map-class dialer

To define a class of shared configuration parameters associated with the **dialer map** command for outgoing calls from an ISDN interface and for PPP callback, use the **map-class dialer** command in global configuration mode.

map-class dialer *class-name*

no map-class dialer *class-name*

Syntax Description

class-name	Unique class identifier.

Defaults

Command is disabled; no class name is provided.

Command Modes

Global configuration

Command History

Release	Modification
11.0	This command was introduced.

Usage Guidelines

The *class-name* argument in the **map-class dialer** command used to specify the class must be the same as a *class-name* argument used in a **dialer map** command.

This command is used on the PPP callback server, not on the callback client.

This command is used to define classes of calls for PPP callback for dial-on-demand routing (DDR), for ISDN Advice of Charge, and for Network Specific Facilities (NSF) call-by-call dialing plans.

For NSF call-by-call support on ISDN Primary-4ESS switches only, use one of the dialing-plan keywords listed in Table 14.

Table 14 NSF Keywords and Supported Services

Keyword	NSF Dialing Plan	Data	Voice	International
sdnplan	SDN	Yes	Yes	GSDN (Global SDN)
megaplan	MEGACOMM	No	Yes	Yes
accuplan	ACCUNET	Yes	Yes	Yes

Examples

The following example configures the PPP callback server on an ISDN BRI interface on a router in Atlanta. The callback server requires an enable timeout and a map class to be defined.

```
interface BRI0
 ip address 10.1.1.7 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
```

```
 dialer map ip 10.1.1.8 name atlanta class dial1 81012345678901
 dialer-group 1
 ppp callback accept
 ppp authentication chap
!
map-class dialer dial1
 dialer callback-server username
```

The following example configures the ISDN switch type to Primary-4ESS and configures ISDN PRI on T1 controller 1/0, and sets the D channel for dialer map classes that reference the NSF dialing plans. Finally, the **map-class dialer** command uses a dialing plan keyword and the **dialer outgoing** command refers to the same plan.

```
isdn switch-type primary-4ess
!
!
controller T1 1/0
 framing esf
 linecode b8zs
 pri-group timeslots 1-24
!
interface Serial1/0:23
 description This is the DMS D-channel 415-886-9503
 ip address 10.1.1.3 255.255.255.0
 encapsulation ppp
 no keepalive
 dialer map ip 10.1.1.1 name detroit class sdnplan 14155770715
 dialer map ip 10.1.1.2 name oakland class megaplan 14155773775
 dialer map ip 10.1.1.4 name oakland class accuplan 14155773778
 dialer-group 1
 ppp authentication chap
!
map-class dialer sdnplan
 dialer outgoing sdn
!
map-class dialer megaplan
 dialer voice-call
 dialer outgoing mega
!
map-class dialer accuplan
 dialer outgoing accu
```

The following partial example configures BRI interface 0 to function as the callback server on the shared network. The callback server requires an enable timeout and a map class to be defined.

```
interface BRI0
 ip address 10.2.1.7 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
 dialer map ip 10.2.1.8 name atlanta class dial1 81012345678901
 dialer-group 1
 ppp callback accept
 ppp authentication chap
!
map-class dialer dial1
 dialer callback-server username
```

The following example configures a map class named “hawaii” and sets an ISDN speed of 56 kbps for the class.

```
map-class dialer hawaii
 isdn speed 56
```

Related Commands

Command	Description
dialer map	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
dialer string (legacy DDR)	Specifies the destination string (telephone number) to be called for interfaces calling a single site.
show controllers e1	Displays information about the E1 links supported by the NPM (Cisco 4000) or MIP (Cisco 7500 series).

member

To alter the configuration of an asynchronous interface that is a member of a group, use the **member** command in interface configuration mode. To restore defaults set at the group master interface, use the **no** form of this command.

member *asynchronous-interface-number command*

no member *asynchronous-interface-number command*

Syntax Description

asynchronous-interface-number	Number of the asynchronous interface to be altered.
command	One or both of the following commands entered for this specific interface: • **peer default ip address** • **description**

Defaults

No individual configurations are set for member interfaces.

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

You can customize a member interface by using the **member** command. Interfaces are designated as members of a group by using the **interface group-async** and **group-range** commands.

Examples

The following example defines interface 3 with a description of line 3, which is attached to a Hayes Optima modem:

```
interface group-async 0
  member 3 description line #3 Hayes Optima
```

Related Commands

Command	Description
group-range	Creates a list of member asynchronous interfaces (associated with a group interface).
interface group-async	Creates a group interface that will serve as master, to which asynchronous interfaces can be associated as members.

member (dial peer cor list)

To add a member to a dial peer class of restrictions (COR) list, use the **member** command in dial peer COR list configuration mode. To remove a member from a list, use the **no** form of this command.

member *class-name*

no member *class-name*

Syntax Description

class-name	Class name previously defined in dial peer COR custom configuration mode by using of the **name** command.

Defaults

No default behavior or values.

Command Modes

Dial peer COR list configuration

Command History

Release	Modification
12.1(3)T	This command was introduced.

Examples

The following example adds three members to the COR list named list3:

```
dial-peer cor list list3
 member 900_call
 member 800_call
 member catchall
```

Related Commands

Command	Description
dial-peer cor list	Defines a COR list name.

modem answer-timeout

To set the amount of time that the Cisco IOS software waits for the Clear to Send (CTS) signal after raising the data terminal ready (DTR) signal in response to RING, use the **modem answer-timeout** command in line configuration mode. To revert to the default value, use the **no** form of this command.

modem answer-timeout *seconds*

no modem answer-timeout

Syntax Description

seconds	Timeout interval in seconds, in the range from 0 to 65535.

Defaults

15 seconds

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command is useful for modems that take a long time to synchronize to the appropriate line speed.

For more information, see the chapter "Creating and Using Modem Chat Scripts" in the *Cisco IOS Dial Technologies Configuration Guide*.

Examples

The following example sets the timeout interval to 20 seconds for the modem connected to lines 3 through 13:

```
line 3 13
 modem answer-timeout 20
```

Related Commands

Command	Description
modem callin	Supports dial-in modems that use the DTR signal to control the off-hook status of the modem.
modem inout	Configures a line for both incoming and outgoing calls.

modem at-mode

To open a directly connected session and enter AT command mode, which is used for sending AT (modem attention) commands to Microcom manageable modems, use the **modem at-mode** command in EXEC mode.

modem at-mode *slot/port*

no modem at-mode *slot/port*

Syntax Description

slot/port	Slot number and modem port number. Include the slash mark when entering this variable.

Defaults

Command is disabled.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Manageable modems return "OK" if the AT command you send is successfully enabled. Press Ctrl-C after sending an AT command to close the directly connected session.

Note This command does not apply to basic modems that have out-of-band ports.

Examples

The following example opens a directly connected session on modem 1/1, enters AT command mode on modem 1/1, and transmits the AT commands through the out-of-band feature of modem 1/1:

```
Router# modem at-mode 1/1

You are now entering AT command mode on modem (slot 1 / port 1).
Please type CTRL-C to exit AT command mode.
at%v

MNP Class 10 V.34/V.FC Modem Rev 1.0/85

OK
at\s

IDLE           000:00:00
LAST DIAL

NET ADDR:      FFFFFFFFFFFF
MODEM HW: SA 2W United States
4 RTS 5 CTS 6 DSR - CD 20 DTR - RI
```

```
MODULATION      IDLE
MODEM BPS       28800  AT%G0
MODEM FLOW      OFF    AT\G0
MODEM MODE      AUT    AT\N3
V.23 OPR.       OFF    AT%F0
AUTO ANS.       ON     ATS0=1
SERIAL BPS      115200 AT%U0
BPS ADJUST      OFF    AT\J0
SPT BPS ADJ.    0      AT\W0
ANSWER MESSGS   ON     ATQ0
SERIAL FLOW     BHW    AT\Q3
PASS XON/XOFF   OFF    AT\X0
PARITY          8N     AT
```

Related Commands

Command	Description
clear modem	Resets the hardware for one or more manageable modems on access servers and routers.

modem at-mode-permit

To permit a Microcom modem to accept a directly connected session, use the **modem at-mode-permit** command in line configuration mode. To disable permission for modems to accept a direct connection, use the **no** form of this command.

modem at-mode-permit

no modem at-mode-permit

Syntax Description

This command has no arguments or keywords.

Defaults

Command is enabled.

Command Modes

Line configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

After you enter this command, enter the **modem at-mode** command to enable a directly connected session on the modem. From AT command mode, you can enter AT (modem attention) commands directly from your terminal session.

For a complete list of supported AT commands, refer to the AT command documentation that came with your access server or router.

The **no modem at-mode-permit** command disables a modem from accepting a direct connection, which is useful for ensuring modem security.

Note This command does not apply to basic modems, which do not have out-of-band ports.

Examples

The following example permits the modem connected to TTY line 1 to accept a directly connected session:

```
line 1
 modem at-mode-permit
```

Related Commands

Command	Description
clear modem	Resets the hardware for one or more manageable modems on access servers and routers.
modem at-mode	Opens a directly connected session and enters AT command mode, which is used for sending AT commands to Microcom manageable modems.

modem autoconfigure discovery

To configure a line to discover which kind of modem is connected to the router and to configure that modem automatically, use the **modem autoconfigure discovery** command in line configuration mode. To disable this feature, use the **no** form of this command.

modem autoconfigure discovery

no modem autoconfigure discovery

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Line configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

The modem is identified each time the line is reset. If a modem cannot be detected, the line continues retrying for 10 seconds. When the modem type is determined, this information remains stored until the modem is recycled or disconnected. Using Discovery mode is much slower than configuring a line directly.

