

# lcp renegotiation

To allow the L2TP Network Server (LNS) to renegotiate the Link Control Protocol (LCP) on dial-in calls, using Layer 2 Tunneling Protocol (L2TP) or Layer 2 Forwarding (L2F), use the **lcp renegotiation** command in VPDN group configuration mode. To remove LCP renegotiation, use the **no** form of this command.

**lcp renegotiation** { **always** | **on-mismatch** }

**no lcp renegotiation**

Syntax Description	always	Always renegotiates PPP LCP at the LNS.
	<b>on-mismatch</b>	Renegotiates PPP LCP at the LNS only in the event of an LCP mismatch between the LAC and LNS.

**Defaults** LCP renegotiation is disabled on the LNS.

**Command Modes** VPDN group configuration

Command History	Release	Modification
	11.3(5)AA	This command was introduced.
	12.0(1)T	This command was migrated to Release 12.0(1)T.
	12.0(5)T	This command was modified to only be available if the accept-dialin VPDN subgroup is enabled.

**Usage Guidelines** You must enable the **accept-dialin** command on the VPDN group before you can use the **lcp renegotiation** command. Removing the **accept-dialin** command will remove the **lcp renegotiation** command from the VPDN group.

This command is only valid at the LNS. This command is useful for an LNS that tunnels to a non-Cisco LAC, where the LAC may negotiate a different set of LCP options than what the LNS expects.

When a PPP session is started at the LAC, LCP parameters are negotiated, and a tunnel initiated, the LNS can either accept the LAC LCP negotiations or can request LCP renegotiation. Using the **lcp renegotiation always** command forces renegotiation to occur at the LNS. If the **lcp renegotiation on-mismatch** command is configured, then renegotiation will only occur if there is an LCP mismatch between the LNS and LAC.



**Note**

Older PC PPP clients may experience a “lock up” during PPP LCP renegotiation.

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**Examples**

The following example configures the LNS to renegotiate PPP LCP with a non-Cisco LAC:

```
vpdn-group 1
  accept dialin
  protocol l2tp
  virtual-template 1
  terminate-from pat
  lcp renegotiation on-mismatch
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>accept dialin</b>	Specifies the LNS to use for authenticating, and the virtual template to use for cloning, new virtual access interfaces when an incoming L2TP tunnel connection is requested from a specific peer.
<b>force-local-chap</b>	Forces the LNS to reauthenticate the client.

# limit base-size

To define the base number of simultaneous connections that can be done in a single customer or Virtual Private Dialup Network (VPDN) profile, use the **limit base-size** command in customer profile configuration mode or VPDN profile configuration mode. Use the **no** form of this command to remove the limitation.

**limit base-size** { *number* | **all** }

**no limit base-size** { *number* | **all** }

Syntax Description	
<i>number</i>	Sets the maximum number of simultaneous connections or sessions that can be used in a specified customer or VPDN profile.
<b>all</b>	Accepts all calls. Use this command if you don't want to limit or apply overflow session counting to a customer or VPDN profile.

**Defaults** No limits are set for a customer profile. The base size is set to **all**.

**Command Modes** Customer profile configuration/VPDN profile configuration

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

**Usage Guidelines** Use the **limit base-size** customer or VPDN profile configuration command to define the base number of simultaneous connections in a single customer or VPDN profile. The session limit applies to all the physical resource groups and pools configured in a single customer profile. If you want to define the number of overflow calls granted to a customer profile by using the **limit overflow-size** command, do *not* set the **limit base-size** command to "all." Instead, specify a number for the **limit base-size** command.

**Examples** The following example shows the limits of the total number of simultaneous connections to a base size of 48:

```
resource-pool profile customer customer1_isp
limit base-size 48
```

Related Commands	Command	Description
	<b>resource-pool profile customer</b>	Creates a customer profile.
	<b>limit overflow-size</b>	Defines the number of overflow calls granted to one customer or VPDN profile.

# limit overflow-size

To define the number of overflow calls granted to one customer or Virtual Private Dialup Network (VPDN) profile, use the **limit overflow-size** command in customer profile configuration mode or VPDN profile configuration mode. Use the **no** form of this command to remove the overflow configuration.

**limit overflow-size** {*number* | **all**}

**no limit overflow-size** {*number* | **all**}

Syntax Description		
	<i>number</i>	Specifies the number of overflow calls.
	<b>all</b>	Allows an unlimited number of overflow calls.

**Defaults** The overflow size is set to 0.

**Command Modes** Customer profile configuration/VPDN profile configuration

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

**Usage Guidelines** Use the **limit overflow-size** customer or VPDN profile configuration command to define the number of overflow calls granted to one customer or VPDN profile. The overflow is not applied if the **limit base-size** command is set to “all.”

**Examples** The following example shows 20 overflow calls granted to the customer profile called customer1\_isp:

```
resource-pool profile customer customer1_isp
limit overflow-size 20
```

Related Commands	Command	Description
	<b>resource-pool profile customer</b>	Creates a customer profile.
	<b>limit base-size</b>	Defines the base number of simultaneous connections that can be done in a single customer or VPDN profile.

# line

To identify a specific line for configuration and begin the command in line configuration mode collection mode, use the **line** command in global configuration mode.

**line** [**aux** | **console** | **tty** | **vty**] *line-number* [*ending-line-number*]

Syntax Description		
<b>aux</b>	(Optional) Auxiliary EIA/TIA-232 DTE port. Must be addressed as relative line 0. The auxiliary port can be used for modem support and asynchronous connections.	
<b>console</b>	(Optional) Console terminal line. The console port is DCE.	
<b>tty</b>	(Optional) Standard asynchronous line.	
<b>vty</b>	(Optional) Virtual terminal for remote console access.	
<i>line-number</i>	The relative number of the terminal line (or the first line in a contiguous group) that you want to configure when the line type is specified. Numbering begins with zero.	
<i>ending-line-number</i>	(Optional) The relative number of the last line in a contiguous group that you want to configure. If you omit the keyword, then <i>line-number</i> and <i>ending-line-number</i> are absolute rather than relative line numbers.	

**Defaults** There is no default line.

**Command Modes** Global configuration

Command History	Release	Modification
	10.0	This command was introduced.

**Usage Guidelines** You can address a single line or a consecutive range of lines with the **line** command. A line number is necessary, though, and you will receive an error message if you forget to include it.

Entering the **line** command with the optional line type (**aux**, **console**, **tty**, or **vty**) designates the line number as a relative line number. For example, to configure line parameters for line 7 (a TTY line), you could enter the following:

