
string port *string*	Specifies the Port number string sent in the MDL Idle Signal message; can be up to 38 characters.
string generator *string*	Specifies the Generator number string sent in the MDL Test Signal message; can be up to 38 characters.

Defaults

No MDL message is configured.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.
12.2(11)YT	This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

Usage Guidelines

Use the **show controllers t3** command to display MDL information (received strings). MDL information is displayed only when framing is set to C-bit.

Note MDL is supported only when the DS3 framing is C-bit parity.

Examples

The following example shows the **mdl** commands on a T3 controller in slot 1, port 0:

```
Router(config)# controller t3 1/0
Router(config-controller)# clock source line
Router(config-controller)# mdl string eic ID
Router(config-controller)# mdl string fic Building B
Router(config-controller)# mdl string unit ABC
Router(config-controller)# mdl string pfi Facility Z
Router(config-controller)# mdl string port Port 7
Router(config-controller)# mdl transmit path
Router(config-controller)# mdl transmit idle-signal
```

Related Commands

Command	Description
show controllers t3	Displays information about T3 controllers.

media-type

To specify the physical connection on an interface, use the **media-type** command in interface configuration mode. To restore the default value, use the **no** form of this command.

media-type {**aui** | **10baset** | **100baset** | **mii**}

no media-type {**aui** | **10baset** | **100baset** | **mii**}

Syntax Description

aui	Selects an AUI 15-pin physical connection. This is the default on Cisco 4000 series routers.
10baset	Selects an R-J45 10BASE-T physical connection.
100baset	Specifies an RJ-45 100BASE-T physical connection. This is the default on Cisco 7000 series and Cisco 7200 series routers.
mii	Specifies a media-independent interface.

Defaults

An AUI 15-pin physical connection is the default setting on Cisco 4000 series routers.
A 100BASE-T physical connection is the default setting on Cisco 7000 series and Cisco 7200 series routers.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

To specify the physical connection on an interface, use the following interface configuration:

- Ethernet network interface module configuration on Cisco 4000 series routers
- Fast Ethernet Interface Processor (FEIP) on Cisco 7000 series, 7200 series, and 7500 series routers
- Full-duplex or half-duplex mode on a serial interface

Examples

The following example selects an RJ-45 10BASE-T physical connection on Ethernet interface 1:

```
Router(config)# interface ethernet 1
Router(config-if)# media-type 10baset
```

The following example specifies a media-independent interface physical connection to Fast Ethernet slot 0, port 1 on the Cisco 7000 or Cisco 7200 series:

```
Router(config)# interface fastethernet 0/1
Router(config-if)# media-type mii
```

The following example specifies a media-independent interface physical connection to Fast Ethernet slot 0, port adapter 1, port 1 on the Cisco 7500 series:

```
Router(config)# interface fastethernet 0/1/1
Router(config-if)# media-type mii
```

microcode reload controller

To reload the firmware and field programmable gate array (FPGA) without reloading the Cisco IOS image, use the **microcode reload controller** command in privileged EXEC mode.

microcode reload controller j1 *slot/port*

Syntax Description

j1	J1 controller.
slot/port	Backplane slot number and port number on the controller.

Defaults

No microcode reload activity is initiated.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(2)XH	This command was introduced.
12.1(3)T	This command was integrated into Cisco IOS Release 12.1(3)T.
12.2(8)T	The **j1** keyword was added.

Usage Guidelines

Configurations such as loopbacks in the running configuration are restored after this command is entered. If the controller is in a looped state before this command is issued, the looped condition is dropped. You have to re-initiate the loopbacks from the remote end by doing **no loop** from the controller configuration.

Examples

The following example show how to start the microcode reload activity:

```
Router# microcode reload controller j1 3/0

TDM-connections and network traffic will be briefly disrupted.
Proceed with reload microcode?[confirm]
Router#
*Mar  3 209.165.200.225: clk_src_link_up_down: Status of this CLK does not matter

*Mar  3 209.165.200.226: clk_src_link_up_down: Status of this CLK does not matter

*Mar  3 209.165.200.227: %CONTROLLER-5-UPDOWN: Controller J1 3/0, changed state to)
*Mar  3 209.165.200.227: clk_src_link_up_down: Status of this CLK does not matter

*Mar  3 209.165.200.228: clk_src_link_up_down: Status of this CLK does not matter

*Mar  3 209.165.200.229: %CONTROLLER-5-UPDOWN: Controller J1 3/0, changed state top
*Mar  3 209.165.200.229: clk_src_link_up_down: Status of this CLK does not matter

*Mar  3 209.165.200.229: clk_src_link_up_down: Status of this CLK does not matter
```

mode (ATM/T1/E1 controller)

To set the DSL controller into ATM mode and create an ATM interface or to set the T1 or E1 controller into T1 or E1 mode and create a logical T1/E1 controller, use the **mode** command in controller configuration mode. To disable the current mode and prepare to change modes, use the **no** form of this command.

Cisco 3700 Series, Cisco 2800 Series, Cisco 3800 Series

mode atm

no mode atm

Cisco 1700 Series, Cisco 2600XM Platform,

mode {**atm** | **t1** | **e1**}

no mode {**atm** | **t1** | **e1**}

Cisco IAD2430

mode {**atm** [**aim** *aim-slot*] | **cas** | **t1** | **e1**}

no mode {**atm** [**aim** *aim-slot*] | **cas** | **t1** | **e1**}

Syntax Description

atm	Sets the controller into ATM mode and creates an ATM interface (ATM 0). When ATM mode is enabled, no channel groups, DS0 groups, PRI groups, or time-division multiplexing (TDM) groups are allowed, because ATM occupies all the DS0s on the T1/E1 trunk. When you set the controller to ATM mode, the controller framing is automatically set to extended super frame (ESF) for T1 or cyclic redundancy check type 4 (CRC4) for E1. The line code is automatically set to binary 8-zero substitution (B8ZS) for T1 or high-density bipolar C (HDBC) for E1. When you remove ATM mode by entering the **no mode atm** command, ATM interface 0 is deleted. **Note** The **mode atm** command without the **aim** keyword uses software to perform ATM segmentation and reassembly (SAR). This is supported on Cisco 2600 series WIC slots only; it is not supported on network module slots.
aim	(Optional) The configuration on this controller uses the Advanced Integration Module (AIM) in the specified slot for ATM SAR. The **aim** keyword does not apply to the Cisco IAD2430 series IAD.
aim-slot	(Optional) AIM slot number on the router chassis: • Cisco 2600 series—0. • Cisco 3660—0 or 1.

cas	(Cisco 2600 series WIC slots only) Channel-associated signaling (CAS) mode. The T1 or E1 in this WIC slot is mapped to support T1 or E1 voice (that is, it is configured in a DS0 group or a PRI group). CAS mode is supported on both controller 0 and controller 1. On the Cisco IAD2430 series IAD, CAS mode is not supported.
t1	Sets the controller into T1 mode and creates a T1 interface. When you set the controller to T1 mode, the controller framing is automatically set to ESF for T1. The line code is automatically set to B8ZS for T1.
e1	Sets the controller into E1 mode and creates an E1 interface. When you set the controller to E1 mode, the controller framing is automatically set to CRC4 for E1. The line code is automatically set to HDB3 for E1.

Defaults

The controller mode is disabled.

Command Modes

Controller configuration

Command History

Release	Modification
11.3 MA	This command was introduced on the Cisco MC3810.
12.1(5)XM	Support for this command was extended to the merged SGCP/MGCP software.
12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T for the Cisco IAD2420 IADs.
12.2(2)XB	Support was extended to the Cisco 2600 series and Cisco 3660. The keyword **aim** and the argument *aim-slot* were added. The parenthetical modifier for the command was changed from "Voice over ATM" to "T1/E1 controller."
12.2(15)T	This command was implemented on the Cisco 2691 and the Cisco 3700 series.
12.3(4)XD	This command was integrated into Cisco IOS Release 12.3(4)XD on Cisco 2600 series and Cisco 3700 series routers to configure DSL Frame mode and to add T1/E1 Framed support.
12.3(4)XG	This command was integrated into Cisco IOS Release 12.3(4)XG on the Cisco 1700 series routers.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T on Cisco 2600 series and Cisco 3700 series routers.
12.3(11)T	This command was implemented on Cisco 2800 and Cisco 3800 series routers.