Each time the modem is reset (every time a chat reset script is executed), a string of commands is sent to the modem, the first one being "return to factory-defaults."

Examples

The following example automatically discovers which kind of modem is attached to the router or access server:

```
modem autoconfigure discovery
```

Related Commands

Command	Description
modem autoconfigure type	Directs a line to attempt to configure the attached modem using a predefined modemcap.

modem autoconfigure type

To direct a line to attempt to configure the attached modem using the entry for the *modem-type* argument, use the **modem autoconfigure type** command in line configuration mode. To disable this feature, use the **no** form of this command.

modem autoconfigure type *modem-type*

no modem autoconfigure type

Syntax Description

modem-type	Modem type, such as a Codex 3260.

Defaults

No default behavior or values.

Command Modes

Line configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

The modem is reconfigured each time the line goes down.

Examples

The following example automatically configures the attached modem using the codex_3260 modemcap entry:

```
modem autoconfigure type codex_3260
```

Related Commands

Command	Description
modem autoconfigure discovery	Configures a line to discover which kind of modem is connected to the router and to configure that modem automatically.

modem autotest

Support for the **modem autotest** command was removed in Cisco IOS Release 12.2(11)T. The use of this command is not recommended. In most cases, nonfunctional integrated modems will automatically be removed from service by the system. See the **modem recovery action** command and the **spe recovery** command for more configuration options for nonfunctional modems. For further information about MICA modem recovery, refer to the *Configuring MICA Modem Recovery* technical note. For further information about NextPort service processing element (SPE) recovery, refer to the *Configuring NextPort SPE Recovery* technical note.

modem bad

To remove an integrated modem from service and indicate it as suspected or proven to be inoperable, use the **modem bad** command in line configuration mode. To restore a modem to service, use the **no** form of this command.

modem bad

no modem bad

Syntax Description

This command has no arguments or keywords.

Defaults

Command is disabled.

Command Modes

Line configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

If you mark a modem as inoperable, it appears as Bad—without the asterisk (*)—in the Status column of the **show modem** command output. A modem marked inoperable by the **modem startup-test** command appears as Bad* in the **show modem** command output. Use the **no modem bad** command to unmark a modem as Bad* or Bad and restore it for dialup connection services.

Note Only idle modems can be marked bad by the **modem bad** command. If you want to mark a modem bad that is actively supporting a call, first issue the **modem shutdown** command then issue the **modem bad** command.

Examples

The first part of the following example shows a successful connection between modem 2/1 and modem 2/0, which verifies normal operating conditions between these two modems. However, when modem 2/1 is tested against modem 2/3, the back-to-back modem test fails. Therefore, modem 2/3 is suspected or proven to be inoperable. Modem 2/3 is removed from dialup services through the use of the **modem bad** command on line 28.

```
Router# test modem back-to-back 2/1 2/0

Repetitions (of 10-byte packets) [1]: 10

Router#

%MODEM-5-B2BCONNECT: Modems (2/1) and (2/0) connected in back-to-back test: CONN
ECT9600/REL-MNP
%MODEM-5-B2BMODEMS: Modems (2/0) and (2/1) completed back-to-back test: success/
packets = 20/20
```

```
Router# test modem back-to-back 2/1 2/3

Repetitions (of 10-byte packets) [1]: 10
Router#
%MODEM-5-BADMODEMS: Modems (2/3) and (2/1) failed back-to-back test: NOCARRIER

Router# configure terminal

Router(config)# line 28
Router(config-line)# modem bad
Router(config-line)# end
```

Related Commands

Command	Description
modem startup-test	Performs diagnostic testing on each integrated modem during the rebooting process.
show modem at-mode	Displays a high-level performance report for all the modems or a single modem.
test modem back-to-back	Diagnoses an integrated modem that may not be functioning properly.

modem buffer-size

To configure the size of the history event queue buffer for integrated modems installed in an access server or router, use the **modem buffer-size** command in global configuration mode.

modem buffer-size *events*

no modem buffer-size *events*

Syntax Description

events	Defined number of modem events that each manageable modem is able to store. Default is 100 events.

Defaults

100 modem events

Command Modes

Global configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

A large buffer size uses substantial amounts of processing memory. If the processing memory is running low, reduce the modem buffer size.

To display modem events, use the **show modem log** command.

Note This command does not apply to basic modems that have out-of-band ports.

Examples

The following example enables each modem in the access server to store 150 modem events:

```
modem buffer-size 150
```

Related Commands

Command	Description
show modem log	Displays the modem history event status performed on a manageable modem or group of modems.

modem busyout

To gracefully disable a modem from dialing or answering calls, use the **modem busyout** command in line configuration mode. To reenable a modem, use the **no** form of this command.

modem busyout

no modem busyout

Syntax Description

This command has no arguments or keywords.

Defaults

Command is disabled.

Command Modes

Line configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The disabling action is not executed until the active modem returns to an idle state. No active connections are interrupted when you enter this command. If the **modem busyout-threshold** command is set, this command will be delayed until the DS0 lines to the exchange are taken out of service. For T3 cards the message "No Controller configured" might appear for unconfigured T1 links in the T3.

Examples

The following example disables the modem associated with line 1/0/5 from dialing and answering calls. You do not specify a slot or port number with this command.

```
line 1/0/5
 modem busyout
```

The following example busyouts a range of modems:

```
line 1/0/5 1/0/72
 modem busyout
```

The following example disables the modem associated with line 1 from dialing and answering calls. You do not specify a slot or port number with this command.

```
line 1
 modem busyout
```

Related Commands

Command	Description
busyout	Informs the central-office switch that a channel is out-of-service.
ds0 busyout (channel)	Forces a DS0 time slot on a controller into the busyout state.
modem shutdown	Abruptly shuts down an active or idle modem installed in an access server or router.

modem busyout-threshold

To define a threshold to maintain a balance between the number of DS0s and modems, use the **modem busyout-threshold** command in global configuration mode. To remove the threshold, use the **no** form of this command.

modem busyout-threshold *threshold-number*

no modem busyout-threshold *threshold-number*

Syntax Description

threshold-number	Number of modems that are free when the router should enforce the stipulation that the number of free DS0 lines is less than or equal to the number of modems.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

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

Usage Guidelines

The **modem busyout-threshold** command functionality is also often termed *autobusyout*. This command applies to all DS0 lines coming into the router and counts all free modems in all pools.

The **modem busyout-threshold** command periodically checks to determine if the number of free modems is less than the user specified threshold and if it is it ensures that the number of free DS0 channels is less than or equal to the number of modems.

This command should be used only where excess calls to one router are forwarded by the exchange to an additional router on the same exchange group number.

Because the **modem busyout-threshold** command checks only periodically, the threshold should be greater than the number of calls the user expects to receive in 1 minute plus a safety margin. For example, if the user receives an average of 10 calls per minute, then a threshold of 20 would be advised. Very small thresholds should be avoided because they do not allow sufficient time for the exchange to respond to out-of-service notifications from the router, and callers may receive busy signals when free modems are all used.

Caution The number of DS0 lines in normal operating conditions should be approximately equal to the number of modems (for example, within 30). If this is not the case, it will cause a lot of messaging traffic to the exchange and may cause active calls to be dropped. This caution is not a concern for short periods, that is, when modem cards are replaced.

On T3 controllers, any contained T1 controllers that are not in use should be undeclared to remove them from the autobusyout list.

Note On T3 controllers, any contained T1 controllers that are not in use should be undeclared to remove them from the autobusyout list.This command is the same as the **ds0 busyout-threshold** command for the Cisco AS5300 and AS5800 access servers.

Examples

The following example shows how you might configure the **modem busyout-threshold** command:

```
modem busyout-threshold 30
```

Related Commands

Command	Description
busyout	Informs the central-office switch that a channel is out-of-service.
ds0 busyout (channel)	Forces a DS0 timeslot on a controller into the busyout state.
modem busyout	Disables a modem from dialing or answering calls whereby the disabling action is not executed until the active modem returns to an idle state.
modem shutdown	Abruptly shuts down an active or idle modem installed in an access server or router.

modem call-record

To activate the logging of a summary of modem events upon the termination of a call, use the **modem call-record** command in global configuration mode. To deactivate modem event logging of calls, use the **no** form of this command.

modem call-record terse [**quiet**] [**max userid** *character-max*]

no modem call-record

Syntax Description

terse	Specifies that only significant data is logged to the Modem Call Record (MCR).
quiet	(Optional) Specifies that the MCR is sent only to the syslog server and not to the console.
max userid *character-max*	(Optional) Sets the maximum number of characters of the user ID that will be entered into the MCR. The default length is 30 characters.

Defaults

Logging of modem events is off.

Command Modes

Global configuration

Command History

Release	Modification
11.3(6)AA	This command was introduced.
11.3(9)AA	The **max-userid** keyword was added.
12.0(4)T	The **max-userid** keyword was added.
12.1(1)	Support was added for NM-AM and NM-DM modem boards on the Cisco 2600 and Cisco 3600 series routers.
12.1(2)T	The **quiet** keyword was added.