```
line tty 7
```

You also can use the **line** command without specifying a line type. In this case, the line number is treated as an absolute line number. For example, to configure line parameters for line 5, which can be of any type, you could enter the following:

```
line 5
```

Absolute line numbers increment consecutively and can be difficult to manage on large systems. Relative line numbers are a shorthand notation used in configuration. Internally, the Cisco IOS software uses absolute line numbers. You cannot use relative line numbers everywhere, but you can use absolute line numbers everywhere.

The absolute line number of the auxiliary port is 1. The relative line number of the auxiliary port is 0. See the **modem** line configuration command to set up modem support on the auxiliary port.

The software keeps a table of absolute and relative line numbers that you can display with the EXEC command **show users all**. A sample display follows:

```
Router> show users all
  Line   User      Host(s)          Idle   Location
  0 con 0
  1 tty 1
  2 tty 2
  3 tty 3          DREGGS          1:07   Katy x1111
  4 tty 4
  5 tty 5
  6 tty 6
  7 tty 7          DREGGS          14    Marie x1112
 10 tty 10
. . .
135 tty 135
136 tty 136
137 tty 137
140 tty 140
141 aux 0
142 vty 0   Denise   idle            DENISE-MAC.CISCO.COM
143 vty 1   Michael idle            0 DREGGS.CISCO.COM
144 vty 2
145 vty 3
146 vty 4
147 vty 5
```

The absolute line numbers are listed at the far left, followed by the line type, and then the relative line number. Relative line numbers always begin numbering at zero and define the type of line. Addressing the second virtual terminal line as line VTY 1, for example, is easier than remembering it as line 143—its absolute line number.

The line types are ranked as follows in the line table:

1. Console 0 (con 0)
2. Standard asynchronous line (TTY)
3. Auxiliary port (aux)
4. Virtual terminal line (VTY)
5. Printer

The terminal from which you locally configure the router is attached to the console port. To configure line parameters for the console port, enter the following:

```
line con 0
```

The console relative line number must be 0.

Virtual terminal lines are used to allow remote access to the router. A virtual terminal line is not associated with either the auxiliary or console port. The router has five virtual terminal lines by default. However, you can create additional virtual terminal lines as described in the chapter “Configuring Protocol Translation and Virtual Asynchronous Devices” in the *Cisco IOS Dial Services Configuration Guide: Terminal Services*.

Configuring the console port or virtual terminal lines allows you to perform such tasks as setting communication parameters, specifying autobaud connections, and configuring terminal operating parameters for the terminal you are using.

### Examples

The following example starts configuration for virtual terminal lines 0 to 4:

```
line vty 0 4
```

In the following example, the user creates and configures the maximum 100 virtual terminal lines with the **no login** command:

```
line vty 0 99
no login
```

In the following example, the user eliminates virtual terminal line number 5 and all higher-numbered virtual terminal lines. Only virtual terminal lines 0 to 4 will remain.

```
no line vty 5
```

In the following example, the user configures console line 0, auxiliary line 0, and virtual terminal lines 0 to 4:

```
line vty 0 4
login
line con 0
password baskerville
line aux 0
password Mypassword
no exec
access-class 1 in
speed 19200
line vty 0
exec-timeout 0 0
password Mypassword
line vty 1
exec-timeout 0 0
password Mypassword
line vty 2
exec-timeout 0 0
password Mypassword
line vty 3
password Mypassword
line vty 4
password Mypassword
```

### Related Commands

Command	Description
<b>show line</b>	Displays the parameters of a terminal line.
<b>show users</b>	Displays information about the active lines on the router.

# line-power

To configure the Cisco MC3810 BRI port to supply line power to the terminal equipment (TE), use the **line-power** command in interface configuration mode. To disable the line power supply, use the **no** form of this command.

**line-power**

**no line-power**

## Syntax Description

This command has no arguments or keywords.

## Defaults

The BRI port does not supply line power.

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(3)XG	This command was introduced.

## Usage Guidelines

This command is supported only on the Cisco MC3810, and only if an installed BRI voice module (BVM) is equipped to supply line power (phantom power).

This command is used only on a BRI port operating in NT mode. A BRI port operating in TE mode is automatically disabled as a source of line power, and the **line-power** command is rejected.

When you use the **line-power** command, the line power provision is activated on a BRI port if the port is equipped with the hardware to supply line power. When you enter the **no line-power** command, the line power provision is deactivated on a BRI port.



### Note

If the BRI port is operating in NT mode, the **line-power** command will be accepted, but will have no effect if a BVM is not equipped to supply line power.

## Examples

The following example configures a BRI port to supply power to an attached TE device (only if the BVM is equipped to supply line power):