Usage Guidelines

When a DSL controller is configured in ATM mode, the mode must be configured identically on both the CO and CPE sides. Both sides must be set to ATM mode.

Note If using the **no mode atm** command to leave ATM mode, the router must be rebooted immediately to clear the mode.

When configuring a DSL controller in T1 or E1 mode, the mode must be configured identically on the CPE and CO sides.

Examples

ATM Mode Example

The following example configures ATM mode on the DSL controller.

```
Router(config)# controller dsl 3/0
Router(config-controller)# mode atm
```

T1 Mode Example

The following example configures T1 mode on the DSL controller.

```
Router(config)# controller dsl 3/0
Router(config-controller)# mode t1
```

Related Commands

Command	Description
channel-group	Configures a list of time slots for voice channels on controller T1 0 or E1 0.
tdm-group	Configures a list of time slots for creating clear channel groups (pass-through) for time-division multiplexing (TDM) cross-connect.

mode download

To enable operational code download mode for the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), use the **mode download** command in satellite initial configuration mode. To disable operational code download mode, use the **no** form of this command.

mode download

no mode download

Syntax Description

This command has no arguments or keywords.

Defaults

Operational code download mode is enabled.

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to disable operational code download mode:

```
Router(sat-init-config)# no mode download
```

mode (HSA redundancy)

To configure the redundancy mode, use the **mode** command in redundancy configuration mode. To configure the default redundancy mode, use the **no** form of this command.

mode {**hsa** | **rpr** | **rpr-plus**}

no mode {**hsa** | **rpr** | **rpr-plus**}

Syntax Description

hsa	Selects High System Availability (HSA) redundancy mode. This is the default.
rpr	Selects Route Processor Redundancy (RPR) mode.
rpr-plus	Selects RPR Plus (RPR+) redundancy mode.

Defaults

HSA redundancy mode

Command Modes

Redundancy configuration

Command History

Release	Modification
12.0(16)ST	This command was introduced.
12.0(19)ST1	The **rpr-plus** keyword was added.
12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

Usage Guidelines

The mode selected by the **mode** command in redundancy configuration mode must be fully supported by the image that has been installed in both the active and standby Route Switch Processors (RSPs). A high availability image must be installed in the RSPs before RPR+ can be configured. Use the **hw-module slot image** command to specify a high availability image to run on the standby RSP.

If the mode cannot be set on both RSPs, HSA is the default mode. A Cisco 7507 or Cisco 7513 router that has only one RSP installed operates in single Route Processor mode.

Examples

The following example enters redundancy configuration mode and sets RPR+ as the redundancy mode for a Cisco 7500 series router.

```
Router(config)# redundancy
Router(config-r)# mode rpr-plus
Router(config-r)# end
```

Related Commands

Command	Description
hw-module sec-cpu reset	Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image.
hw-module slot image	Specifies a high availability Cisco IOS image to run on an active or standby RSP.
redundancy	Enters redundancy configuration mode.
redundancy force-switchover	Switches control of a router from the active RSP to the standby RSP.
show redundancy	Displays the current redundancy mode.

mode (RSC redundancy)

To choose between classic-split mode (maximum throughput with no load sharing) and handover-split mode (maximum availability with load sharing), use the **mode** command in redundancy configuration mode. To reset to the default mode, use the **no** form of this command.

mode {**classic-split** | **handover-split**}

no mode

Syntax Description

classic-split	Nonredundant mode in which slots are split in a fixed 6/6 pattern between the two route-switch-controller (RSC) cards, and no handover occurs. This is the default.
handover-split	Redundant mode in which, if one RSC fails, the peer RSC takes over control of the failed RSC's resources (slots and cards).

Defaults

Classic-split mode

Command Modes

Redundancy configuration

Command History

Release	Modification
12.2(2)XB1	This command was introduced.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines

You must be connected to an RSC card on your Cisco AS5850 to use this command.

Examples

The following example selects handover-split mode:

```
Router(config)# redundancy
Router(config-r)# mode handover-split
```

Related Commands

Command	Description
show chassis	Displays, for a router with two RSCs, information about mode (handover-split or classic-split), RSC configuration, and slot ownership.
show chassis clocks	Displays all configured clock sources, even those from non-owned cards. This is because only one RSC can provide the master clock, and it may need to have backup clock sources configured from all cards present, regardless of ownership.
show context	Displays information about specified slots.
show redundancy debug-log	Displays up to 256 redundancy-related debug entries.

mode (T1/E1 controller)

To set the T1 or E1 controller into asynchronous transfer mode (ATM) and create an ATM interface, to set the T1 or E1 controller into T1 or E1 mode and create a logical T1 or E1 controller, or to set the T1 or E1 controller into channel-associated signaling (CAS) mode, use the **mode** command in controller configuration mode. To disable the current mode and prepare to change modes, use the **no** form of this command.

mode {**atm** [**aim** *aim-slot*] | **cas** | **t1** | **e1**}

no mode {**atm** [**aim** *aim-slot*] | **cas** | **t1** | **e1**}

Syntax Description

atm	Sets the controller into ATM mode and creates an ATM interface (ATM 0). When ATM mode is enabled, no channel groups, DS0 groups, PRI groups, or time-division multiplexing (TDM) groups are allowed, because ATM occupies all the DS0s on the T1/E1 trunk. When you set the controller to ATM mode, the controller framing is automatically set to extended super frame (ESF) for T1 or cyclic redundancy check type 4 (CRC4) for E1. The line code is automatically set to binary 8-zero substitution (B8ZS) for T1 or high-density binary 3 (HDB3) for E1. When you remove ATM mode by entering the **no mode atm** command, ATM interface 0 is deleted. **Note** The **mode atm** command without the **aim** keyword uses software to perform ATM segmentation and reassembly (SAR). This is supported on Cisco 2600 series WIC slots only and is not supported on network module slots.
aim	(Optional) The configuration on this controller uses the Advanced Integration Module (AIM) in the specified slot for ATM SAR. The **aim** keyword does not apply to the Cisco IAD2420 series IAD.
aim-slot	(Optional) AIM slot number on the router chassis. For the Cisco 2600 series, the AIM slot number is 0; for the Cisco 3660, the AIM slot number is 0 or 1.
cas	(CAS mode on Cisco 2600 series WIC slots only) The T1 or E1 in this WIC slot is mapped to support T1 or E1 voice (it is configured in a DS0 group or a PRI group). CAS mode is supported on both controller 0 and controller 1.
t1	(Cisco 2600XM series using the G.SHDSL WIC only) Sets the controller into T1 mode and creates a T1 interface. When you set the controller to T1 mode, the controller framing is automatically set to ESF for T1. The line code is automatically set to B8ZS for T1.
e1	(Cisco 2600XM series using the G.SHDSL WIC only) Sets the controller into E1 mode and creates an E1 interface. When you set the controller to E1 mode, the controller framing is automatically set to CRC4 for E1. The line code is automatically set to HDB3 for E1.

Defaults No controller mode is configured.

Command Modes Controller configuration

Command History

Release	Modification
11.3 MA	This command was introduced on the Cisco MC3810.
12.1(5)XM	Support for this command was extended to Simple Gateway Control Protocol (SGCP) and Media Gateway Control Protocol (MGCP).
12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T and implemented on the Cisco 7200 series.
12.2(2)XB	Support was extended to the Cisco 2600 series and Cisco 3660. The **aim** keyword and the *aim-slot* argument were added. The parenthetical modifier for the command was changed from "Voice over ATM" to "T1/E1 controller."
12.2(8)T	This command was implemented on the Cisco IAD2420 series.
12.2(11)T	This command was implemented on the Cisco AS5300 and Cisco AS5850.
12.2(15)T	This command was implemented on the Cisco 2691 and the Cisco 3700 series.
12.3(4)XD	Support was extended on Cisco 2600 series and Cisco 3700 series routers to configure DSL Frame mode and to add T1/E1 Framed support.
12.3(7)T	The support that was added in Cisco IOS Release 12.3(4)XD was integrated into Cisco IOS Release 12.3(7)T.