Usage Guidelines

The modem management subsytem provides event logs for each modem at each major event during usage of the modems. The volume of event logs being generated makes the monitoring of modem calls for debugging purposes difficult. The MCR log, activated using the **modem call-record** command, will log a summary of a modem call to syslog upon termination of the call. If a call fails to establish a connection, the call will be summarized in a Modem Call Failed Record.

The MCR is written to the syslog and can be displayed using the **terminal monitor** or **show logging** command, or by examining files on a syslog server.

The **modem call-record** command is supported on Cisco AS5200, AS5300, AS5800, 2600, and 3600 routers with integrated MICA technologies and Microcom modems. For systems with NextPort modems, use the **spe call-record modem** command.

The information provided in the MCR log and the Modem Call Failed Record log varies depending on the type of modem being used. Table 15 describes the significant fields in the display for MICA technologies and Microcom modems.

Table 15 modem call-record Field Descriptions

Field	Description
Interface slot	Interface slot of device assigned for call.
Interface controller unit	Interface controller unit of device assigned for call.
Interface channel	Interface channel of device assigned for call.
Modem type	Modem type used for call.
Modem slot/port	Physical location for modem handling the call.
Call id	Unique Call Identifier assigned to the modem call by the call switching module.
Userid	User ID of caller.
IP address	IP address assigned for caller.
Calling number	Modem calling number.
Called number	Modem called number.
Connected standard	Standard used for connection. Possible values are Bell103, Bell212, K56Flex 1.1, V.17, V.21, V.22, V.22bis, V.23, V.27, V.29, V.32, V.32bis, V.32terbo. V.34, V.34+, and V.90.
Connect protocol	Protocol user for connection. Possible values are ARA1.0, ARA2.0, ASYNC Mode, FAX Mode, LAP-M, MNP, SS7/COT, and SYNC Mode.
Compression	Compression method used for connection. Possible values are MNP5 data, none, V.42bis both, V.42bis RX, and V.42bis TX.
Initial RX bit rate	Actual bit rate from the remote Digital Signal Processor (DSP) to the local DSP at connect.
Initial TX bit rate	Actual bit rate from the local DSP to the remote DSP at connect.
Final RX bit rate	Actual bit rate from the remote DSP to the local DSP at disconnect.
Final TX bit rate	Actual bit rate from the local DSP to the remote DSP at disconnect.
RBS pattern[1]	Actual robbed bit signaling (RBS) pattern observed by the modem. The six LSBs of the returned value indicate the periodic RBS pattern where a one denotes a pulse code modulation sample with a robbed bit. (Only reported for K56Flex).
Digital pad[1]	Amount of digital padding (attenuation) in downlink, in decibels (dB). (Only reported for V.90 and K56Flex.)
Total retrains[1]	Count of total retrains and speed shifts.
Signal quality value[1]	Signal quality values in a range from 0 to 7, where 0 is the worst. The units are arbitrary, approximating abs(log10(SNR)).
SNR	Signal-to-noise ratio, ranging from 0 to 70 in dB steps.
Characters received	Count of total characters received for SYNC/ASYNC connection.

Table 15 modem call-record Field Descriptions (continued)

Field	Description
Characters transmitted	Count of total characters sent for SYNC/ASYNC connection.
Characters received BAD[1]	Total number of parity errored characters received (for ASYNC connections).
Error correction frames received OK	Count of error-free Error Correction frames received. Incorrect or duplicate frames are not included.
Error correction frames transmitted	Count of unique Error Correction frames sent. Re-sent frames are not included.
Error correction frames received BAD/ABORTED[1]	Total error correction retransmissions requested by this modem during the course of the link.
Call timer	Duration of call, in seconds.
Final state	State of modem call before it terminated.
Disconnect reason	Reason for call being disconnected. Each modem type handles parameter differently.

1. These fields are displayed only for MICA technologies modems.

Examples

The following example shows the activation of MCR logging:

```
modem call-record terse
```

The following is the MCR of a successful call on a MICA technologies modem:

```
*Aug 15 01:34:08.775: %CALLRECORD-3-MICA_TERSE_CALL_REC:
DS0 slot/contr/channel=1/0/22 modem=mica slot/port=1/2 call_id=0x3
userid=user1 ip=124.34.45.120
calling=#4085551212 called=#4085552222
std=V.34+ prot=LAP-M comp=None
init-rx/tx b-rate=31200/33600 finl-rx/tx b-rate=33600/33600
rbs=0 d-pad=None retr=2 sq=2 snr=28
rx/tx chars=1067/0 bad=0 rx/tx ec=0/0 bad=0
time=139 finl-state=Steady
disc=0xA220
       Type (=5 ):  Rx (line to host) data flushing, not OK
      Class (=2 ):  EC condition, locally detected
     Reason (=32):  received DISC frame -- normal LAPM termination
```

The following is the MCR of a failed call on a MICA technologies modem:

```
*Aug 15 16:47:54.527: %CALLRECORD-3-MICA_TERSE_CALL_FAILED_REC:
DS0 slot/contr/channel=1/0/22 modem=mica slot/port=1/2 call_id=0x9
calling=4085551212# called=#4085552222
time=2 finl-state=Link
disc=0x7F06
       Type (=3 ):  Condition occurred during call setup
      Class (=31):  Requested by host
     Reason (=6 ):  network indicated disconnect
```

The following is the MCR of a successful call on a Microcom modem:

```
01:17:30: %CALLRECORD-3-MCOM_TERSE_CALL_REC:
DS0 slot/contr/channel=0/0/22 modem=microcom_server slot/port=0/2 call_id=0x3
userid=sque ip=124.34.46.111
calling=#4085551111 called=#4085552222
std=V34 prot=Normal comp=None
Init-RX/TX b-rate=33600/31200 Finl-RX/TX b-rate=33600/33600
SNR=47
RX/TX chars=0/0 RX/TX EC=0/0
time=73 Disc(local)=0x9 DTR Drop Disc(remote)=0x0 Unknown
```

The following is the MCR of a failed call on a Microcom modem:

```
Microcom Terse Modem Call Failed Record Log:
19:28:55: %CALLRECORD-3-MCOM_TERSE_CALL_FAILED_REC:
DS0 slot/contr/channel=0/0/0 modem=microcom_server slot/port=0/2 call_id=0xA003
calling=4085551111# called=#4085552222
time=0 finl-state=Dialing/Answering
disc(local)=0x9 DTR Drop disc(remote)=0x0 Unknown
```

Related Commands

Command	Description
calltracker call-record	Enables call record syslog generation for the purpose of debugging, monitoring, or externally saving detailed call record information.
show logging	Displays the state of logging (syslog).
spe call-record modem	Generates a modem call record at the end of each call.
terminal monitor	Displays **debug** command output and system error messages for the current terminal and session.

modem callin

To support dial-in modems that use the data terminal ready (DTR) signal to control the off-hook status of the modem, use the **modem callin** command in line configuration mode. To disable this feature, use the **no** form of this command.

modem callin

no modem callin

Syntax Description

This command has no arguments or keywords.

Defaults

No modem control

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

In response to the RING signal, the router raises the DTR signal, which indicates to the modem that it should answer the call. At the end of the session, the Cisco IOS software lowers the DTR signal, which disconnects the modem. This command is useful for older modems that do not support autoanswer.

This command uses clear to send (CTS), whereas other modem commands in the Cisco IOS software use data set ready (DSR).

Only use the **modem callin** command on the ASM terminal server, where hardware flow control is not possible. If you have a Cisco 2500 or 3600 series router, use the **modem dialin** command instead.

Examples

The following example configures lines 10 through 16 for dial-in modems that can run at speeds from 300 to 19,200 bits per second:

```
line 10 16
 modem callin
 autobaud
```

Related Commands

Command	Description
modem answer-timeout	Sets the amount of time that the Cisco IOS software waits for the CTS signal after raising the DTR signal in response to RING.
modem inout	Configures a line for both incoming and outgoing calls.

modem callout

To configure a line for reverse connections, use the **modem callout** command in line configuration mode. To disable this feature, use the **no** form of this command.

modem callout

no modem callout

Syntax Description

This command has no arguments or keywords.

Defaults

No modem control

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command supports ports connected to computers that would normally be connected to modems. It causes the access server to act somewhat like a modem.

This command uses the clear to send (CTS) signal and should be used only on access servers that do not support hardware flow control. If you have an access server that is newer than the ASM terminal server (such as a Cisco 2500 or Cisco 3600 series routers, or a Cisco AS5100 or Cisco AS5200 access servers), use the **modem host** command instead. The **modem callout** command uses CTS, whereas the **modem host** command uses data set ready/ data carrier detect (DSR/DCD.) If CTS is used for modem control instead of DSR/DCD, it prevents CTS from being used by hardware flow control.

Examples

The following example configures lines 17 through 32 in reverse connection mode to a large terminal switch. By using Telnet to connect to a TCP port on this host, the user gets the next free line in the rotary group.

```
line 17 32
 rotary 1
 modem callout
```

Related Commands

Command	Description
modem inout	Configures a line for both incoming and outgoing calls.
show async-bootp	Displays the extended BOOTP request parameters that have been configured for asynchronous interfaces.

modem country mica

To configure the modem country code for a bank of MICA technologies modems, use the **modem country mica** command in global configuration mode. To remove a country code from service, use the **no** form of this command.

modem country mica *country*

no modem country mica *country*

Syntax Description

country	Country name. See Table 16 for a list of the supported country name keywords.