```
interface bri 1
 line-power
```

# link (RLM)

This command is a preference weighted multiple entries command. Within the same server, the link preference is specified in weighting. Use the **no** form of this command to disable this function.

**link** {**hostname** *name* | **address** *ip-address*} **source** *interface* **weight** *number*

**no link** {**hostname** *name* | **address** *ip-address*} **source** *interface* **weight** *number*

Syntax Description	Parameter	Description
	<b>hostname</b> <i>name</i>	If hostname is used, RLM will look up the DNS server periodically for the hostname configured until lookup is successful or the configuration is removed.
	<b>address</b> <i>ip-address</i>	IP address of the link.
	<b>source</b> <i>interface</i>	We recommend you use the loopback interface as the source, so that it is independent of the hardware condition. Also, the source interface should be different in every link to avoid falling back to the same routing path. If you intend to use the same routing path for the failover, a single link is sufficient to implement it.
	<b>weight</b> <i>number</i>	The higher the weighting number, the higher priority it gets to become the active link. If all entries have the same weighting, all links will be treated equally. There is no preference among servers according to the assumption that only one server will accept the connection requests at any given time. Otherwise, the preference will extend across all servers.

**Defaults** Disabled

**Command Modes** RLM configuration

Command History	Release	Modification
	11.3(7)	This command was introduced.

Related Commands	Command	Description
	<b>clear rlm group</b>	Clears all RLM group time stamps to zero.
	<b>clear interface</b>	Resets the hardware logic on an interface.
	<b>interface</b>	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
	<b>protocol rlm port</b>	Reconfigures the port number for the basic RLM connection for the whole rlm-group.
	<b>retry keepalive</b>	Allows consecutive keepalive failures a certain amount of time before the link is declared down.
	<b>server (RLM)</b>	Defines the IP addresses of the server.

<b>Command</b>	<b>Description</b>
<b>show rlm group statistics</b>	Displays the network latency of the RLM group.
<b>show rlm group status</b>	Displays the status of the RLM group.
<b>show rlm group timer</b>	Displays the current RLM group timer values.
<b>shutdown (RLM)</b>	Shuts down all of the links under the RLM group.
<b>timer</b>	Overwrites the default setting of timeout values.

# loadsharing

To configure endpoints for load sharing, use the **loadsharing** command in VPDN group configuration mode. To remove this function, use the **no** form of this command.

**loadsharing ip** *ip-address* [**limit** *number*]

**no loadsharing ip** *ip-address* [**limit** *number*]

<b>Syntax Description</b>	<b>ip</b> <i>ip-address</i>	IP address of the HGW/LNS at the other end of the tunnel. This is the IP endpoint at the end of the tunnel, which is a HGW/LNS router.
	<b>limit</b> <i>number</i>	(Optional) Limits sessions per load share. The limit has a range from 0 to 32,767 sessions. The default is no limit set.

**Defaults** This function is not used when not configured.

**Command Modes** VPDN group configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0(4)XI	This command was introduced.

**Usage Guidelines** Use the **loadsharing** VPDN group configuration command to configure endpoints for loadsharing.

**Examples** In the following example, one VPDN group called customer1-vpdng is created. L2TP IP traffic load is shared between two HGW/LNSs. The IP addresses for the HGW/LNS's WAN ports are 172.21.9.67 and 172.21.9.68. The characteristics for 172.21.9.67 are defined by using the **request dialin** command. The characteristics for 172.21.9.68 are defined by using the **loadsharing** command.

A backup home-gateway router is specified at 172.21.9.69 by using the **backup** command. This router serves as a backup device for two load-sharing HGW/LNS:

```
!
vpdn-group customer1-vpdng
 request dialin l2tp ip 172.21.9.67 domain cisco.com
 loadsharing ip 172.21.9.68 limit 100
 backup ip 172.21.9.69 priority 5
 domain cisco2.com
!
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>request dialin</b>	Configures a VPDN group to request L2F or L2TP tunnels to a home gateway and creates a request-dialin VPDN subgroup.

# local name

To specify a local host name that the tunnel will use to identify itself, use the **local name** command in global configuration mode. To remove a local name, use the **no** form of this command.

**local name** *name*

**no local name** *name*

## Syntax Description

<i>name</i>	Local host name of the tunnel.
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## Defaults

Disabled. A local name must be explicitly configured.

## Command Modes

Global configuration

## Command History

Release	Modification
11.3(5)AA	This command was introduced.
12.0(1)T	This command was migrated to the T-train.

## Usage Guidelines

This command allows each VPDN group to use a unique and local name. The password hierarchy sequence that is used for tunnel identification and subsequently, tunnel authentication, is as follows:

- An L2TP tunnel password is used first (defined by the **l2tp tunnel password** command).
- If no L2TP tunnel password exists, the password associated with the local name is used.
- If a local name password does not exist, the password associated with the host name is used.

The **username** command is used to define the passwords associated with the local name and the host name.

## Examples

The following example configures the local host name of the tunnel as dustie:

```
local name dustie
```

## Related Commands

Command	Description
<b>hostname</b>	Specifies or modifies the host name for the network server.
<b>l2tp tunnel password</b>	Sets the password the router uses to authenticate the tunnel.
<b>terminate-from</b>	Specifies the host name of the remote LAC or LNS that will be required when accepting a VPDN tunnel.
<b>username</b>	Establishes a username-based authentication system, such as PPP CHAP and PAP.

# lock

To set up a temporary password on a line, use the **lock** command in EXEC mode.

**lock**

**Syntax Description** This command has no arguments or keywords.

**Command Modes** EXEC

Command History	Release	Modification
	10.0	This command was introduced in a release prior to Cisco IOS Release 10.0.

**Usage Guidelines** You can prevent access to your session while keeping your connection open by setting up a temporary password. To lock access to the terminal, follow this procedure:

- 
- Step 1** Issue the **lock** command.
- When you issue this command, the system prompts you for a password.
- Step 2** Enter a password, which can be any arbitrary string.
- The screen clears and displays the message “Locked.”
- Step 3** To regain access to your sessions, reenter the password.
- The Cisco IOS software honors session timeouts on a locked lines. You must clear the line to remove this feature. The system administrator must set the line up to allow use of the temporary locking feature by using the **lockable** line configuration command.
- 

**Examples** The following command locks access to the terminal line to which the user is connected. Only this user can access the session:

```
router(config-line)# lockable
router(config-line)# Ctrl-z
router# copy system:running-config nvram:startup-config
Building configuration...

OK
router# lock
Password:
Again:

Locked

Password:
router#
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>lockable</b>	Enables the lock EXEC command.
<b>login (EXEC)</b>	Enables or changes a login username.

# login (EXEC)

To change a login username, use the **login** command in EXEC mode.

**login**

**Syntax Description** This command has no arguments or keywords.

**Command Modes** EXEC

Command History	Release	Modification
	10.0	This command was introduced.

**Usage Guidelines** You can change a login username if you must match outgoing access list requirements or other login prompt requirements.

When you enter this command, the Cisco IOS software prompts you for a username and password. Enter the new username and the original password. If the username does not match, but the password does, the Cisco IOS software updates the session to the new username with which the **login** command attempt was made.

If no username and password prompts appear when you enter this command, the network administrator did not specify that a username and password be required at login time. If both the username and password are entered correctly, the session becomes associated with the specified username.

When you access a system using TACACS security with this command, enter your login name and specify a TACACS server using the following syntax when the “Username:” prompt appears:

```
user@tacacs-server
```

The TACACS server must be one of those defined in a Cisco IOS software configuration file. For more information, refer to the sections about specifying a TACACS host in the *Cisco IOS Security Configuration Guide*, or refer to the **tacacs-server host** command in the *Cisco IOS Security Command Reference Publication*.

If you do not specify a host, the Cisco IOS software tries each of the TACACS servers in the list until it receives a response.

If you do specify a host that does not respond, no other TACACS server is queried. The Cisco IOS software will deny access or function according to the action specified by the **tacacs-server last-resort** command, if one is configured.

If you specified a TACACS server host with the **user @tacacs-server** command, the TACACS server specified will be used for all subsequent authentication or notification queries, with the possible exception of SLIP address queries.

**Examples**

The following example shows how login usernames and passwords can be changed. In this example, a user currently logged on under the username user1 attempts to change that login name to user2. After entering the **login** command, the user enters the new username, but enters an incorrect password. Because the password does not match the original password, the system rejects the attempt to change the username.