Usage Guidelines This command has the following platform-specific usage guidelines:

Cisco 2600 Series, Cisco 3660 Routers, or Cisco 3700 Series Rotuers That Use AIM for ATM Processing

You must use the **mode atm aim** *aim-slot* command.

Cisco 2600 Series Routers: For AIM for DSP Processing and That Specify DS0 Groups

You must use the **mode cas** command if using WIC slots for voice. This command does not apply if network modules are being used.

Cisco 3660 Routers or Cisco 3700 Series That Use an AIM Only for DSP Resources

Do not use this command.

On Cisco 2600 Series Routers That Use WIC Slots for Voice

The **mode atm** command without the **aim** keyword specifies software ATM segmentation and reassembly. When the **aim** keyword is used with the **mode atm** command, the AIM performs ATM segmentation and reassembly.

On Cisco 2600 Series and Cisco 3700 Series Routers That Configure a DSL Controller in ATM Mode,

The mode must be set to the same mode on both the CO and CPE sides. Both sides must be set to ATM mode.

If the **no mode atm** command is used to leave ATM mode, the router must be rebooted immediately to clear the mode.

On Cisco 2600 Series and Cisco 3700 Series RoutersWith a DSL Controller in T1 or E1 Mode

The mode must be configured identically on the CO and CPE sides.

Examples

ATM Mode for Voice Over ATM

The following example configures ATM mode on controller T1 0. This step is required for Voice over ATM.

```
Router(config)# controller t1 0
Router(config-controller)# mode atm
```

ATM Mode on Cisco 2600 Series Router with AIM

The following example configures ATM mode on controller T1 1/ 0 on a Cisco 2600 series router using an AIM in slot 0 for ATM segmentation and reassembly:

```
Router(config)# controller t1 1/0
Router(config-controller)# mode atm aim 0
```

ATM Mode on DSL Controller

The following example configures ATM mode on the DSL controller.

```
Router(config)# controller dsl 3/0
Router(config-controller)# mode atm
```

CAS Mode on T1 Controller

The following example configures CAS mode on controller T1 1 on a Cisco 2600 series router:

```
Router(config)# controller t1 1
Router(config-controller)# mode cas
```

T1 Mode on DSL Controller

The following example configures T1 mode on the DSL controller.

```
Router(config)# controller dsl 3/0
Router(config-controller)# mode t1
```

Related Commands

Command	Description
channel-group	Defines the time slots for voice channels on controller T1 0 or E1 0.
tdm-group	Configures a list of time slots for creating clear channel groups (pass-through) for TDM cross-connect.

mode two-way

To enable two-way operational mode for the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), use the **mode two-way** command in satellite initial configuration mode. To revert to one-way operational mode, use the **no** form of this command.

mode two-way

no mode two-way

Syntax Description

This command has no arguments or keywords.

Defaults

Two-way mode is enabled.

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to specify two-way operational mode:

```
Router(sat-init-config)# mode two-way
```

The following example shows how to specify one-way operational mode:

```
Router(sat-init-config)# no mode two-way
```

modem dtr-delay

To control the time that a data terminal ready (DTR) signal is held down when a line clears, use the **modem dtr-delay** command in line configuration mode. To restore the default hold down time, use the **no** form of this command.

modem dtr-delay *seconds*

no modem dtr-delay *seconds*

Syntax Description

seconds	Number of seconds. The default is 5.

Defaults

The default DTR signal hold down time is 5 seconds.

Command Modes

Line configuration

Command History

Release	Modification
12.1	This command was introduced.

Usage Guidelines

Use this command to reduce the time that a DTR signal is held down after an asynchronous line clears and before the DTR signal is raised again to accept new calls. Incoming calls may be rejected in heavily loaded systems even when modems are unused because the default DTR hold down interval may be too long. The **modem dtr-delay** command is designed for lines used for an unframed asynchronous session such as Telnet. Lines used for a framed asynchronous session such as PPP should use the **pulse-time** interface command.

Examples

The following example shows how to specify a DTR hold down interval of 2 seconds:

```
Router(config)# line 7
Router(config-line)# modem dtr-delay 2
```

Related Commands

Command	Description
pulse-time	Enables pulsing DTR signal intervals on serial interfaces.

mop enabled

To enable an interface to support the Maintenance Operation Protocol (MOP), use the **mop enabled** command in interface configuration mode. To disable MOP on an interface, use the **no** form of this command.

mop enabled

no mop enabled

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled on Ethernet interfaces and disabled on all other interfaces.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Examples

The following example enables MOP for serial interface 0:

```
Router(config)# interface serial 0
Router(config-if)# mop enabled
```

Related Commands

Command	Description
mop retransmit-timer	Configures the length of time that the Cisco IOS software waits before sending boot requests again to a MOP server.
mop retries	Configures the number of times the Cisco IOS software will send boot requests again to a MOP server.
mop sysid	Enables an interface to send out periodic MOP system identification messages.

mop sysid

To enable an interface to send out periodic Maintenance Operation Protocol (MOP) system identification messages, use the **mop sysid** command in interface configuration mode. To disable MOP message support on an interface, use the **no** form of this command.

mop sysid

no mop sysid

Syntax Description

This command has no arguments or keywords.

Defaults

Enabled

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

You can still run MOP without having the background system ID messages sent. This command lets you use the MOP remote console, but does not generate messages used by the configurator.

Examples

The following example enables serial interface 0 to send MOP system identification messages:

```
Router(config)# interface serial 0
Router(config-if)# mop sysid
```

Related Commands

Command	Description
mop device-code	Identifies the type of device sending MOP sysid messages and request program messages.
mop enabled	Enables an interface to support the MOP.

mtu

To adjust the maximum packet size or maximum transmission unit (MTU) size, use the **mtu** command in interface configuration mode. To restore the MTU value to its original default value, use the **no** form of this command.

mtu *bytes*

no mtu

Syntax Description

bytes	MTU size, in bytes.

Defaults

Table 12 lists default MTU values according to media type.

Table 12 Default Media MTU Values

Media Type	Default MTU (Bytes)
Ethernet	1500
Serial	1500
Token Ring	4464
ATM	4470
FDDI	4470
HSSI (HSA)	4470

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

Each interface has a default maximum packet size or MTU size. This number generally defaults to the largest size possible for that interface type. On serial interfaces, the MTU size varies, but cannot be set smaller than 64 bytes.

Note Changing an MTU size on a Cisco 7500 series router results in the recarving of buffers and resetting of all interfaces. The following message is displayed:

```
%RSP-3-Restart:cbus complex.
```

Protocol-Specific Versions of the mtu Command

Changing the MTU value with the **mtu** interface configuration command can affect values for the protocol-specific versions of the command (the **ip mtu** command, for example). If the value specified with the **ip mtu** interface configuration command is the same as the value specified with the **mtu** interface configuration command, and you change the value for the **mtu** interface configuration command, the **ip mtu** value automatically matches the new **mtu** interface configuration command value. However, changing the values for the **ip mtu** configuration commands has no effect on the value for the **mtu** interface configuration command.

ATM and LANE Interfaces

ATM interfaces are not bound by what is configured on the major interface. By default, MTU on a subinterface is equal to the default MTU (4490); if a client is configured the default is 1500. MTU can be changed on subinterfaces, but it may result in recarving of buffers to accommodate the new maximum MTU on the interface.