Defaults

Command is disabled.

Command Modes

Global configuration

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

Table 16 lists the supported codes for the *country* argument.

Table 16 MICA Country Names

australia
austria
belgium
china
cyprus
czech-republic (Czech/Slovak Republic)
denmark
e1-default (Default E1, a-law)
finland
france
germany
hong-kong
india
ireland
israel
italy

Table 16 MICA Country Names (continued)

japan
malaysia
netherlands
new-zealand
norway
poland
portugal
russia
singapore
south-africa
spain
sweden
switzerland
t1-default (Defaults T1, u-law)
taiwan
thailand
turkey
united-kingdom
usa

The following example sets the MICA technologies modems for operation in Sweden:

```
modem country mica sweden
```

Related Commands

Command	Description
modem country microcom_hdms	Configures the modem country code for a bank of Microcom modems.

modem country microcom_hdms

To configure the modem country code for a bank of Microcom High Density Management System (HDMS) modems, use the **modem country microcom_hdms** command in global configuration mode. To remove a country code from service, use the **no** form of this command.

modem country microcom_hdms *country*

no modem country microcom_hdms *country*

Syntax Description

country	Country name. See Table 17 for a list of the supported country name keywords.

Defaults

No country code is enabled.

Command Modes

Global configuration

Command History

Release	Modification
11.2 P	This command was introduced.
12.0	The **europe** keyword was added.

Usage Guidelines

Table 17 lists the supported codes for the *country* argument.

Table 17 Microcom Country Names

argentina
australia
austria
belgium
brazil
canada
chile
china
columbia
czech-republic (Czech/Slovak Republic)
denmark
europe
finland
france
germany

Table 17 Microcom Country Names (continued)

greece
hong-kong
hungary
india
indonesia
finland
israel
italy
japan
korea
malaysia
mexico
netherlands
norway
peru
philippines
poland
portugal
saudi-arabia
singapore
south-africa
spain
sweden
switzerland
taiwan
thailand
united-kingdom
usa

Examples

The following example shows the different duplex configuration options you can configure on a Cisco AS5300:

```
Router(config)# modem country microcom_hdms ?

  argentina       Argentina
  australia       Australia
  austria         Austria
  belgium         Belgium
  chile           Chile
  china           China
  columbia        Columbia
```

```
czech-republic  Czech/Slovak Republic
denmark         Denmark
europe          Europe
finland         Finland
france          France
germany         Germany
greece          Greece
hong-kong       Hong Kong
india           India
indonesia       Indonesia
ireland         Ireland
israel          Israel
italy           Italy
japan           Japan
korea           Korea
malaysia        Malaysia
mexico          Mexico
netherlands     Netherlands
new-zealand     New Zealand
norway          Norway
peru            Peru
philippines     Philippines
poland          Poland
portugal        Portugal
saudi-arabia    Saudi Arabia
singapore       Singapore
south-africa    South Africa
spain           Spain
sweden          Sweden
switzerland     Switzerland
taiwan          Taiwan
thailand        Thailand
united-kingdom  United Kingdom
usa             USA
```

Related Commands

Command	Description
modem country mica	Configures the modem country code for a bank of MICA technologies modems.

modem cts-required

The **modem cts-required** command is replaced by the **modem printer** command. See the description of the **modem printer** command for more information.

modem dialin

To configure a line to enable a modem attached to the router to accept incoming calls only, use the **modem dialin** command in line configuration mode. To disable this feature, use the **no** form of this command.

modem dialin [**delay**]

no modem dialin

Syntax Description

delay	(Optional) Causes the operating system to delay assertion of the data terminal ready (DTR) signal until a network connection is established.

Defaults

Incoming calls to the modem are not permitted.

Command Modes

Line configuration

Command History

Release	Modification
11.1	This command was introduced.
12.2(4)T	The **delay** keyword was added to support the Cisco modem user interface.

Usage Guidelines

This command supports modems that can automatically handle telephone line activity, such as answering the telephone after a certain number of rings.

The **delay** keyword is useful when using the **modemui** EXEC command with software that requires a signal assertion to recognize that a connection has been established. It may be necessary to reroute the router DTR signal to an alternate EIA-232 pin such as Carrier Detect (CD) for the delay to work properly.

Examples

The following example configures a line for a high-speed modem:

```
line 5
 modem dialin
```

The following example shows how to set up a delay in a line configured for the Cisco modem user interface feature:

```
line aux 0
 login authentication modem
 modem dialin delay
 autocommand  modemui
 transport input all
 stopbits 1
 speed 38400
 flowcontrol hardware
```

Related Commands

Command	Description
modem inout	Configures a line for both incoming and outgoing calls.
modemui	Enters the Cisco modem user interface mode.
parity	Defines generation of a parity bit.

modem dialout controller

To specify a particular T1 or E1 controller through which to dial out, use the **modem dialout controller** command in line configuration mode. To disable the command, use the **no** form of this command.

modem dialout controller {**e1** | **t1**} {*controller-list*}

no modem dialout controller

Syntax Description

e1	Wide-area digital transmission scheme used predominantly in Europe.
t1	Wide-area digital carrier facility.
controller-list	List of controllers through which to dial out. The range is from 0 to 7. List the controllers individually (1, 2, 3, for example).

Defaults

All T1 and E1 controllers are used for dial out.

Command Modes

Line configuration

Command History

Release	Modification
12.2	This command was introduced.

Usage Guidelines

This command is only supported on the Cisco AS5300, Cisco AS5350, Cisco AS5400, and Cisco AS5800.

Examples

In the following example, the router is configured to use the controller t1 0, t1 1, t1 3 (and no others) when dialing out from lines 1 through 60:

```
line 1 60
 modem dialout controller t1 0,1,3
```

modem dtr-active

To configure a line to leave data terminal ready (DTR) signals low, unless the line has an active incoming connection or an EXEC process, use the **modem dtr-active** command in line configuration mode. To disable this feature, use the **no** form of this command.

modem dtr-active

no modem dtr-active

Syntax Description

This command has no arguments or keywords.

Defaults

No modem control.

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command does not use the Carrier Detect (CD) signal.

This command can be useful if the line is connected to an external device (for example, a time-sharing system) that must know whether a line is in active use. The **modem dtr-active** command is similar to the **no modem** line configuration command.

Examples

The following example configures a line for low DTR:

```
line 5
 modem dtr-active
```

Related Commands

Command	Description
modem printer	Configures a line to require a DSR signal instead of CTS.

modem hold-reset

To reset and isolate integrated modems for extensive troubleshooting, use the **modem hold-reset** command in line configuration mode. To restart a modem, use the **no** form of this command.

modem hold-reset

no modem hold-reset

Syntax Description

This command has no arguments or keywords.

Defaults

Command is disabled.

Command Modes

Line configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **modem hold-reset** command for the V.110 port module resets the processor on board the module only if the command is executed on all 12 ports. If the **modem hold-reset** command is issued on only a portion of the V.110 ports, the processor will not reset.

This command is also used to reset a modem that is frozen in a suspended state. Disable the suspended modem with the **modem hold-reset** command, and then restart initialization with the **no modem hold-reset** command.

Examples

The following example disables the suspended modem using tty line 4 and resets the modem's initialization:

```
line 4
 modem hold-reset
 no modem hold-reset
```

The following examples resets a 12-port V.110 port module. You must specify the entire tty line range for the entire bank of ports.

```
line 1 12
 modem hold-reset
 no modem hold-reset
```

Related Commands

Command	Description
modem autotest	Automatically and periodically performs a modem diagnostics test for modems inside the access server or router.

modem host

To configure a line for reverse connections where hardware flow control is also required, use the **modem host** command in line configuration mode. To disable the line modem control for reverse connections, use the **no** form of this command.

modem host

no modem host

Syntax Description

This command has no arguments or keywords.

Defaults

No modem control

Command Modes

Line configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

This command supports ports connected to computers that would normally be connected to modems. This command causes the access server to act like a modem.

The **modem host** command is identical in operation to the **modem callout** command except that data set ready/data carrier detect (DSR/DCD) is used for modem control instead of clear to send (CTS). This frees CTS for use by hardware flow control.

Examples

The following example configures a line to send a DSR/DCD active signal to the modem for data switches and hosts:

```
line 5
 modem host
```

Related Commands

Command	Description
modem callout	Configures a line for reverse connections.
modem printer	Configures a line to require a DSR signal instead of CTS.

modem inout

To configure a line for both incoming and outgoing calls, use the **modem inout** command in line configuration mode. To disable the configuration, use the **no** form of this command.

modem inout

no modem inout

Syntax Description

This command has no arguments or keywords.

Defaults

No modem control.

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command uses DSR and RING signals for carrier detection.

The Cisco IOS software does not support any dialing protocols; therefore, the host system software or the user must provide any special dialing commands when using the modem for outgoing calls.

Examples

The following example configures a line for both incoming and outgoing calls:

```
line 5
 modem inout
```

Related Commands

Command	Description
parity	Defines generation of a parity bit.

modem link-info poll time

To set the polling interval at which link statistics are retrieved from the MICA technologies modem, use the **modem link-info poll time** command in global configuration mode. To return to the default condition, use the **no** form of this command.

modem link-info poll time *seconds*

no modem link-info poll time *seconds*

Syntax Description

seconds	Number of seconds between polling intervals. The valid range is from 10 to 65535.

Defaults

Link statistics are not polled.