```
router> login
Username: user2
Password:
% Access denied
Still logged in as "user1"
```

Next, the user attempts the login change again, with the user name user2, but enters the correct (original) password. This time the password matches the current login information, the login username is changed to user2, and the user is allowed access to the EXEC at the user-level.

```
router> login
Username: user2
Password:
router>
```

**Related Commands**

Command	Description
<b>line-power</b>	Sets up a temporary password on a line.
<b>lockable</b>	Enables the lock EXEC command.

# login (line)

To enable password checking at login, use the **login** command in line configuration mode. Use the **no** form of this command to disable password checking and allow connections without a password.

**login** [**local** | **tacacs**]

**no login**

## Syntax Description

<b>local</b>	(Optional) Selects local password checking. Authentication is based on the username specified with the <b>username</b> global configuration command.
<b>tacacs</b>	(Optional) Selects the TACACS-style user ID and password-checking mechanism.

## Defaults

Virtual terminals require a password. If you do not set a password for a virtual terminal, it responds to attempted connections by displaying an error message and closing the connection.

## Command Modes

Line configuration

## Command History

Release	Modification
10.0	This command was introduced.

## Usage Guidelines

If you specify the **login** command without the **local** or **tacacs** option, authentication is based on the password specified with the **password** line configuration command.



### Note

This command cannot be used with AAA/TACACS+. Use the **login authentication** command instead.

## Examples

The following example sets the password letmein on virtual terminal line 4:

```
line vty 4
 password letmein
 login
```

The following example enables the TACACS-style user ID and password-checking mechanism:

```
line 0
 password mypassword
 login tacacs
```

Related Commands	Command	Description
	<b>enable password</b>	Sets a local password to control access to various privilege levels.
	<b>peer default ip address</b>	Specifies an IP address, an address from a specific IP address pool, or an address from the DHCP mechanism to be returned to a remote peer connecting to this interface.
	<b>virtual-profile aaa</b>	Enables virtual profiles by AAA configuration.

# login-string

To define a string of characters that the Cisco IOS software sends to a host after a successful Telnet connection, use the **login-string** command in global configuration mode. Use the **no** form of this command to remove the login string.

**login-string** *hostname d message [%secp] [%secw] [%b] [%m] d*

**no login-string** *hostname*

## Syntax Description

<i>hostname</i>	Specifies the name of the host.
<i>d</i>	Sets a delimiting character of your choice—a pound sign (#) for example. You cannot use the delimiting character in the busy message.
<i>message</i>	Specifies the login string.
<i>%secp</i>	(Optional) Sets a pause in seconds. To insert pauses into the login string, embed a percent sign (%) followed by the number of seconds to pause and the letter “p.”
<i>%secw</i>	(Optional) Prevents users from issuing commands or keystrokes during a pause.
<i>%b</i>	(Optional) Sends a Break character.
<i>%m</i>	(Optional) Supports TN3270 terminals. Sends only CR and no LINE FEED.

## Defaults

No login strings are defined.

## Command Modes

Global configuration

## Command History

Release	Modification
10.0	This command was introduced.

## Usage Guidelines

Follow this command with one or more blank spaces and a delimiting character of your choice. Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character. To use a percent sign in the login string, precede it with another percent sign; that is, type the characters “%%.” The options can be used anywhere within the message string.

This command applies only to rlogin and Telnet sessions.

## Examples

In the following example, the value *%5p* causes a 5-second pause:

```
login-string office #ATDT 555-1234
%5p hello
#
```

# loopback (controller e1)

To loop an entire E1 line (including all channel groups defined on the controller) toward the line and back toward the router or access server, use the **loopback** command in controller configuration mode. Use the **no** form of this command to remove the loop.

**loopback**

**no loopback**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** Disabled

---

**Command Modes** Controller configuration

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Command History	Release	Modification
	11.1	This command was introduced.

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**Usage Guidelines** This command is useful for testing the DCE Channel Service Unit/Data Service Unit (CSU/DSU) itself. To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

---

**Examples** The following example configures the loopback test on the E1 line:

```
controller e1 0
 loopback
```

# loopback local (controller)

To loop an entire T1 line (including all channel groups defined on the controller) toward the line and the router or access server, use the **loopback local** command in controller configuration mode. Use the **no** form of this command to remove the loop.

**loopback local**

**no loopback local**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** Disabled

---

**Command Modes** Controller configuration

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.1	This command was introduced.

---

---

**Usage Guidelines** This command is useful for testing the DCE Channel Service Unit/Data Service Unit (CSU/DSU) itself. To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

---

**Examples** The following example configures the loopback test on the T1 line:

```
controller t1 0
 loopback local
```

# loopback local (interface)

To loop a channelized T1 or channelized E1 channel group, use the **loopback local** command in interface configuration mode. Use the **no** form of this command to remove the loop.

**loopback local**

**no loopback local**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** Disabled

---

**Command Modes** Interface configuration

---

Command History	Release	Modification
	11.1	This command was introduced.

---



---

**Usage Guidelines** This command is useful for looping a single channel group in a channelized environment without disrupting the other channel groups.

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

---

**Examples** The following example configures the loopback test on the T1 line:

```
interface serial 1/0:22
 loopback local
```

---

Related Commands	Command	Description
	<b>show interfaces loopback</b>	Displays information about the loopback interface.

---

# loopback remote (controller)

To loop packets from a MIP through the CSU/DSU, over a dedicated T1 link, to the remote CSU at the single destination for this T1 link and back, use the **loopback remote** command in controller configuration mode. Use the **no** form of this command to remove the loop.

**loopback remote**

**no loopback remote**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Disabled

**Command Modes** Controller configuration

Command History	Release	Modification
	11.1	This command was introduced.

**Usage Guidelines** This command applies only when the device supports the remote function. It is used for testing the data communication channels.

For MIP cards, this controller configuration command applies if *only one* destination exists at the remote end of the cloud, the entire T1 line is dedicated to it, and the device at the remote end is a CSU (not a CSU/DSU). This is an uncommon case; MIPs are not usually used in this way.

To show interfaces currently in loopback operation, use the **show interfaces loopback EXEC** command.

**Examples** The following example configures a remote loopback test:

```
interface serial 0
 loopback remote
```

Related Commands	Command	Description
	<b>show interfaces loopback</b>	Displays information about the loopback interface.

# 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** *classname*

## Syntax Description

*classname* Unique class identifier.

## Defaults

Disabled; no class name is provided.

## Command Modes

Global configuration

## Command History

Release	Modification
11.0	This command was introduced.

## Usage Guidelines

The *classname* argument in the **map-class dialer** command used to specify the class must be the same as a *classname* 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 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 17.

**Table 17 NSF Keywords and Supported Services**

Keyword	NSF Dialing Plan	Data	Voice	International
<b>sdnplan</b>	SDN	Yes	Yes	GSDN (Global SDN)
<b>megaplan</b>	MEGACOMM	No	Yes	Yes
<b>accuplan</b>	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 7.1.1.7 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
 dialer map ip 7.1.1.8 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 415-390-9503
 ip address 6.1.1.3 255.255.255.0
 encapsulation ppp
 no keepalive
 dialer map ip 6.1.1.1 name tommyjohn class sdnplan 14085770715
 dialer map ip 6.1.1.2 name angus class megaplan 14085773775
 dialer map ip 6.1.1.4 name angus class accuplan 14085773778
 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 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 7.1.1.7 255.255.255.0
 encapsulation ppp
 dialer callback-secure
 dialer enable-timeout 2
 dialer map ip 7.1.1.8 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 a map class called “hawaii” and sets an ISDN speed of 56 kbps for the class.

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

#### Related Commands

Command	Description
<b>dialer map</b>	Configures a serial interface or ISDN interface to call one or multiple sites or to receive calls from multiple sites.
<b>dialer string (legacy DDR)</b>	Specifies the destination string (telephone number) to be called for interfaces calling a single site.
<b>show controllers e1</b>	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. Use the **no** form of the command to restore defaults set at the group master interface.

**member** *number interface-command*

**no member** *number interface-command*

<b>Syntax Description</b>	<i>number</i>	Number of the asynchronous interface to be altered.
	<i>interface-command</i>	One or more of the following commands entered for this specific interface: <ul style="list-style-type: none"> <li><b>peer default ip address</b></li> <li><b>description</b></li> </ul>

**Defaults** No individual configurations are set for member interfaces.

**Command Modes** Interface configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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.) Use the **no** form of this command to restore the defaults set at the group master interface.

**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
```

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

# 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. Use the **no** form of this command to revert to the default value.

**modem answer-timeout** *seconds*

**no modem answer-timeout**

<b>Syntax Description</b>	<i>seconds</i>	Specifies the timeout interval in seconds.
---------------------------	----------------	--

<b>Defaults</b>	15 seconds
-----------------	------------

<b>Command Modes</b>	Line configuration
----------------------	--------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	10.0	This command was introduced.

<b>Usage Guidelines</b>	<p>This command is useful for modems that take a long time to synchronize to the appropriate line speed. For more information, see the chapter “Configuring Modems and Chat Scripts” in the <i>Cisco IOS Dial Services Configuration Guide: Terminal Services</i>.</p>
-------------------------	--

<b>Examples</b>	<p>The following example sets the timeout interval to 20 seconds for the modem connected to lines 3 through 13:</p>
-----------------	---

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

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>modem callin</b>	Supports dial-in modems that use the DTR signal to control the off-hook status of the modem.
	<b>modem inout</b>	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 commands to Microcom manageable modems, use the **modem at-mode** command in EXEC mode.

**modem at-mode** *slot/port*

<b>Syntax Description</b>	<i>slot/port</i>	Slot and modem port number. Remember to include the forward slash (/) when entering this variable.
---------------------------	------------------	--

<b>Defaults</b>	Disabled
-----------------	----------

<b>Command Modes</b>	EXEC
----------------------	------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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, which do not 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 command **ATH** 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:      FFFFFFFFFF
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   ATSO=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
<b>clear modem</b>	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. The **no** form of this command disables permission for modems to accept a direct connection.

**modem at-mode-permit**

**no modem at-mode-permit**

**Syntax Description** This command has no arguments or keywords.

**Defaults** 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 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
	<b>clear modem</b>	Resets the hardware for one or more manageable modems on access servers and routers.
	<b>modem at-mode</b>	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 what kind of modem is connected to the router and to configure that modem automatically, use the **modem autoconfigure discovery** command in line configuration mode. Use the **no** form of this command to disable this feature.

**modem autoconfigure discovery**

**no modem autoconfigure discovery**

**Syntax Description** This command has no arguments or keywords.

**Defaults** This command has no default.

**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. 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 discovers whatever kind of modem is attached to the router or access server:

```
modem autoconfigure discovery
```

## Related Commands

Command	Description
<b>modem autoconfigure type</b>	Directs a line to attempt to configure the attached modem using the entry for modem-name.

# modem autoconfigure type

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

**modem autoconfigure type** *modem-name*

**no modem autoconfigure type**

<b>Syntax Description</b>	<i>modem-name</i> The name of the modem (such as Codex_3260).				
<b>Defaults</b>	No default behavior or values.				
<b>Command Modes</b>	Line configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>11.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	11.1	This command was introduced.
Release	Modification				
11.1	This command was introduced.				
<b>Usage Guidelines</b>	The modem is reconfigured each time the line goes down.				
<b>Examples</b>	<p>The following example automatically configures the attached modem using the codex_3260 modemcap entry:</p> <pre>modem autoconfigure type Codex_3260</pre>				
<b>Related Commands</b>	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><b>modem autoconfigure discovery</b></td> <td>Configures a line to discover which kind of modem is connected to the router and to configure that modem automatically.</td> </tr> </tbody> </table>	Command	Description	<b>modem autoconfigure discovery</b>	Configures a line to discover which kind of modem is connected to the router and to configure that modem automatically.
Command	Description				
<b>modem autoconfigure discovery</b>	Configures a line to discover which kind of modem is connected to the router and to configure that modem automatically.				

# modem autotest

To automatically and periodically perform a modem diagnostics test for modems inside the access server or router, use the **modem autotest** command in global configuration mode. Use the **no** form of this command to disable or turn off the modem autotest service.