Examples

The following example specifies an MTU of 1000 bytes:

```
Router(config)# interface serial 1
Router(config-if)# mtu 1000
```

Related Commands

Command	Description
encapsulation smds	Enables SMDS service on the desired interface.
ip mtu	Sets the MTU size of IP packets sent on an interface.

national bit (controller)

To set the E3 national bit in the G.751 frame used by the E3 controller, use the **national bit** command in controller configuration mode. To return to the default E3 controller national bit, use the **no** form of this command.

national bit {**0** | **1**}

no national bit

Syntax Description

0	Sets the E3 national bit in the G.751 frame to 0.
1	Sets the E3 national bit in the G.751 frame to 1. This is the default.

Defaults

The default value is 1.

Command Modes

Controller configuration

Command History

Release	Modification
11.1 CA	This command was introduced.
12.2(11)YT	This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

Usage Guidelines

When G.751 framing is used, bit 11 of the G.751 frame is reserved for national use and is set to 1 by default.

Configure national bit 1 only when required for interoperability with your telephone company.

To verify the national bit configured on the interface, use the **show controllers serial** EXEC command.

Examples

The following example sets the national bit to 1 on an E3 controller in slot 1, port 0:

```
Router(config)# controller e3 1/0
Router(config-controller)# national bit 1
```

Related Commands

show controllers serial	Displays information that is specific to the interface hardware.

national bit (interface)

To set the E3 national bit in the G.751 frame used by the PA-E3 port adapter, use the **national bit** command in interface configuration mode. To return to the default E3 interface national bit, use the **no** form of this command.

national bit {**0** | **1**}

no national bit

Syntax Description

0	Sets the E3 national bit in the G.751 frame to 0. This is the default.
1	Sets the E3 national bit in the G.751 frame to 1.

Defaults

The default value is 0.

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CA	This command was introduced.

Usage Guidelines

The **national bit** command sets bit 12 in the E3 frame.

To verify the national bit configured on the interface, use the **show controllers serial** EXEC command.

Examples

The following example sets the national bit to 1 on the PA-E3 port adapter in slot 1, port adapter slot 0, interface 0:

```
Router(config)# interface serial 1/0/0
Router(config-if)# national bit 1
```

Related Commands

Command	Description
international bit	Sets the E3 international bit in the G.751 frame used by the PA-E3 port adapter.
show controllers serial	Displays information that is specific to the interface hardware.

national reserve

To set the E1 national bit, use the **national reserve** command in interface configuration mode. To return to the default E1 national bit, use the **no** form of this command.

national reserve {**0** | **1**}{**0** | **1**}{**0** | **1**}{**0** | **1**}{**0** | **1**}{**0** | **1**}

no national reserve

Syntax Description

0	Sets any of the six required E1 national bits in the G.751 frame to 0.
1	Sets any of the six required E1 national bits in the G.751 frame to 1. This is the default.

Defaults

111111

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XE	This command was introduced.
12.0(7)XE1	This command was implemented on the Cisco 7100 series routers.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

This command applies only for E1. This command not only sets the national reserve bits but also sets the international bit as well. The far left digit represents the international bit. All six digits must be present for the pattern to be valid.

Examples

On Cisco 7100 series routers, the following example sets the E1 national bit on interface 1 on the port adapter in slot 0 to no scrambling:

```
Router(config)# interface atm 1/0
Router(config-if)# national reserve 011011
```

negotiation

To configure speed, duplex, and flow control on the Gigabit Ethernet port of the Cisco 7200-I/O-GE+E, use the **negotiation** command in interface configuration mode. To disable automatic negotiation, use the **no negotiation auto** command.

negotiation {**forced** | **auto**}

no negotiation auto

Syntax Description

forced	Disables flow control and configures the Gigabit Ethernet interface in 1000/full-duplex mode.
auto	Enables the autonegotiation protocol to configures the speed, duplex, and automatic flow control of the Gigabit Ethernet interface. This is the default.

Defaults

auto

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CC	This command was introduced.
12.0(7)S, 12.0(6)T	The **forced** keyword was added.
12.1(3a)E	This command was implemented on the Cisco 7200-I/O-GE+E controller.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

The **negotiation** command is applicable only to the Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E. The **negotiation auto** command is used instead of the **duplex** and **speed** commands (which are used on Ethernet and Fast Ethernet interfaces) to automatically configure the duplex and speed settings of the interfaces. The **negotiation forced** command is used to configure the Gigabit Ethernet interface to be 1000/full-duplex only and to disable flow control. The Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E is restricted to 1000 Mbps/full duplex only. Autonegotiation negotiates only to these values.

Examples

The following example configures the Gigabit Ethernet interface of the Cisco 7200-I/O-GE +E to autonegotiate:

```
Router(config)# interface gigabitethernet 0/0
Router(config-if)# negotiation auto
```

Related Commands

Command	Description
show interfaces gigabitethernet	Displays the status and configuration settings of the Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E.

nrzi-encoding

To enable nonreturn-to-zero inverted (NRZI) line-coding format, use the **nrzi-encoding** command in interface configuration mode. To disable this capability, use the **no** form of this command.

nrzi-encoding [**mark**]

no nrzi-encoding

Syntax Description

mark	(Optional) Specifies that NRZI mark encoding is required on the PA-8T and PA-4T+ synchronous serial port adapters on Cisco 7200 and Cisco 7500 series routers. If the **mark** keyword is not specified, NRZI space encoding is used.

Defaults

Disabled

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
11.3	The **mark** keyword was added for the Cisco 7200 series routers and Cisco 7500 series routers.

Usage Guidelines

All FSIP, PA-8T, and PA-4T+ interface types support nonreturn-to-zero (NRZ) and NRZI format. This is a line-coding format that is required for serial connections in some environments. NRZ encoding is most common. NRZI encoding is used primarily with EIA/TIA-232 connections in IBM environments.

Examples

The following example configures serial interface 1 for NRZI encoding:

```
Router(config)# interface serial 1
Router(config-if)# nrzi-encoding
```

The following example configures serial interface 3/1/0 for NRZI mark encoding:

```
Router(config)# interface serial 3/1/0
Router(config-if)# nrzi-encoding mark
```

outbound data-pid

Note Effective with Cisco IOS Release 12.4(2)T, this command is superseded by the **outbound pid management** command. The **outbound data-pid** command is still available, but use of the **outbound pid management** command is recommended.

To specify the outbound data packet identification (PID) number, use the **outbound data-pid** command in satellite initial configuration mode. To remove the PID number configuration, use the **no** form of this command.

outbound data-pid *number*

no outbound data-pid

Syntax Description

number	Packet identification (PID) number in the range from 1 to 8190.

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.
12.4(2)T	This command was superseded by the **outbound pid management** command.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to specify the outbound data PID number:

```
Router(sat-init-config)# outbound data-pid 3000
```

outbound data-rate

To specify the VSAT data rate, use the **outbound data-rate** command in satellite initial configuration mode. To remove the data rate configuration, use the **no** form of this command.

outbound data-rate *rate*

no outbound data-rate

Syntax Description

rate	VSAT data rate in the range from 250000 to 73000000 bits per second.

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to specify the VSAT data rate:

```
Router(sat-init-config)# outbound data-rate 450000
```

outbound frequency

To specify the VSAT outbound frequency, use the **outbound frequency** command in satellite initial configuration mode. To remove the outbound frequency configuration, use the **no** form of this command.

outbound frequency *frequency*

no outbound frequency

Syntax Description

frequency	VSAT outbound frequency in the range from 950000 to 2150000 kilohertz.

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to configure the VSAT outbound frequency:

```
Router(sat-init-config)# outbound frequency 950000
```

outbound id

To specify the VSAT outbound ID, use the **outbound id** command in satellite initial configuration mode. To remove the outbound ID configuration, use the **no** form of this command.

outbound id *number*

no outbound id

Syntax Description

number	ID number in the range from 0 to 255.