Command Modes

Global configuration

Command History

Release	Modification
12.1(3)T	This command was introduced.

Usage Guidelines

The **modem link-info poll time** command periodically polls active modem sessions to collect information such as attempted transmit and receive rates, maximum and minimum transmit and receive rates, and locally and remotely issued retrains and speedshift counters. This data is polled from MICA portware and passed unsolicited to Cisco IOS software.

Enabling the **modem link-info poll time** command disables the **modem poll time** command. Any **modem poll time** configuration is ignored because all modem events are sent to the access server unsolicited and no longer require polling by Cisco IOS software.

Note The **modem link-info poll time** command consumes a substantial amount of memory, approximately 500 bytes for each MICA modem call. You should use this command only if you require the specific data that it collects; for instance, if you have enabled Call Tracker on your access server using the **calltracker call-record** command.

Examples

The following example polls link statistics at 90 second intervals:

```
modem link-info poll time 300
```

Related Commands

Command	Description
calltracker call-record	Enables Call Tracker on the access server.
show call calltracker active	Displays the detailed data stored within Call Tracker for active calls.
show call calltracker handle	Displays the detailed data stored within Call Tracker for a specific call specified unique call handle identifier.
show call calltracker history	Displays the detailed data stored within Call Tracker for terminated calls.
show modem calltracker	Displays the detailed data stored within Call Tracker for the last call on the specified modem.

modem log

To configure the types of EIA/TIA events that are stored in the modem log, use the **modem log** command in line configuration mode. To prevent a type of EIA/TIA event from being stored in the modem log, use the **no** form of this command.

modem log {**cts** | **dcd** | **dsr** | **dtr** | **ri** | **rs232** | **rts** | **tst**}

no modem log {**cts** | **dcd** | **dsr** | **dtr** | **ri** | **rs232** | **rts** | **tst**}

Syntax Description

cts	Specifies that EIA/TIA clear to send (CTS) events are stored in the modem log.
dcd	Specifies that EIA/TIA data carrier detect (DCD) events are stored in the modem log.
dsr	Specifies that EIA/TIA data set ready (DSR) events are stored in the modem log.
dtr	Specifies that EIA/TIA data terminal ready (DTR) events are stored in the modem log.
ri	Specifies that EIA/TIA ring indication (RI) events are stored in the modem log.
rs232	Specifies that all EIA/TIA events are stored in the modem log.
rts	Specifies that EIA/TIA request to send (RTS) events are stored in the modem log.
tst	Specifies that EIA/TIA transmit signal timing (TST) events are stored in the modem log.

Defaults

No EIA/TIA events are logged.

Command Modes

Line configuration

Command History

Release	Modification
11.3 AA	This command was introduced for the Cisco AS5300 access server.
12.0(5)T	This command was implemented on the Cisco AS5800 access server.

Usage Guidelines

Use the **modem log** command to suppress the storage of undesired EIA/TIA history events in the modem log.

Examples

The following example configures the storage of EIA/TIA CTS and DSR events on lines 1 through 120:

```
line 1 120
 modem log cts
 modem log dsr
```

Related Commands

Command	Description
show modem log	Displays the modem history event status performed on a manageable modem or group of modems.

modem min-speed max-speed

To configure various modem-service parameters, use the **modem min-speed max-speed** command in service profile configuration mode. To remove modem parameters, use the **no** form of this command.

modem min-speed {*speed* | **any**} **max-speed** {*speed* | **any** [**modulation** *value*]}

no modem min-speed {*speed* | **any**} **max-speed** {*speed* | **any** [**modulation** *value*]}

Syntax Description

speed	Minimum and maximum bit rate for the modems, which can be from 300 to 56,000 bits per second (bps). Must be in V.90 increments.
any	Any minimum or maximum speed.
modulation *value*	(Optional) Maximum negotiated speed. Replace the *value* argument with one of the following choices: **any**, **k56flex**, **v22bis**, **v34**, or **v90**.

Defaults

No modem service parameters are defined by default. Any default services provided by the modems will be available.

Command Modes

Service profile configuration

Command History

Release	Modification
12.0(4)XI	This command was introduced.

Examples

The following example shows the modem service parameters for the service profile named user1sample configured for a minimum speed of **any**, a maximum speed of **any**, and a modulation of **k56flex**.

```
resource-pool profile service user1sample
 modem min-speed any max-speed any modulation k56flex
```

modem poll retry

To set the maximum number of polling attempts used to retrieve performance statistics from a modem installed in an access server or router, use the **modem poll retry** command in global configuration mode. To change or remove the polling attempts, use the **no** form of the command.

modem poll retry *polling-attempts*

no modem poll retry *polling-attempts*

Syntax Description

polling-attempts	Maximum number of polling attempts. The configuration range is from 0 to 10 attempts, and the default is 3.

Defaults

Three polling attempts

Command Modes

Global configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Higher settings cause the software to keep polling one modem for status and to avoid polling other modems, which decreases the amount of statistics that are gathered.

Note This command does not apply to basic modems that have out-of-band ports.

Examples

The following example configures the server to attempt to retrieve statistics from a local modem up to five times before discontinuing the polling effort:

```
modem poll retry 5
```

Related Commands

Command	Description
clear modem	Resets the hardware for one or more manageable modems on access servers and routers.
modem poll time	Sets the time interval between modem polls, which are used to periodically retrieve and report modem statistics.
modem status-poll	Polls for modem statistics through the out-of-band feature of a modem.

modem poll time

To set the time interval between modem polls, which are used to periodically retrieve and report modem statistics, use the **modem poll time** command in global configuration mode. To restore the 12-second default setting, use the **no** form of this command.

modem poll time *interval*

no modem poll time *interval*

Syntax Description

interval	Interval, in seconds, between polls. The configuration range is from 2 to 120 seconds, and the default is 12 seconds.

Defaults

12 seconds

Command Modes

Global configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command does not apply to basic modems, which do not have out-of-band ports.

Examples

The following example sets the time interval between polls to 10 seconds:

```
modem poll time 10
```

Related Commands

Command	Description
modem min-speed max-speed	Sets the maximum number of polling attempts used to retrieve performance statistics from a modem installed in an access server or router.
modem status-poll	Polls for modem statistics through the out-of-band feature of a modem.

modem-pool

To create a new modem pool or to specify an existing modem pool, use the **modem-pool** command in global configuration mode. To delete a modem pool from the access server configuration, use the **no** form of this command.

modem-pool *name*

no modem-pool *name*

Syntax Description

name	Name of a modem pool.

Defaults

All modems are configured to be part of one system default modem pool (displayed as System-def-Mpool by the **show modem-pool** command.). For example, if you have 120 MICA technologies modems loaded in your access server, 120 modems are in the default modem pool.

Command Modes

Global configuration

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

Modem pools enable you to physically partition or virtually partition your access server for dial-in and dial-out access.

Physical partitioning makes one access server appear as if it is multiple access servers loaded with different types of modem services (for example, v.34 modems, fax capable modems, and point-of-sale (POS) modems). Each service is part of one modem pool and assigned a unique Dialed Number Information Service (DNIS) number.

Virtual partitioning creates one large modem pool on the access server, but enables different customers to dial in and share the modem resources. Each customer is assigned its own DNIS number. Each customer is given overflow protection, which guarantees a certain number of simultaneous connections.

Note MICA and Microcom modems support incoming analog calls over ISDN PRI. However, only MICA technologies modems support modem pooling for CT1 and CE1 configurations with channel-associated signaling.

Examples

The following example creates a modem pool called v90service. After the **modem-pool v90service** command is issued, modem pool configuration mode is accessed and the router prompt changes.

```
modem-pool v90service
```

Related Commands

Command	Description
called-number (modem pool)	Assigns a called party number to a pool of modems.
clear modempool-counters	Clears active or running counters associated with one or more modem pools.
pool-member	Assigns a range of modems to a modem pool.
show modem-pool	Displays the configuration and connection status for one or more modem pools.

modem printer

To configure a line to require receipt of a data set ready (DSR) modem control signal, use the **modem printer** command in line configuration mode. To require the clear to send (CTS) modem control signal instead, use the **no** form of this command.

modem printer [delay]

no modem printer [delay]

Syntax Description

delay	(Optional) Causes router to delay assertion of the data terminal ready (DTR) signal until a network connection has been established.

Defaults

The modem requires the CTS signal. Hardware flow control cannot be configured concurrently.

Command Modes

Line configuration

Command History

Release	Modification
11.1	This command was introduced.
12.2(15)T	Support was added for the **delay** keyword.

Usage Guidelines

Use the **modem printer** command to set DSR as the modem control signal, leaving the CTS signal free for use with hardware flow control. This allows hardware flow control to be configured concurrently.

Although the **modem dialin** command supports modems concurrently with hardware flow control, the other auxiliary modem control options for printers, such as **modem cts-required**, use CTS instead of DSR/carrier detect (CD), as the CD signal.

Examples

The following example configures a line to send a DSR signal to the modem:

```
Router(config)# line 5
Router(config-line)# modem printer
```

Related Commands

Command	Description
flowcontrol	Sets the method of data flow control between the router and a terminal or other serial device.
modem always-on	Sets a tty line to always be ready to interpret characters from network elements.
modem dialin	Configures a line to enable a modem attached to the router to accept incoming calls only.

modem recovery action

To specify a modem recovery action, use the **modem recovery action** command in global configuration mode. To turn the modem recovery action off, use the **no** form of this command.

modem recovery action {**disable** | **download** | **none**}

no modem recovery action

Syntax Description

disable	Marks the modem bad.
download	Recovers by firmware download (default). Sets the modem into a recovery pending state, thus stopping the modem from accepting new calls.
none	Does not try to recover. Ignores the recovery threshold and just keeps running.