**modem autotest** {**error** *threshold* | **minimum** *modem* | **time** *hh:mm* [*interval*]}

**no modem autotest**

## Syntax Description

<b>error</b> <i>threshold</i>	Maximum modem error threshold. When the system detects this many errors with the modems, the modem diagnostics test is automatically triggered. Specify a threshold count between 3 and 50.
<b>minimum</b> <i>modem</i>	Minimum number of modems that will remain untested and available to accept calls during each test cycle. You can specify between 5 and 48 modems. The default is 6 modems.
<b>time</b> <i>hh:mm</i>	Time you want the modem autotest to begin. You must use the military time convention and a required colon (:) between the hours and minutes variables for this feature. For example, 1:30 a.m. is issued as 01:30.
<i>interval</i>	(Optional) Long-range time variable used to set the modem autotest more than one day in advance. The range of hours is between 1 hour and 168 hours. For example if you want to run the test once per week, issue 168. There are 168 hours in one week.

## Defaults

Disabled

## Command Modes

Global configuration

## Command History

Release	Modification
11.3	This command was introduced.

## Examples

The following example shows how to set the modem autotest to run once per week at 3:00 a.m. Additionally, the autotest will activate if the system detects a modem error count higher than 40 errors.

### Step 1

Determine the current time set on the access server with the **show clock EXEC** command. In this example, the time and date set is 3:00 p.m, Monday, August 25, 1997:

```
router# show clock
*15:00:01.031 EST Aug 25 1997
```

- Step 2** Enter global configuration mode and set the time you want the modem autotest to activate. In this example, the access server is configured to run the modem autotest each ongoing Tuesday at 3:00 a.m.:

```
router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
router(config)# modem autotest time 03:00 168
```

- Step 3** Configure the autotest to activate if the system detects a high modem error count. In this example, the autotest activates if the system detects a modem error count higher than 40 errors. For the list of modem errors that are monitored by the **modem autotest** command, see the **show modem call-stats** command.

```
router(config)# modem autotest error 40
router(config)# exit
router#
%SYS-5-CONFIG_I: Configured from console by console
router#
```

- Step 4** Display the results of the modem autotest once the test has run through a test cycle by issuing the **show modem test EXEC** command:

```
router# show modem test
Date Time           Modem  Test                Reason              State Result
5/15 07:25:17 AM  1/0   Back-To-Back        TIME INTERVAL       Idle  FAIL
5/15 07:25:17 AM  1/1   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/2   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/3   Back-To-Back        TIME INTERVAL       Idle  FAIL
5/15 07:25:17 AM  1/4   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/5   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/6   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/7   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/8   Back-To-Back        TIME INTERVAL       Idle  PASS
5/15 07:25:17 AM  1/9   Back-To-Back        TIME INTERVAL       Idle  PASS
...
```

Alternatively, you can view which modems were marked bad by the modem autotest by issuing the **show modem EXEC** command. Bad modems are marked by the letter B. In this example, modems 1/0 and 1/3 are marked bad (identified with a B), which takes them out of commission and unable to participate in dial services:

```
router# show modem
          Inc calls   Out calls   Busied   Failed   No   Succ
Mdm  Usage   Succ  Fail  Succ  Fail  Out  Dial  Answer  Pct.
B 1/0  0%      0     0     0     0     1     0     0     0%
  1/1  0%      0     0     0     0     3     0     0     0%
  1/2  0%      0     0     0     0     1     0     0     0%
B 1/3  0%      0     0     0     0     1     0     0     0%
  1/4  0%      0     0     0     0     1     0     0     0%
  1/5  0%      0     0     0     0     1     0     0     0%
  1/6  0%      0     0     0     0     1     0     0     0%
  1/7  0%      0     0     0     0     1     0     0     0%
  1/8  0%      0     0     0     0     1     0     0     0%
  1/9  0%      0     0     0     0     1     0     0     0%
...
  1/20 0%      0     0     0     0     0     0     0     0%
  1/21 0%      0     0     0     0     0     0     0     0%
  1/22 0%      0     0     0     0     0     0     0     0%
```

# 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. Use the **no** form of this command to restore a modem to service.

**modem bad**

**no modem bad**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** 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 issued 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 dial-up 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
<b>modem startup-test</b>	Performs diagnostic testing on each integrated modem during the rebooting process.
<b>show modem</b>	Displays a high-level performance report for all the modems or a single modem.
<b>terminate-from</b>	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** *number*

<b>Syntax Description</b>	<i>number</i>	Defined number of modem events that each manageable modem is able to store.
---------------------------	---------------	---

<b>Defaults</b>	100 modem events
-----------------	------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.

<b>Usage Guidelines</b>	A large buffer size uses significant amounts of processing memory. If the processing memory is running low, reduce the modem buffer size.
-------------------------	---

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



**Note**

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

<b>Examples</b>	The following example enables each modem in the access server to store 150 modem events:
-----------------	--

```
modem buffer-size 150
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>show modem log</b>	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. Use the **no** form of this command to reenable a modem.

**modem busyout**

**no modem busyout**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** Disabled

---

**Command Modes** Line configuration

---

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 a **busyout-threshold** 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/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
	<b>busyout</b>	Informs the central-office switch that a channel is out-of-service.
	<b>ds0 busyout</b>	Places one or more DS0s (digital signal level 0s) out of service.
	<b>modem shutdown</b>	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. Use the **no** form of this command to remove the threshold.

**modem busyout-threshold** *threshold-number*

**no modem busyout-threshold** *threshold-number*

<b>Syntax Description</b>	<i>threshold-number</i>	The 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.
---------------------------	-------------------------	--

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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 see if the number of free modems is less than the user specified threshold and if it is it ensures the number of free DS0 channels is less than or equal to the number of modems.

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

Since 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 since 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 it is not, this will cause a lot of messaging traffic to the exchange and may cause active calls to be dropped. This 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.

---

**Examples**

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