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to configure the VSAT outbound ID:

```
Router(sat-init-config)# outbound id 95
```

outbound modulation-type

To specify the VSAT modulation type, use the **outbound modulation-type** command in satellite initial configuration mode. To remove the VSAT modulation type configuration, use the **no** form of this command.

outbound modulation-type {**DVB** | **TURBO_QPSK** | **8PSK**}

no outbound modulation-type

Syntax Description

DVB	Digital Video Broadcasting for satellite.
TURBO_QPSK	Turbo-coded quadrature Phase Shift Keying.
8PSK	Phase Shift Keying.

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to configure the VSAT modulation type:

```
Router(sat-init-config)# outbound modulation-type DVB
```

outbound sync ip address

To specify the outbound synchronization IP address, use the **outbound sync ip address** command in satellite initial configuration mode. To remove the outbound synchronization IP address configuration, use the **no** form of this command.

outbound sync ip address *address*

no outbound sync ip address

Syntax Description

address	Outbound synchronization IP address.

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to configure the outbound synchronization IP address:

```
Router(sat-init-config)# outbound sync ip address 10.2.2.2
```

outbound viterbi-rate

To specify the VSAT Viterbi code rate, use the **outbound viterbi-rate** command in satellite initial configuration mode. To return to the default rate, use the **no** form of this command.

outbound viterbi-rate *rate*

no outbound viterbi-rate

Syntax Description

rate	Viterbi code rate. It can be one of the following values: • **1/2** • **1/4** • **2/3** • **3/4** • **3/4(2.05)** • **3/4(2.1)** • **3/4(2.6)** • **5/6** • **6/7** • **7/8** • **8/9**

Defaults

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

Examples

The following example shows how to configure the VSAT Viterbi code rate:

```
Router(sat-init-config)# outbound viterbi-rate 3/4(2.6)
```

overhead j0

To specify the Regenerator Section (RS) Trace identifier (J0), use the **overhead j0** command in controller configuration mode. To restore the default value, use the **no** form of this command.

overhead j0 {**transmit** | **receive**} *string*

no overhead j0 {**transmit** | **receive**} *string*

Syntax Description

transmit	Specifies that the *string* argument is sent on the transmit line.
receive	Specifies that the configured *string* argument is matched with the string received from a peer.
string	Value in the range from 0 to 255 that is converted into character format and embedded in a 16-byte frame. The default is 1.

Defaults

The default value is 1, and no peer authentication is performed.

Command Modes

Controller configuration

Command History

Release	Modification
12.0(17)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T, and the **transmit** and **receive** keywords were added.

Usage Guidelines

RS trace is a maintenance feature of SONET. One byte (J0) of the Section overhead associated with each SONET frame is used to carry information identifying the transmitting equipment.

Use this command for peer authentication and continuity testing between two STM-1 optical peers. If the authentication string sent by the originating peer does not match the configured string on the receiving peer, the SONET controller will not come up on the receiving peer. Alarm logs on the originating peer will show that it has RS-Trace Identifier Mismatch (RS-TIM).

Examples

The following example shows how to configure J0 overhead in both the transmit and receive directions on a STM-1 trunk card:

```
Router(config)# controller sonet 2/0
Router(config-controller)# overhead j0 transmit 22
Router(config-controller)# overhead j0 receive 34
```

The following example shows how to set the RS Trace identifier to 82:

```
Router(config-controller)# overhead j0 transmit 82
```

overhead j1

To configure the message length and the message text of the High Order Path Trace identifier (J1), use the **overhead j1** command in controller configuration or path configuration mode. To restore the default value, use the **no** form of this command.

overhead j1 length {**16** | **64**} {**transmit-message** | **receive-message**} *string*

no overhead j1 length {**16** | **64**} {**transmit-message** | **receive-message**} *string*

Syntax Description

length	Specifies the length of the authentication *string* argument.
16	Specifies that the length of the authentication *string* is 16 characters. The STM-1 trunk card supports a string length of 16.
64	Specifies that the length of the authentication *string* is 64 characters.
transmit-message	Specifies that the *string* argument is sent on the transmit line.
receive-message	Specifies that the configured *string* argument is matched with the string received from a peer.
string	Combination of characters and numbers for the specified **length** value.

Defaults

The default message length is 16 for SDH framing and 64 for SONET framing.
No peer authentication is performed.

Command Modes

SDH Framing with AU-4 Mapping

Controller configuration

SDH Framing with AU-3 Mapping, or SONET Framing

Path configuration

Command History

Release	Modification
12.0(17)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T, and the **transmit-message** and **receive-message** keywords were added.

Usage Guidelines

Path trace is a maintenance feature of SONET/SDH. One byte (J1) of the Path overhead associated with each path in the SONET/SDH frame is used to carry information identifying the originating Path Terminating Equipment (PTE).

Where you configure the Path Trace identifier depends on the framing (SDH or SONET) and the AUG mapping. In SDH with AU-4 mapping, the Path Trace identifier is configured at the SONET controller level. In SDH with AU-3 mapping or in SONET framing, the Path Trace identifier is configured at the path level.

In accordance with SONET and SDH standard requirements, the Path Trace message you enter is manipulated as follows:

- If you select a message length of 16, the actual message length can be up to 15 characters. An additional byte, prepended to the message, contains the result of a CRC7 calculated on the message. If the actual message text is fewer than 15 characters, the message text is padded to its full length with NULL characters.
- If you select a message length of 64 and the actual message text is fewer than 62 characters, the message text is padded with NULL characters. The last two byte positions, 63 and 64, are always CR/LF (0x0D/0x0A).

Use this command for peer authentication and continuity testing between two STM-1 optical peers. If the authentication string sent by the originating peer does not match the configured string on the receiving peer, the Path (and all E1 controllers within the path) will not come up on the receiving peer. Alarm logs on the originating peer will show that it has High Order Path-Trace Identifier Mismatch (HP-TIM).

Examples

The following example shows J1 configuration in SDH framing with AU-4 AUG mapping. The **overhead j1** command sets the message length to 16, and specifies the message text as metro_SF:

```
Router(config-controller)# au-4 1
Router(config-ctrlr-au4)# overhead j1 length 16 transmit-message metro_SF
```

The following example shows J1 configuration in SDH framing with AU-3 AUG mapping. The **overhead j1** command sets the message length to 16, and specifies the message text as metro_LA:

```
Router(config)# controller sonet 4/0
Router(config-controller)# au-3 3
Router(config-ctrlr-au3)# overhead j1 length 16 receive-message metro_L
```

The following example shows J1 configuration in SONET framing in STS-1 mode. The **overhead j1** command sets the message length to 64, and specifies the message text:

```
Router(config)# controller sonet 4/0
Router(config-controller)# sts-1 3
Router(config-ctrlr-sts1)# overhead j1 length 64 transmit-message metro_washington
gsr_0057/4/3
```

The following example shows how to configure j1 overhead in both the transmit and receive directions:

```
Router(config)# controller sonet 2/0
Router(config-controller)# overhead j1 length 2 transmit-message 22
Router(config-controller)# overhead j1 length 2 receive-message 34
```

payload-compression

To enable payload compression, use the **payload-compression** command in CEM configuration mode. To disable payload compression, use the **no** form of this command.

payload-compression

no **payload-compression**

Syntax Description

This command has no arguments or keywords.

Defaults

Payload compression is disabled.

Command Modes

CEM configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.

Usage Guidelines

Payload compression can be enabled only for a maximum of 3 Mbps per network module.