Defaults

The default setting is **download**.

Command Modes

Global configuration

Command History

Release	Modification
12.0	This command was introduced.
12.1(2.3)T	This command was no longer supported on Cisco AS5800 platforms.

Usage Guidelines

MICA technologies portware is downloaded on a modular basis and not on a modem basis. Thus, reloading MICA portware requires all 6 or 12 modems in a module to be reloaded.

Note Beginning with Cisco IOS Release 12.1(2.3)T1, the **modem recovery action** command is no longer supported for MICA technologies modems on the Cisco AS5800 platforms. To specify a modem recovery action for MICA technologies modems on the Cisco AS5800 platforms, use the **spe recovery** command.

After a modem has been deemed faulty, the configured action will take place on the modem. The following choices are possible: **disable**, **download**, and **none**.

Examples

The following example sets the recovery action to mark the modem as bad:

```
modem recovery action disable
```

Related Commands

Command	Description
modem recovery maintenance	Specifies the scheduled modem maintenance recovery behavior.
modem recovery threshold	Specifies the threshold, which starts the modem recovery process.
modem recovery-time	Sets the maximum amount of time the call-switching module waits for a local modem to respond to a request before it is considered locked in a suspended state.

modem recovery maintenance

To specify the modem maintenance recovery behavior, use the **modem recovery maintenance** command in global configuration mode. To change or turn off this behavior, use the **no** form of this command.

modem recovery maintenance {**action** {**disable** | **drop-call** | **reschedule**} | **max-download** *recovery-downloads* | **schedule** {**immediate** | **pending**} | **time** *hh*:*mm* | **window** *minutes*}

no modem recovery maintenance

Syntax Description

action	Mode of recovery. The default is set to **reschedule**.
disable	Marks the modem bad. Marks the originally faulty modem as bad and returns all other modems back into service.
drop-call	Forces firmware download by dropping holding calls. This action forces the recovery by dropping any active calls remaining on modems within the module.
reschedule	Reschedules firmware download to next maintenance time. Leaves the originally faulty modem as needing recovery and returns all other modems into service. Recovery will be attempted again on the following day. The default is set to **reschedule**.
max-download *recovery-downloads*	Maximum simultaneous recovery downloads. You must choose one number from 1 to 30. A range of values is not supported.
schedule	Scheduling method for modem recovery. Determines if the system should attempt module recovery as soon as a problem is found or wait for the maintenance window.
immediate	Immediately attempts modem recovery.
pending	Delays recovery until maintenance time (default).
time *hh*:*mm*	Time of day for scheduled modem recovery, in hours and minutes. This is the actual time of day when the modem recovery maintenance process wakes up and starts recovering MICA technologies modems. The default time is 3:00 a.m.
window *minutes*	Amount of time for normal recovery to take place. This is the delay timer in minutes, which is from 0 to 360.

Defaults

The default mode of recovery (**action**) is set to **reschedule**.
The default schedule is set to **pending**.
The default **time** for scheduled modem recovery is 3:00 a.m.

Command Modes

Global configuration

Command History

Release	Modification
12.0	This command was introduced.
12.1(2.3)T1	This command was no longer supported on Cisco AS5800 platforms.

Usage Guidelines

MICA portware is downloaded on a modular basis and not on a modem basis. Thus, reloading MICA portware requires all 6 or 12 modems in a module to be reloaded.

Note Beginning with Cisco IOS Release 12.1(2.3)T1, the **modem recovery maintenance** command is no longer supported for MICA technologies modems on the Cisco AS5800 platforms. To specify a modem recovery action for MICA technologies modems on the Cisco AS5800 platforms, use the **spe recovery** command.

Every 24 hours, the modem recovery maintenance process will wake up and attempt to recover any modems that are in the pending recovery state.

When a MICA module attempts to reload its portware, it must avoid taking down any modem connections that may exist. As such, the recovery process sets all modems currently not in use to recovery pending state. If any modems on the module are active, the recovery process waits for the calls to terminate normally. To avoid capacity problems from attempting recovery for an excessively long time period, a maintenance window is configured to require the modem recovery to take place within a specific timeframe. Otherwise, a given action is performed on that module when the window expires. The default window is 60 minutes. This behavior is set using the **modem recovery maintenance window** *minutes* command.

When the modem recovery maintenance window expires, one of the following actions is performed on the modem module awaiting recovery: **disable**, **reschedule**, or **drop-call**. The **disable** option is associated with the **modem recovery action** command.

When the modem recovery maintenance process starts, it attempts to recover all modems in the recovery pending state. This attempt can be on all modules on a given system. Thus, to avoid taking down all modems on a given system, only a maximum of simultaneous module recoveries can take place. The default is dynamically calculated to be 20 percent of the modules on a given system. This configuration allows that value to be overridden. These options are associated with the **modem recovery maintenance max-download** command.

Examples

The following examples show the available options for this command:

```
Router(config)# modem recovery maintenance ?

  action        Mode of recovery
  max-download  Maximum simultaneous recovery downloads
  schedule      Scheduling method for modem recovery
  time          Time of day for scheduled modem recovery
  window        Amount of time for normal recovery to take place

Router(config)# modem recovery maintenance action ?

  disable     Mark the modem bad
  drop-call   Force firmware download by dropping holding calls
  reschedule  Reschedule firmware download to next maintenance time

Router(config)# modem recovery maintenance max-download ?

  <1-30>  Number of MICA modules which can be simultaneously recovered

Router(config)# modem recovery maintenance schedule ?
  immediate  Attempt recovery immediately
  pending    Delay recovery until maintenance time
```

The following example shows how to set modem recovery maintenance to start immediately:

```
modem recovery maintenance schedule immediate
```

Related Commands

Command	Description
modem recovery action	Specifies the modem recovery mode when a modem has been identified as faulty.
modem recovery threshold	Specifies the threshold, which starts the modem recovery process.
modem recovery-time	Sets the maximum amount of time the call-switching module waits for a local modem to respond to a request before it is considered locked in a suspended state.

modem recovery threshold

To specify a failed call threshold that starts the modem recovery process, use the **modem recovery threshold** command in global configuration mode. To disable the threshold value, use the **no** form of this command.

modem recovery threshold *failed-calls*

no modem recovery threshold

Syntax Description

failed-calls	Number of consecutive call attempts that fail to queue up before the modem is deemed faulty, in the range from 1 to 1000.

Defaults

30 call attempts are enabled by default.

Command Modes

Global configuration

Command History

Release	Modification
12.0	This command was introduced.
12.1(2.3)T1	This command was no longer supported on Cisco AS5800 platforms.

Usage Guidelines

MICA technologies portware is downloaded on a modular basis and not on a modem basis. Thus, reloading MICA portware requires all 6 or 12 modems in a module to be reloaded.

Note Beginning with Cisco IOS Release 12.1(2.3)T1, the **modem recovery threshold** command is no longer supported for MICA technologies modems on the Cisco AS5800 platforms. To specify a modem recovery action for MICA technologies modems on the Cisco AS5800 platforms, use the **spe recovery** command.

Examples

The following example shows how to set the modem recovery threshold to 12 failed calls:

```
modem recovery threshold 12
```

Related Commands

Command	Description
modem recovery action	Specifies the modem recovery mode when a modem has been identified as faulty.
modem recovery maintenance	Specifies the scheduled modem maintenance recovery behavior.
modem recovery-time	Sets the maximum amount of time the call-switching module waits for a local modem to respond to a request before it is considered locked in a suspended state.

modem recovery-time

To set the maximum amount of time the call-switching module waits for a local modem to respond to a request before it is considered locked in a suspended state, use the **modem recovery-time** command in global configuration mode. To set a 5-minute response time, which is the default setting, use the **no** form of this command.

modem recovery-time *response-time*

no modem recovery-time

Syntax Description

response-time	Maximum amount of time, in minutes, for which local modems wait for a response; default is 5 minutes.

Defaults

5 minutes

Command Modes

Global configuration

Command History

Release	Modification
11.2	This command was introduced.
12.1(2.3)T	This command was no longer supported on Cisco AS5800 platforms.

Usage Guidelines

This command does not apply to basic modems that do not have out-of-band ports.

After the call-switching module resets a suspended modem, it recovers to a default call switching module state.

Note Beginning with Cisco IOS Release 12.1(2.3)T, the **modem recovery-time command** is no longer supported for MICA technologies modems on the Cisco AS5800 platforms. To specify a modem recovery action for MICA technologies modems on the Cisco AS5800 platforms, use the **spe recovery** command.

Examples

The following example configures the call-switching module to wait for 8 minutes:

```
modem recovery-time 8
```

Related Commands

Command	Description
modem recovery action	Specifies the modem recovery mode when a modem has been identified as faulty.
modem recovery maintenance	Specifies the scheduled modem maintenance recovery behavior.
modem recovery threshold	Specifies the threshold, which starts the modem recovery process.

modem ri-is-cd

The **modem ri-is-cd** command is replaced by the **modem dialin** command. See the description of the **modem dialin** command for more information.

modem shutdown

To abruptly shut down an active or idle modem installed in an access server or router, use the **modem shutdown** command in line configuration mode. To take the modem out of a shutdown state and place it back in service, use the **no** form of this command.

modem shutdown

no modem shutdown

Syntax Description

This command has no arguments or keywords.