```
configure terminal
# modem busyout-threshold 30
# exit
```

---

**Related Commands**

Command	Description
<b>busyout</b>	Informs the central-office switch that a channel is out-of-service.
<b>ds0 busyout</b>	Places one or more DS0s (digital signal level 0s) out of service.
<b>modem busyout</b>	Disables a modem from dialing or answering calls whereby the disabling action is not executed until the active modem returns to an idle state.
<b>modem shutdown</b>	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** [**max userid** *number*]

**no modem call-record**

## Syntax Description

<b>terse</b>	Specifies that only significant data is logged to the Modem Call Record (MCR).
<b>max userid</b> <i>number</i>	(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 <b>max-userid</b> keyword was added.
12.0(4)T	The <b>max-userid</b> keyword was added.

## Usage Guidelines

The modem management subsystem provides event logs for each modem at each major event during usage of the modems. The volume of event logs being generated make the monitoring of modem calls for debugging purposes difficult. 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.

The information provided in the MCR log and the Modem Call Failed Record log varies depending on the type of modem being used. Table 18 describes the significant fields in the display for MICA and Microcom modems.

**Table 18** *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.

**Table 18** *modem call-record Field Descriptions (continued)*

Field	Description
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 <sup>1</sup>	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 <sup>1</sup>	Amount of digital padding (attenuation) in downlink, in decibels. (Only reported for V.90 and K56Flex.)
Total retrains <sup>1</sup>	Count of total retrains and speed shifts.
Signal quality value <sup>1</sup>	This value ranges from 0 to 7, where 0 is the worst. The units are arbitrary, approximating $\text{abs}(\log_{10}(\text{SNR}))$ .
SNR	Signal-to-noise ratio, ranging from 0 to 70 in dB steps.
Characters received	Count of total characters received for SYNC/ASYNC connection.
Characters transmitted	Count of total characters sent for SYNC/ASYNC connection.
Characters received BAD <sup>1</sup>	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.

**Table 18** modem call-record Field Descriptions (continued)

Field	Description
Error correction frames transmitted	Count of unique Error Correction frames sent. Re-sent frames are not included.
Error correction frames received BAD/ABORTED <sup>1</sup>	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=jdoe 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=0x3
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**

<b>Command</b>	<b>Description</b>
<b>show logging</b>	Displays the state of logging (syslog).
<b>terminal monitor</b>	Displays <b>debug</b> 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. Use the **no** form of this command to disable this feature.

**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 RING, 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 DTR, which disconnects the modem. This command is useful for older modems that do not support auto answer.

This command uses CTS, whereas newer modem commands in the Cisco IOS software use DSR.

Only use the **modem callin** command on the ASM terminal server, where hardware flow control is not possible. If you have a more recent device (such as a Cisco 2509 through 2512, Cisco 2520 through 2523, a Cisco AS5100, Cisco 3600 series, or Cisco AS5200), 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
	<b>modem answer-timeout</b>	Sets the amount of time that the Cisco IOS software waits for the CTS signal after raising the DTR signal in response to RING.
	<b>modem inout</b>	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. Use the **no** form of this command to disable this feature.

**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 CTS 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 2509 through 2512, Cisco 2520 through 2523, a Cisco AS5100, Cisco 3600 series, or a Cisco AS5200), use the **modem host** command instead. The **modem callout** command uses CTS, whereas the **modem host** command uses 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
	<b>modem inout</b>	Configures a line for both incoming and outgoing calls.
	<b>show async-bootp</b>	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. Use the **no** form of this command to remove a country code from service.

**modem country mica** *country*

**no modem country mica** *country*

<b>Syntax Description</b>	<i>country</i>	Specifies a type of country code. Replace the argument <i>country</i> with one of the supported country names in Table 19.
<b>Defaults</b>	Disabled	
<b>Command Modes</b>	Global configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2 P	This command was introduced.
<b>Usage Guidelines</b>	Table 20 lists the supported codes for the <i>country</i> argument.	

**Table 19 MICA Country Codes**

<b>australia</b>
<b>austria</b>
<b>belgium</b>
<b>china</b>
<b>cyprus</b>
<b>czech-republic</b> (Czech/Slovak Republic)
<b>denmark</b>
<b>e1-default</b> (Default E1, A Law)
<b>finland</b>
<b>france</b>
<b>germany</b>
<b>hong-kong</b>
<b>india</b>
<b>ireland</b>
<b>israel</b>

**Table 19 MICA Country Codes (continued)**

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

**Examples**

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

```
router(config)# modem country mica ?
  australia      Australia
  austria        Austria
  belgium        Belgium
  china          China
  cyprus         Cyprus
  czech-republic Czech/Slovak Republic
  denmark        Denmark
  e1-default     Defaults E1 (A Law)
  finland        Finland
  france         France
  germany        Germany
  hong-kong      Hong Kong
  india          India
  ireland        Ireland
  israel         Israel
  italy          Italy
  japan          Japan
  malaysia       Malaysia
  netherlands    Netherlands
  new-zealand    New Zealand
  norway         Norway
  poland         Poland
```

portugal	Portugal
russia	Russia
singapore	Singapore
south-africa	South Africa
spain	Spain
sweden	Sweden
switzerland	Switzerland
t1-default	Defaults T1 (u Law)
taiwan	Taiwan
thailand	Thailand
turkey	Turkey
united-kingdom	United Kingdom
usa	USA

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>modem country</b> <b>microcom_hdms</b>	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 modems, use the **modem country microcom\_hdms** command in global configuration mode. Use the **no** form of this command to remove a country code from service.

**modem country microcom\_hdms** *country*

**no modem country microcom\_hdms** *country*

## Syntax Description

*country* Specifies a type of country code. Replace the argument *country* with one of the supported country names in Table 20.

## Defaults

No country code enabled.

## Command Modes

Global configuration

## Usage Guidelines

Table 20 lists the supported codes for the *country* argument.

**Table 20** *Microcom Country Codes*

<b>argentina</b>
<b>australia</b>
<b>austria</b>
<b>belgium</b>
<b>brazil</b>
<b>canada</b>
<b>chile</b>
<b>china</b>
<b>columbia</b>
<b>czech-republic</b> (Czech/Slovak Republic)
<b>denmark</b>
<b>europa</b>
<b>finland</b>
<b>france</b>
<b>germany</b>
<b>greece</b>
<b>hong-kong</b>
<b>hungary</b>
<b>india</b>

**Table 20** *Microcom Country Codes (continued)*

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

**Command History**

Release	Modification
11.2P	This command was introduced.
12.0	The <b>europe</b> keyword was added.

**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
<b>modem country mica</b>	Configures the modem country code for a bank of MICA modems.

## modem cts-required

The **modem printer** command replaces the **modem cts-required** 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. Use the **no** form of this command to disable this feature.

**modem dialin**

**no modem dialin**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** Do not permit incoming calls to the modem.

---

**Command Modes** Line configuration

---

Command History	Release	Modification
	11.1	This command was introduced.

---



---

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

---

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

```
line 5
modem dialin
```

---

Related Commands	Command	Description
	<b>modem inout</b>	Configures a line for both incoming and outgoing calls.
	<b>parity</b>	Defines generation of a parity bit.

---

# 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. Use the **no** form of this command to disable this feature.

**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
	<b>modem cts-required</b>	The modem printer command replaces this command.

---

# modem hold-reset

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

**modem hold-reset**

**no modem hold-reset**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Disabled

**Command Modes** Line configuration

Command History	Release	Modification
	11.2	This command was introduced.

**Usage Guidelines** 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.

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.

**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
exit
```

Related Commands	Command	Description
	<b>modem autotest</b>	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. Use the **no** form of this command to disable the line modem control for reverse connections.