Examples

The following example demonstrates how to enable payload compression.

```
Router(config-cem)# payload-compression
```

Related Commands

Command	Description
cem	Enters circuit emulation configuration mode.
payload-size	Configures payload size.
show cem	Displays CEM statistics.

payload-size

To configure the payload size of a circuit emulation (CEM) over IP (CEoIP) packet, use the **payload-size** command in CEM configuration mode. To restore the default payload size, use the **no** form of this command.

payload-size *size*

no payload-size

Syntax Description

size	Integer that defines the number of bytes per CEoIP packet. Range is from 1 to 1312. The maximum configurable payload size is as follows: • 1312 bytes if data protection is not enabled • 656 bytes if data protection is enabled The minimum configurable payload size for an unframed T1 or E1 channel is 256 bytes. The minimum configurable payload size for a framed T1 or E1 channel is as follows: • 56 bytes if the data rate is less than or equal to 256,000 kbps • 128 bytes if the data rate is greater than 256,000 kbps and less than or equal to 512,000 kbps • 256 bytes if the data rate is greater than 512,000 kbps The minimum configurable payload size for a serial channel is as follows: • 1 byte if the data rate is less than or equal to 2400 kbps • 4 bytes if the data rate is greater than 2400 kbps but less than or equal to 9600 kbps • 16 bytes if the data rate is greater than 9600 kbps but less than or equal to 32,000 kbps • 32 bytes if the data rate is greater than 32,000 kbps but less than or equal to 64,000 kbps • 64 bytes if the data rate is greater than 64,000 kbps but less than or equal to 256,000 kbps • 128 bytes if the data rate is greater than 256,000 kbps but less than or equal to 512,000 kbps • 256 bytes if the data rate is greater than 512,000 kbps **Note** For T1 and E1, the integer must be a multiple of the number of time slots and 16.

Defaults

The default payload size for a serial channel is 32 bytes. Defaults for T1 and E1 channels are shown in Table 13 and Table 14.

*Table 13 Default Payload Size for N*64 kbps T1/E1 Channels*

Number of Time Slots	Channel Data Rate (kbps)	Default Payload Size (bytes)
1	64	64
2	128	64
3	192	96
4	256	64
5	320	160
6	384	144
7	448	224
8	512	128
9	576	288
10	640	320
11	704	352
12	768	288
13	832	416
14	896	336
15	960	480
16	1024	256
Unframed T1	1544	512
Unframed E1	2048	512
17	1088	544
18	1152	576
19	1216	608
20	1280	560
21	1344	672
22	1408	528
23	1472	736
24	1536	528
25	1600	800
26	1664	624
27	1728	864
28	1792	560
29	1856	928
30	1920	720
31	1984	992

*Table 14 Default Payload Size for N*56 kbps T1 Channels*

Number of Time Slots	Channel Data Rate (kbps)	Default Payload Size (bytes)
1	56	56
2	112	56
3	168	168
4	224	56
5	280	280
6	336	168
7	392	168
8	448	168
9	504	504
10	560	280
11	616	616
12	672	336
13	728	728
14	784	280
15	840	840
16	896	336
17	952	952
18	1008	1008
19	1064	1064
20	1120	560
21	1176	672
22	1232	616
23	1288	1288
24	1344	672

Command Modes

CEM configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.

Usage Guidelines

Use this command to configure the size of each CEoIP packet. Smaller sizes reduce delay but diminish efficiency.

Note The payload size must be a multiple of the number of time slots and 16. The payload size entered by the user will be automatically changed to match the above requirement, and a console message will inform the user of this change.

Examples

The following example demonstrates how to configure a payload size of 224.

```
Router(config-cem)# payload-size 224
```

Related Commands

Command	Description
cem	Enters circuit emulation configuration mode.
payload-compression	Enables payload compression.
show cem	Displays CEM channel statistics.

physical-layer

To specify the mode of a slow-speed serial interface on a router as either synchronous or asynchronous, use the **physical-layer** command in interface configuration mode. To return the interface to the default mode of synchronous, use the **no** form of this command.

physical-layer {**sync** | **async**}

no physical-layer

Syntax Description

sync	Places the interface in synchronous mode. This is the default.
async	Places the interface in asynchronous mode.

Defaults

Synchronous mode

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command applies only to low-speed serial interfaces available on Cisco 2520 through Cisco 2523 series routers.

In synchronous mode, low-speed serial interfaces support all interface configuration commands available for high-speed serial interfaces, except the following two commands:

- **half-duplex timer cts-delay**
- **half-duplex timer rts-timeout**

When placed in asynchronous mode, low-speed serial interfaces support all commands available for standard asynchronous interfaces.

When you enter this command, it does not appear in the output of **more system:running-config** and **more nvram:startup-config** commands because the command is a physical-layer command.

Examples

The following example shows how to change a low-speed serial interface from synchronous to asynchronous mode:

```
Router(config)# interface serial 2
Router(config-if)# physical-layer async
```

Related Commands

Command	Description
more	Displays a specified file.

port (interface)

To enable an interface on a PA-4R-DTR port adapter to operate as a concentrator port, use the **port** command in interface configuration mode. To restore the default station mode, use the **no** form of this command.

port

no port

Syntax Description

This command has no arguments or keywords.

Defaults

Station mode

Command Modes

Interface configuration

Command History

Release	Modification
11.3(3)T	This command was introduced.

Usage Guidelines

By default, the interfaces of the PA-4R-DTR operate as Token Ring stations. Station mode is the typical operating mode. Use this command to enable an interface to operate as a concentrator port.

Examples

The following example configures the PA-4R-DTR ports to operate in concentrator mode on a Cisco 7000 series router:

```
Router(config)# interface tokenring 3/0/0
Router(config-if)# port
```

pos ais-shut

To send the line alarm indication signal (LAIS) when the Packet-over-SONET (POS) interface is placed in any administrative shutdown state, use the **pos ais-shut** command in interface configuration mode.

pos ais-shut

Syntax Description

This command has no arguments or keywords.

Defaults

No LAIS is sent.

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CC	This command was introduced.

Usage Guidelines

In Automatic Protection Switching (APS) environments, LAIS can be used to force a protection switch. This command forces an APS switch when the interface is placed in the administrative shutdown state.

For more information on APS, refer to the "Configuring Serial Interfaces" chapter in the *Cisco IOS Interface and Hardware Component Configuration Guide*.

This command does not have a **no** form.

Examples

The following example forces the alarm indication on POS OC-3 interface 0 in slot 3:

```
Router(config)# interface pos 3/0
Router(config-if)# shutdown
Router(config-if)# pos ais-shut
```

pos flag

To set the SONET overhead bytes in the frame header to meet a specific standards requirement or to ensure interoperability with the equipment of another vendor, use the **pos flag** command in interface configuration mode. To remove the setting of the SONET overhead bytes, use the **no** form of this command.

pos flag {**c2** | **j0** | **s1s0**} *value*

no pos flag {**c2** | **j0** | **s1s0**} *value*

Syntax Description

c2 *value*	Path signal identifier used to identify the payload content type. The default value is 0xCF.
j0 *value*	Section trace byte (formerly the C1 byte). For interoperability with Synchronous Digital Hierarchy (SDH) equipment in Japan, use the value 0x1. The byte value can be 0 to 255.
sls0 *value*	S1 and S0 bits (bits 5 and 6 of the H1 #1 payload pointer byte). Use the following values to tell the SONET transmission equipment the SS bit: • For OC-3c, use 0 (this is the default). • For AU-4 container in SDH, use 2. The S1 and S0 bits can be 0 to 3. Values 1 and 3 are undefined. The default value is 0.

Defaults

The default **c2** value is 0xCF.
The default **sls0** value is 0.

Command Modes

Interface configuration

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12000 series Internet routers.

Usage Guidelines

Use the following values to tell the SONET transmission equipment the payload type:

- For PPP, or High-Level Data Link Control (HDLC) when required, use 0xCF (this is the default).
- For ATM, use 0x13.
- For other equipment, use any nonzero value.
- The byte value can be 0 to 255.

Examples

The following example sets the path signal identifier used to identify the payload content type to ATM on the **pos** interface in slot 9:

```
Router(config)# interface pos 9/0
Router(config-if)# pos flag c2 0x13
Router(config-if)# end
```

pos framing

To specify the framing used on the POS (Packet-over-SONET) interface, use the **pos framing** command in interface configuration mode. To return to the default SONET STS-3c framing mode, use the **no** form of this command.

pos framing {**sdh** | **sonet**}

no pos framing

Syntax Description

sdh	Selects SDH STM-1 framing. This framing mode is typically used in Europe.
sonet	Selects SONET STS-3c framing. This is the default.