Defaults

Command is disabled.

Command Modes

Line configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Enable the **no modem shutdown** command to restore to service a modem that has been shut down.

Examples

The following example abruptly shuts down the modem associated with line 1/0/6. All active calls on the modem are dropped immediately.

```
line 1/0/6
 modem shutdown
```

The following example abruptly shuts down a range of modems:

```
line 1/0/5 1/0/72
 modem shutdown
```

The following example abruptly shuts down the modem associated with line 2 on a Cisco AS5300. All active calls on the modem are dropped immediately.

```
 line 2
  modem shutdown
```

Related Commands

Command	Description
modem busyout	Disables a modem from dialing or answering calls whereby the disabling action is not executed until the active modem returns to an idle state.

modem startup-test

Support for the **modem startup-test** command was removed in Cisco IOS Release 12.2(11)T. The use of this command is not recommended. In most cases, nonfunctional integrated modems will automatically be removed from service by the system. See the **modem recovery action** command and the **spe recovery** command for more configuration options for nonfunctional modems. For further information about MICA modem recovery, refer to the *Configuring MICA Modem Recovery* technical note. For further information about NextPort service processing element (SPE) recovery, refer to the *Configuring NextPort SPE Recovery* technical note.

modem status-poll

To poll for modem statistics through a modem's out-of-band feature, use the **modem status-poll** command in line configuration mode. To disable status polling through the out-of-band feature for a specified modem, use the **no** form of this command.

modem status-poll

no modem status-poll

Syntax Description

This command has no arguments or keywords.

Defaults

Command is enabled.

Command Modes

Line configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command applies only to manageable modems that have out-of-band ports.

Note This command does not apply to basic modems that have out-of-band ports.

Examples

The following example enables modem status polling through TTY line 1:

```
line 1
 modem status-poll
```

Related Commands

Command	Description
modem min-speed max-speed	Sets the maximum number of polling attempts used to retrieve performance statistics from a modem installed in an access server or router.
modem poll time	Sets the time interval between modem polls, which are used to periodically retrieve and report modem statistics.

modemcap edit

To change a modem value that was returned from the **show modemcap** command, use the **modemcap edit** command in global configuration mode.

modemcap edit *modem-name attribute at-command*

Syntax Description

modem-name	Name of the modem whose values are being edited.
attribute	Modem capability, or attribute, as defined by the **show modemcap** command.
at-command	The AT command equivalent (such as **&F**).

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Modemcaps are printed within the configuration file. You can edit them using this command.

Configure one attribute of one modem at a time. See the modem-capability values defined by the **show modemcap** command.

Examples

The following example adds the factory default entry, **&F**, to the configuration file. This entry and others like it are stored in a database that is referenced by the configuration file.

```
modemcap edit codex_3250 factory-default &F
```

Related Commands

Command	Description
modemcap entry	Stores and compresses information about the capability of a specified modem.
show modemcap	Displays the values set for the current modem and lists the modems for which the router has entries.

modemcap entry

To store and compress information about the capability of a specified modem, use the **modemcap entry** command in global configuration mode. To disable this feature, use the **no** form of this command.

modemcap entry *modem-type*

no modemcap entry *modem-type*

Syntax Description

modem-type	Type of supported modem as specified in Table 18.

Defaults

The capability values that exist in the specified modem at the time that the command is issued

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.
12.1(5)T	This command was implemented on the Cisco 2600 series and the Cisco 3600 series.

Usage Guidelines

This command displays the capability of the specified modem. Modemcaps are printed within the configuration file and are intended to be edited using the **modemcap edit** command. The **modemcap entry** command does not display values that are not set in the modem.

Use the **modemcap entry** command with the **show modemcap** command to interpret the capability of the specified modem. Table 18 lists the modemcap entries for supported modems.

Table 18 Modemcap Entries for Supported Modems

Modemcap Name	Modem Type
External Modems	
codex_3260	Motorola Codex 3260
default	Generic “Hayes” interface
global_village	Global Village Teleport
hayes_optima	Hayes Optima[1]
nec_piafs	NEC PIAFS TA
nec_v34	NEC V.34
nec_v110	NEC V.110 TA
telebit_t3000	Telebit T3000
usr_courier	U.S. Robotics Courier
usr_sportster	U.S. Robotics Sportster

Table 18 Modemcap Entries for Supported Modems (continued)

Modemcap Name	Modem Type
viva	Viva (Rockwell ACF with MNP)
Internal Modems	
cisco_v110	Cisco (NEC) internal V.110 TA (AS5200)
mica	Cisco MICA HMM/DMM digital
microcom_hdms	Microcom HDMS chassis
microcom_mimic	Cisco (Microcom) analog (NM-AM-2600/3600)
microcom_server	Cisco (Microcom) V.34/56K digital (AS5300)
nextport	Cisco NextPort CSMV/6 digital

1. This built-in modemcap is not recommended for use on an Optima because it sets the modem to automatic speed buffering. This modemcap disables error control and may result in poor performance. Instead, use modemcap **default.**

Examples

The following example shows how to select a U.S. Robotics Sportster modem type:

```
modemcap entry usr_sportster
```

Related Commands

Command	Description
modem hold-reset	Resets and isolates integrated modems for extensive troubleshooting.
show modemcap	Displays the values set for the current modem and lists the modems for which the router has entries.

modemui

To enter Cisco modem user interface mode and enter Hayes-compatible modem commands, use the **modemui** command in EXEC mode.

modemui [*modem-commands*]

Syntax Description

modem-commands	(Optional) Hayes-compatible modem commands. Table 19 lists the modem commands supported on Cisco routers. Multiple commands may be entered.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.2(4)T	This command was introduced.

Usage Guidelines

Use the **modemui** command to enter interactive Cisco modem user interface mode, which allows the Hayes-compatible modem command subset listed in Table 19 to be entered.

The **modemui** EXEC command can also be entered with the **autocommand** line configuration command to configure the Cisco modem user interface feature as part of line configuration.

Note Before entering the modem command that dials the modem telephone number, you must map the telephone number to an appropriate IP host using the Cisco IOS **ip host** global configuration command.

Table 19 Cisco-Supported Hayes Modem Commands

Hayes Modem Commands	Description
AT	Attention command. Enters modem command execution mode. You can add any of the command settings listed in this table to the **AT** command.
DT*string* **DP***string*	Dials outbound tone (**T**) or pulse (**P**) call. The string following the **T** or **P** character is used as an argument to the Cisco IOS **connect** EXEC command. Before dialing, you must set up an appropriate IP host using the Cisco IOS **ip host** global configuration command. For example: `ip host t555-1212 4023 10.0.0.51` Valid characters for *string* are the same as the characters that are used in a host name for the Cisco IOS **connect** command, as follows: • The numbers 0 through 9 • Uppercase letters A through Z • Lowercase letters a through z • The . (period), - (hyphen), and _ (underscore) characters No other characters (such as # or *) are accepted in the dial string, and unsupported characters are stripped before dialing occurs.
E*n*	Echo mode. Values for *n* are as follows: • 0 turns off command echo. • 1 turns on command echo (default).
H*n*	Hangup mode. A value of 0 or 1 closes the connection.
I*n*	Information mode. The information displayed is set in a banner configured with the Cisco IOS **MODEMUI-VERSION** global configuration command. Acceptable values for *n* are the numbers 0 through 6.
O*n*	Online mode. A value of 0 or 1 resumes the connection.
Q*n*	Quiet mode. Values for *n* are as follows: • 0 displays modem result codes (default). • 1 inhibits modem result codes display (quiet mode).
S*n*=*v*	Set selected register (S-register). **Note** The standard Hayes modem S-register settings S0 through S53 are accepted by Cisco IOS software, but do not have any effect. Choose one of the following S-registers for *n*: • S201—Command mode parity sniffing. If the value (*v*) for S201 is 0 (default), parity for both the command and data portions of a call are controlled by the Cisco IOS **parity** and **databits** line configuration commands. If the value (*v*) for S201 is 1, mark or space parity for the command session will be taken from the Hayes **AT** part of the command, and the data portion will be 8-bit transparent.

Table 19 Cisco-Supported Hayes Modem Commands (continued)

Hayes Modem Commands	Description
	• S202—Output mask. This setting allows mark parity to be unconditionally implemented for the command characters. The default value for S202 is 0 (no parity). The value 128 causes command characters to be sent with mark parity. • S203—Connect delay. Allows a delay in seconds to be added to the time between when the **ATD** command is executed and when the call success or failure code is displayed. This delay is sometimes required because a Telnet connection is established more quickly than placing a telephone call. The value for S203 can be a number from 0 to 255. The actual value applied to the connect delay is 10 percent of the number entered for *v*. For example, a value of 300 sets a connect delay of 30 seconds. The default value is 0. • S204—Connect code. Allows the result code for a successful connection to be specified. The default is code 1 for the unextended mode, but you can configure one of the following numbers to display a selected line speed. For example, connection code 10 selects CONNECT 2400. By allowing the code to be expressed explicitly, you can allow for a "CONNECT 2400" response message to be displayed, regardless of the actual line speed. The default for *v* is 0, or choose one of the following connection codes: – 9—CONNECT 1200 – 10—CONNECT 2400 – 11—CONNECT 4800 – 12—CONNECT 9600 – 13—CONNECT 14400 – 14—CONNECT 19200 – 15—CONNECT 38400 – 16—CONNECT 57600
S*n*?	S-register query. The value for *n* is the number of the S-register to query (S201 through S204; see the preceding list).
V*n*	Result code format. Values for *n* are as follows: • 0 displays a short result report. • 1 displays a long result report (default).
X*n*	Extended result codes. The value for *n* is any nonzero number, which appends /NONE to the connect message. Also see the preceding description for S-register S204, for changing the reported connection speed.
Z **Z99**	Reset to default configuration. Choose one of the following reset options: • **ATZ** returns the Cisco modem user interface to its default state and re-executes the initialization string provided in the **modemui** command. • **ATZ99** returns to the standard Cisco IOS software user interface (EXEC) mode.

Examples

The following example shows how to configure a line for the Cisco modem user interface feature and set the modem in no-echo, short-response mode:

```
line aux 0
 login authentication modem
 modem dialin delay
 autocommand modemui ATE0V0
 transport input all
 stopbits 1
 speed 38400
 flowcontrol hardware
```

The following example shows how to enter Cisco modem user interface mode from the Cisco IOS EXEC mode and enter Hayes-compatible **AT** commands to dial and test the modem:

```
Router# modemui
AT
OK
ATDT4155551234
CONNECT
User Access Verification
Username:
```

Related Commands

Command	Description
autocommand	Configures the Cisco IOS software to automatically execute a command when a user connects to a particular line.
connect	Logs in to a host that supports Telnet, rlogin, or LAT.
ip host	Defines a static host name-to-address mapping in the host cache.
modemui-version	Displays a banner in response to the Hayes information mode command.

modemui-version

To display a banner as a response to the Hayes modem information command, use the **modemui-version** command in global configuration mode. To remove or change the banner display, use the **no** form of this command.

modemui-version *delimiter banner-text delimiter*

no modemui-version *delimiter banner-text delimiter*

Syntax Description

delimiter	Character that you choose, such as # or /, to signal the beginning and end of the banner message.
banner-text	Banner message text.

Defaults

No default behavior or values.

Command Modes

Global configuration

Command History

Release	Modification
12.2(4)T	This command was introduced.

Usage Guidelines

Use the **modemui-version** command to configure banners for the Hayes information mode command *(***ATI***n)*.

Examples

The following example configures the modem user interface banner to display the modem model and code revision in response to the **ATI6** Cisco modem user interface command:

```
modemui-version / Telebit T3000, Version 1.5 /
```

Related Commands

Command	Description
modemui	Enters Cisco modem user interface mode.

multihop-hostname

To enable a tunnel switch to initiate a tunnel based on the hostname or tunnel ID associated with an ingress tunnel, use the **multihop-hostname** command in VPDN request-dialin subgroup configuration mode. To disable this option, use the **no** form of this command.

multihop-hostname *ingress-tunnel-name*

no multihop-hostname *ingress-tunnel-name*

Syntax Description

ingress-tunnel-name	Network access server (NAS) hostname or ingress tunnel ID.

Command Default

No multihop hostname is configured.

Command Modes

VPDN request-dialin subgroup configuration

Command History

Release	Modification
12.1(1)DC1	This command was introduced on the Cisco 6400 node route processor (NRP).
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Usage Guidelines

Use the **multihop-hostname** command only on a device configured as a tunnel switch.

The *ingress-tunnel-name* argument must specify either the hostname of the device initiating the tunnel that is to be to be switched, or the tunnel ID of the ingress tunnel that is to be switched.

Removing the request-dialin subgroup configuration will remove the **multihop-hostname** configuration.

Examples

The following example configures a Layer 2 Tunnel Protocol (L2TP) virtual private dialup network (VPDN) group on a tunnel switch to forward ingress sessions from the host named LAC-1 through an outgoing tunnel to IP address 10.3.3.3:

```
vpdn-group 11
 request-dialin
  protocol l2tp
  multihop-hostname LAC-1
 initiate-to ip 10.3.3.3
 local name tunnel-switch
```

Related Commands

Command	Description
domain	Requests that PPP calls from a specific domain name be tunneled, and supports additional domain names for a specific VPDN group.
dnis	Configures a VPDN group to tunnel calls from the specified DNIS, and supports additional domain names for a specific VPDN group.
vpdn multihop	Enables VPDN multihop.
request-dialin	Creates a request dial-in VPDN subgroup that configures a NAS to request the establishment of a dial-in tunnel to a tunnel server, and enters request dial-in VPDN subgroup configuration mode.
vpdn search order	Specifies how the NAS is to perform VPDN tunnel authorization searches.

multilink

To limit the total number multilink PPP (MLP) sessions for all virtual private dialup network (VPDN) multilink users, enter the **multilink** command in VPDN group configuration mode. To remove the MLP session limit, enter the **no** form of this command.

multilink {**bundle** *bundles* | **link** *links*}

no multilink {**bundle** *bundles* | **link** *links*}

Syntax Description

bundle *bundles*	Configures the number of MLP bundles supported for a VPDN group. In general, each user requires one bundle. Valid values for the *bundles* argument range from 0 to 32,767.
link *links*	Configures the number of sessions supported for each bundle. Valid values for the links argument range from 0 to 32,767.

Command Default

No MLP session limit is set.

Command Modes

VPDN group configuration

Command History

Release	Modification
12.0(4)XI	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T.

Usage Guidelines

Use the **multilink** VPDN group configuration command to limit the total number of sessions for all MLP users. Each user requires one bundle, regardless if the user is a remote modem client or an ISDN client.

One modem client using one B channel requires one link. One ISDN BRI node may require up to two links for one BRI line connection. The second B channel of an ISDN BRI node comes up when the maximum threshold is exceeded.

Examples

The following example configures a VPDN group called group1 to initiate Layer 2 Tunnel Protocol (L2TP) tunnels to the tunnel server at IP address 10.2.2.2. Ten MLP bundles are configured for users that dial in to the domain cisco.com. Each bundle is configured to support a maximum of 5 links, limiting the total number of MLP sessions to 50.

```
Router(config)# vpdn-group group1
Router(config-vpdn)# request-dialin
Router(config-vpdn-req-in)# protocol l2tp
Router(config-vpdn-req-in)# domain cisco.com
Router(config-vpdn-req-in)# exit
Router(config-vpdn)# initiate-to ip 10.2.2.2
Router(config-vpdn)# multilink bundle 10
Router(config-vpdn)# multilink link 5
```

Related Commands

Command	Description
request-dialin	Creates a request dial-in VPDN subgroup that configures a NAS to request the establishment of a dial-in tunnel to a tunnel server, and enters request dial-in VPDN subgroup configuration mode.
vpdn-group	Creates a VPDN group and enters VPDN group configuration mode.

multilink bundle-name

To select a method for naming multilink bundles, use the **multilink bundle-name** command in global configuration mode. To remove the selection method, use the **no** form of this command.

multilink bundle-name {**authenticated** | **endpoint** | **both**}

no multilink bundle-name {**authenticated** | **endpoint** | **both**}

Syntax Description

authenticated	Authenticated name of the peer. This is the default.
endpoint	Endpoint discriminator of the peer.
both	Authenticated name and endpoint discriminator of the peer.

Defaults

Authenticated name of the peer.

Command Modes

Global configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

The **authenticated** keyword defines the selection criteria for the bundle name as the authenticated name, the endpoint discriminator if the link is not authenticated, or the caller ID if neither an authenticated name nor an endpoint is supplied.

The **endpoint** keyword defines the selection criteria for the bundle name as the endpoint discriminator, the authenticated name if no endpoint is supplied, or the caller ID if neither an authenticated name nor an endpoint is supplied.

The **both** keyword defines the selection criteria for the bundle name as an authenticated name-endpoint discriminator pair, the authenticated name if no endpoint is supplied, the endpoint discriminator if the link is not authenticated, or the caller ID if neither an authenticated name nor an endpoint is supplied.

Examples

The following example sets the selection criteria for the multilink bundle name as the endpoint discriminator:

```
multilink bundle-name endpoint
```

multilink-group

The **multilink-group** command is replaced by the **ppp multilink group** command. See the description of the **ppp multilink group** command for more information.

multilink max-fragments

The **multilink max-fragments** command is replaced by the **ppp multilink fragment maximum** command. See the description of the **ppp multilink fragment maximum** command for more information.

multilink virtual-template

To specify a virtual template from which the specified Multilink PPP (MLP) bundle interface can clone its interface parameters, use the **multilink virtual-template** command in global configuration mode. To remove the defined virtual template, use the **no** form of the command.

multilink virtual-template *number*

no multilink virtual-template *number*

Syntax Description

number	Number of virtual templates. An integer in the range from 1 to the largest number of virtual templates the software image supports (typically 25).

Defaults

No template number is defined.

Command Modes

Global configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Configuring a specific IP address in a virtual template can result in the establishment of erroneous routes and the loss of IP packets.

Examples

The following example specifies an MLP virtual template to be used and then defines the template to be applied to an MLP bundle interface:

```
multilink virtual-template 1
interface virtual-template 1
 ip unnumbered ethernet 0
 encapsulation ppp
 ppp multilink
 ppp authentication chap
```

Related Commands

Command	Description
interface virtual-template	Creates a virtual template interface that can be configured and applied dynamically in creating virtual access interfaces.