Defaults

SONET STS-3c framing

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.
11.3	This command was modified to change the **posi framing-sdh** command to **pos framing-sdh**.
11.2 GS	The command syntax was changed from **pos framing-sdh** to **pos framing**. The **sonet** keyword was added.

Examples

The following example configures the interface for SDH STM-1 framing:

```
Router(config)# interface pos 3/0
Router(config-if)# pos framing sdh
Router(config-if)# no shutdown
```

Related Commands

Command	Description
clock source (interface)	Controls the clock used by a G.703-E1 interface.
interface	Configures an interface type, and enters interface configuration mode.

pos report

To permit selected SONET alarms to be logged to the console for a POS (Packet-over-SONET) interface, use the **pos report** command in interface configuration mode. To disable logging of select SONET alarms, use the **no** form of this command.

pos report {**b1-tca** | **b2-tca** | **b3-tca** | **lais** | **lrdi** | **pais** | **plop** | **prdi** | **rdool** | **sd-ber** | **sf-ber** | **slof** | **slos**}

no pos report {**b1-tca** | **b2-tca** | **b3-tca** | **lais** | **lrdi** | **pais** | **plop** | **prdi** | **rdool** | **sd-ber** | **sf-ber** | **slof** | **slos**}

Syntax Description

b1-tca	Reports B1 bit-error rate (BER) threshold crossing alarm (TCA) errors.
b2-tca	Reports B2 BER crossing TCA errors.
b3-tca	Reports B3 BER crossing TCA errors.
lais	Reports line alarm indication signal errors.
lrdi	Reports line remote defect indication errors.
pais	Reports path alarm indication signal errors.
plop	Reports path loss of pointer errors.
prdi	Reports path remote defect indication errors.
rdool	Reports receive data out of lock errors.
sd-ber	Reports signal degradation BER errors.
sf-ber	Reports signal failure BER errors.
slof	Reports section loss of frame errors.
slos	Reports section los of signal errors.

Defaults

The following alarms are reported by default:

- **b1-tca**
- **b2-tca**
- **b3-tca**
- **plop**
- **sf-ber**
- **slof**
- **slos**

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CC	This command was introduced.

Usage Guidelines

Reporting an alarm means that the alarm can be logged to the console. Just because an alarm is permitted to be logged does not guarantee that it is logged. SONET alarm hierarchy rules dictate that only the most severe alarm of an alarm group is reported. Whether an alarm is reported or not, you can view the current state of a defect by checking the "Active Defects" line from the **show controllers pos** command output. A defect is a problem indication that is a candidate for an alarm.

For B1, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section level bit errors have occurred.

For B2, the bit interleaved parity error report is calculated by comparing the BIP-8/24 code with the BIP-8 code extracted from the B2 byte of the following frame. Differences indicate that line level bit errors have occurred.

For B3, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B3 byte of the following frame. Differences indicate that path level bit errors have occurred.

PAIS is sent by line terminating equipment (LTE) to alert the downstream path terminating equipment (PTE) that it has detected a defect on its incoming line signal.

PLOP is reported as a result of an invalid pointer (H1, H2) or an excess number of new data flag (NDF) enabled indications.

SLOF is detected when a severely error framing (SEF) defect on the incoming SONET signal persists for 3 milliseconds.

SLOS is detected when an all-zeros pattern on the incoming SONET signal lasts 19 plus or minus 3 microseconds or longer. This defect might also be reported if the received signal level drops below the specified threshold.

To determine the alarms that are reported on the interface, use the **show controllers pos** command.

Examples

The following example enables reporting of SD-BER and LAIS alarms on the interface:

```
Router(config)# interface pos 3/0/0
Router(config-if)# pos report sd-ber
Router(config-if)# pos report lais
Router(config-if)# end
```

Related Commands

Command	Description
interface	Configures an interface type, and enters interface configuration mode.
show controllers pos	Displays information about the POS controllers.

pos scramble-atm

To enable SONET payload scrambling on a POS (Packet-over-SONET) interface, use the **pos scramble-atm** command in interface configuration mode. To disable scrambling, use the **no** form of this command.

pos scramble-atm

no pos scramble-atm

Syntax Description

This command has no arguments or keywords.

Defaults

Scrambling is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CA	This command was introduced.

Usage Guidelines

SONET payload scrambling applies a self-synchronous scrambler ($x^{43}+1$) to the Synchronous Payload Envelope (SPE) of the interface to ensure sufficient bit transition density. Both ends of the connection must use the same scrambling algorithm. When enabling POS scrambling on a VIP2 POSIP on the Cisco 7500 series router that has a hardware revision of 1.5 or higher, you can specify CRC 16 only (that is, CRC 32 is currently not supported).

To determine the hardware revision of the POSIP, use the **show diag** command.

To determine whether scrambling is enabled on the interface, use the **show interface pos** command or the **show running-config** command.

Note SONET payload scrambling is enabled with the **pos scramble-atm** command. SONET payload scrambling applies a self-synchronous scrambler ($x^{43}+1$) to the Synchronous Payload Envelope (SPE) of the interface to ensure sufficient bit transition density. Both sides of the connection must be configured using the **pos scramble-atm** command. Currently, when connecting to a Cisco 7500 series router and using the **pos scramble-atm** command, you must specify the **crc 16** command rather than the **crc 32** command.

Examples

The following example enables scrambling on the interface:

```
Router(config)# interface pos 3/0
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# end
```

Related Commands

Command	Description
crc	Sets the length of the CRC on an FSIP or HIP of the Cisco 7500 series routers or on a 4-port serial adapter of the Cisco 7200 series routers.
interface	Configures an interface type, and enters interface configuration mode.
show diag	Displays hardware information for the router.
show interfaces pos	Displays information about the Packet OC-3 interface in Cisco 7500 series routers.

pos threshold

To set the bit-error rate (BER) threshold values of the specified alarms for a POS (Packet-Over-SONET) interface, use the **pos threshold** command in interface configuration mode. To return to the default setting, use the **no** form of this command.

pos threshold {**b1-tca** | **b2-tca** | **b3-tca** | **sd-ber** | **sf-ber**} *rate*

no pos threshold {**b1-tca** | **b2-tca** | **b3-tca** | **sd-ber** | **sf-ber**} *rate*

Syntax Description

b1-tca	B1 BER threshold crossing alarm. The default rate is 6.
b2-tca	B2 BER threshold crossing alarm. The default rate is 6..
b3-tca	B3 BER threshold crossing alarm. The default rate is 6..
sd-ber	Signal degrade BER threshold. The default rate is 6..
sf-ber	Signal failure BER threshold. The default rate is 3 (10e-3).
rate	Bit-error rate from 3 to 9 (10-n).

Defaults

The default rate is 6 for **b1-tca**, **b2-tca**, **b3-tca**, and **sd-ber**.
The default rate is 3 (10e-3) for **sf-ber**.

Command Modes

Interface configuration

Command History

Release	Modification
11.1 CC	This command was introduced.

Usage Guidelines

For B1, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section level bit errors have occurred.

For B2, the bit interleaved parity error report is calculated by comparing the BIP-8/24 code with the BIP-8 code extracted from the B2 byte of the following frame. Differences indicate that line level bit errors have occurred.

For B3, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B3 byte of the following frame. Differences indicate that path level bit errors have occurred.

SF-BER and SD-BER are sourced from B2 BIP-8 error counts (as is B2-TCA). However, SF-BER and SD-BER feed into the automatic protection switching (APS) machine and can lead to a protection switch (if APS is configured).

B1-TCA, B2-TCA, and B3-TCA do nothing more than print a log message to the console (if reports for them are enabled).

To determine the BER thresholds configured on the interface, use the **show controllers pos** command.

Examples

The following example configures thresholds on the interface:

```
Router(config)# interface pos 3/0/0
Router(config-if)# pos threshold sd-ber 8
Router(config-if)# pos threshold sf-ber 4
Router(config-if)# pos threshold b1-tca 4
Router(config-if)# end
```

Related Commands

Command	Description
interface	Configures an interface type, and enters interface configuration mode.
pos report	Permits selected SONET alarms to be logged to the console for a POS interface.
show controllers pos	Displays information about the POS controllers.

power inline

To determine how inline power is applied to the device on the specified Fast Ethernet port, use the **power inline** command in interface configuration mode. To return the setting to its default, use the **no** form of this command.

power inline {**auto** | **never**}

no power inline

Syntax Description

auto	Automatically detects and powers inline devices. This is the default.
never	Never applies inline power.

Defaults

Power is applied when a telephone is detected on the port (auto).

Command Modes

Interface configuration

Command History

Release	Modification
12.0(5)XU	This command was first introduced.
12.2(2)XT	This command was integrated to support switchport creation on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T to support switchport creation.

Examples

The following example shows how to always apply power to the port:

```
Router(config-if)# power inline auto
```

Related Commands

Command	Description
show power inline	Displays the power status for the specified port or for all ports.
switchport priority extend	Determines how the telephone connected to the specified port handles priority traffic received on its incoming port.
switchport voice vlan	Configures the voice VLAN on the port.

pulse-time

To enable pulsing data terminal ready (DTR) signal intervals on the serial interfaces, use the **pulse-time** command in interface configuration mode. To restore the default interval, use the **no** form of this command.

pulse-time [**msec**] *seconds*

no pulse-time

Syntax Description

msec	(Optional) Specifies the use of milliseconds for the DTR signal interval.
seconds	Integer that specifies the DTR signal interval in seconds. If the **msec** keyword is configured, the DTR signal interval is specified in milliseconds. The default is 0.

Defaults

0 seconds

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
12.1(5)T	The optional **msec** keyword was added to configure the interval in milliseconds.

Usage Guidelines

When the serial line protocol goes down (for example, because of loss of synchronization), the interface hardware is reset and the DTR signal is held inactive for at least the specified interval. This function is useful for handling encrypting or other similar devices that use the toggling of the DTR signal to resynchronize.

Use the optional **msec** keyword to specify the DTR signal interval in milliseconds. A signal interval set to milliseconds is recommended on High-Speed Serial Interfaces (HSSIs).

Examples

The following example enables DTR pulse signals for 3 seconds on serial interface 2:

```
Router(config)# interface serial 2
Router(config-if)# pulse-time 3
```

The following example enables DTR pulse signals for 150 milliseconds on HSSI interface 2/1/0:

```
Router(config)# interface hssi 2/1/0
Router(config-if)# pulse-time msec 150
```

redundancy handover

To hand over control of resources (slots and cards) from a route-switch-controller (RSC) card to its peer RSC card, use the **redundancy handover** command in privileged EXEC mode.

redundancy handover {**cancel** | {**peer-resources** | **shelf-resources**}
[**busyout-period** *mins*] [**at** *hh*:*mm* [{*day month* | *month day*} *year*]]}

Syntax Description

cancel	Any pending handover is canceled.
peer-resources	Resources to be handed over are those on the side of the peer RSC. This parameter applies only when the system is in extraload.
shelf-resources	Resources to be handed over are those on the side of the RSC from which the command is run.
busyout-period *mins*	(Optional) Time period for which all slots in the selected resources are to be busied out before handover. If time options are omitted, handover or busyout period begins immediately.
at *hh*:*mm day month year*	(Optional) Time of the handover or start of the busyout period, in 24-hour time format; hour and minute are required; day, month, and year are optional.

Defaults

Control remains with the assigned RSC.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(2)XB1	This command was introduced.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.

Usage Guidelines

To use this command, you must have two RSC cards installed on your Cisco AS5850 and you must be connected to one of them in handover-split mode. This command can be run from either RSC and can specify that slots be handed over to the peer RSC.

After handover and subsequent restoration of the failed RSC, connect to the active RSC and use this command to return control of cards to the previously failed but now restored RSC.

Note that when you enter the command with the **shelf-resources** option, the RSC reloads.

Examples

The following example hands over control, to the peer RSC, of the slots and cards on the corresponding side of the chassis. Note the prompt to confirm clearing of calls, handover, and reload on the last line.

```
Router# redundancy handover shelf-resources busyout-period 10 at 22:00 3 Sep 2005

Newly entered handover schedule:
Busyout period at 22:00:00 PDT Sat Sep 3 2005 for a duration of 10 minutes
Handover pending at 22:10:00 PDT Sat Sep 3 2005
Clear calls, handover and reload as specified above? y
```

Related Commands

Command	Description
show redundancy debug-log	Displays up to 256 relevant debug entries.
show redundancy handover	Displays details of any pending handover (that is, a handover command that was entered previously and is not yet completed).
show redundancy history	Displays logged handover events.

redundancy stateful

To configure stateful failover for tunnels using IP Security (IPSec), use the **redundancy stateful** command in crypto map configuration mode. To disable stateful failover for tunnel protection, use the **no** form of this command.

redundancy *standby-group-name* **stateful**

no redundancy *standby-group-name* **stateful**

Syntax Description

standby-group-name	Refers to the name of the standby group as defined by Hot Standby Router Protocol (HSRP) standby commands. Both routers in the standby group are defined by this argument and share the same virtual IP (VIP) address.

Defaults

Stateful failover is not enabled for IPSec tunnels.

Command Modes

Crypto map configuration

Command History

Release	Modification
12.3(11)T	This command was introduced.

Usage Guidelines

The **redundancy stateful** command uses an existing IPSec profile (which is specified via the **crypto ipsec profile** command) to configure IPSec stateful failover for tunnel protection. (You do not configure the tunnel interface as you would with a crypto map configuration.) IPSec stateful failover enables you to define a backup IPSec peer (secondary) to take over the tasks of the active (primary) router if the active router is deemed unavailable.

The tunnel source address must be a VIP address, and it must not be an interface name.

Examples

The following example shows how to configure stateful failover for tunnel protection:

```
crypto ipsec profile peer-profile
  redundancy HA-out stateful

interface Tunnel1
 ip unnumbered Loopback0
 tunnel source 209.165.201.3
 tunnel destination 10.0.0.5
 tunnel protection ipsec profile peer-profile
!
interface Ethernet0/0
 ip address 209.165.201.1 255.255.255.224
 standby 1 ip 209.165.201.3
 standby 1 name HA-out
```

Related Commands

Command	Description
crypto ipsec profile	Defines the IPSec parameters that are to be used for IPSec encryption between two routers and enters crypto map configuration mode.

reset (alarm-interface)

To reset the CPU in the alarm interface controller (AIC), use the **reset** command in alarm-interface mode.

reset

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values

Command Modes

Alarm-interface

Command History

Release	Modification
12.2(2)XG	This command was introduced on the Cisco 2600 series and Cisco 3600 series.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.

Usage Guidelines

A change in the AIC IP configuration might not take effect until the next time the card is started. Use the **reset** command to restart the card. This command does not have a **no** form.

Examples

The following example shows a message that might be returned after the **reset** command is entered:

```
Router(alarm-aic)# reset

Selected card in slot 1 restarted
```

Related Commands

Command	Description
alarm-interface	Enters alarm-interface mode and configures the AIC.

ring-speed

To set the ring speed for the CSC-1R and CSC-2R Token Ring interfaces, use the **ring-speed** command in interface configuration mode.

ring-speed *speed*

Syntax Description

speed	Integer that specifies the ring speed, either 4 for 4-Mbps operation or 16 for 16-Mbps operation. The default is 16.

Defaults

16-Mbps operation

Caution Configuring a ring speed that is wrong or incompatible with the connected Token Ring causes the ring to beacon, which makes the ring nonoperational.

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command does not have a **no** form.

Examples

The following example shows how to sets the ring speed to 4 Mbps on a Token Ring interfaces:

```
Router(config)# interface tokenring 0
Router(config-if)# ring-speed 4
```