**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 DSR/DCD is used for modem control instead of CTS. This frees CTS for use by hardware flow control.

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

```
line 5
modem host
```

Related Commands	Command	Description
	<b>modem callout</b>	Configures a line for reverse connections.
	<b>modem printer</b>	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. Use the **no** form of this command to disable the line.

**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
	<b>parity</b>	Defines generation of a parity bit.

# modem log

To configure the types of EIA/TIA events which 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 | rs323 | rts | tst}
```

```
no modem log {cts | dcd | dsr | dtr | ri | rs323 | rts | tst}
```

## Syntax Description

<b>cts</b>	Specifies that EIA/TIA clear to send (CTS) events are stored in the modem log.
<b>dcd</b>	Specifies that EIA/TIA data carrier detect (DCD) events are stored in the modem log.
<b>dsr</b>	Specifies that EIA/TIA data set ready (DSR) events are stored in the modem log.
<b>dtr</b>	Specifies that EIA/TIA data terminal ready (DTR) events are stored in the modem log.
<b>ri</b>	Specifies that EIA/TIA RI events are stored in the modem log.
<b>rs323</b>	Specifies that all EIA/TIA events are stored in the modem log.
<b>rts</b>	Specifies that EIA/TIA request to send (RTS) events are stored in the modem log.
<b>tst</b>	Specifies that EIA/TIA 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	This command was integrated into Cisco IOS Release 12.0.
12.0(5)T	This command was introduced for 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:

```
router(config)# line 1 120
router(config-line)# modem log cts
router(config-line)# modem log dsr
```

## Related Commands

Command	Description
<b>show modem log</b>	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. Use the **no** form of this command to remove modem parameters.

**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

<b>min-speed</b>	Configures the minimum modem speed for all the modems used by this service profile.
<i>speed</i>	Specifies the minimum and maximum bps rate for the modems, which can be between 300 and 56,000 bps. Must be in V.90 increments.
<b>any</b>	Specifies any minimum or maximum speed.
<b>max-speed</b>	Configures the maximum modem speed for all the modems used by this service profile. Must be in V.90 increments.
<b>modulation</b> <i>value</i>	(Optional) Specifies the maximum negotiated speed. Replace the value argument with one of the following choices: <b>any</b> , <b>k56flex</b> , <b>v22bis</b> , <b>v34</b> , or <b>v90</b> .

## 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.

## Usage Guidelines

Use the **modem min-speed max-speed** service profile configuration command to configure various modem-service parameters:

## 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.

**modem poll retry** *number*

<b>Syntax Description</b>	<i>number</i>	Maximum number of polling attempts. The configuration range is from 0 to 10 attempts.
---------------------------	---------------	---

<b>Defaults</b>	Three polling attempts
-----------------	------------------------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.

<b>Usage Guidelines</b>	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, which do not have out-of-band ports.

<b>Examples</b>	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
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>clear modem</b>	Resets the hardware for one or more manageable modems on access servers and routers.
	<b>modem poll time</b>	Sets the time interval between modem polls, which are used to periodically retrieve and report modem statistics.
	<b>modem status-poll</b>	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. Use the **no** form of this command to restore the 12-second default setting.

**modem poll time** *seconds*

**no modem poll time** *seconds*

Syntax Description	<i>seconds</i>	Number of seconds between polls. The configuration range is from 2 to 120 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
	<b>modem min-speed</b> <b>max-speed</b>	Sets the maximum number of polling attempts used to retrieve performance statistics from a modem installed in an access server or router.
	<b>modem status-poll</b>	Polls for modem statistics through the out-of-band feature of a modem.

# modem printer

To configure a line to require a Data Set Ready (DSR) signal, use the **modem printer** command in line configuration mode. Use the **no** form of this command to use Clear to Send (CTS) instead of DSR.

**modem printer**

**no modem printer**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** No modem control

---

**Command Modes** Line configuration

---

Release	Modification
11.1	This command was introduced.

---

---

**Usage Guidelines** This command uses Ring/Data Carrier Detect/Data Set Ready as the modem control signals instead of CTS. This leaves CTS free for use in hardware flow control. You can configure hardware flow control concurrently with the **modem printer** command.

While 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/CD, as the Carrier Detect (CD) signal.

---

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

```
line 5
modem printer
```

# modem recovery action

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

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

**no modem recovery action**

## Syntax Description

<b>disable</b>	Mark the modem bad.
<b>download</b>	Recover by firmware download. Sets the modem into a recovery pending state, thus, stopping the modem from accepting new calls.
<b>none</b>	Do not try to recover. Ignore the recovery threshold and just keep going.

## Defaults

The default setting is **modem recovery action download**.

## 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 modems (or 12) in a module to be re-loaded.

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**.



### 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.

## Examples

The following example shows the available options for this command:

```
modem recovery action ?
  disable  Mark the modem bad
  download Recover by firmware download
  none     Do not try to recover
```

Related Commands	Command	Description
	<b>modem recovery maintenance</b>	Specifies the scheduled modem maintenance recovery behavior.
	<b>modem recovery threshold</b>	Specifies the threshold, which starts the modem recovery process.
	<b>modem recovery-time</b>	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. Use the **no** form of this command to turn off this behavior.

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

**no modem recovery maintenance**

Syntax Description		
<b>action</b>		Mode of recovery. The default is set to <b>reschedule</b> .
<b>disable</b>		Mark the modem bad. Mark the originally faulty modem as bad and return all other modems back into service.
<b>drop-call</b>		Force firmware download by dropping holding calls. This forces the recovery by dropping any active calls remaining on modems within the module.
<b>reschedule</b>		Reschedule firmware download to next maintenance time. Leave the originally faulty modem as needing recovery and return all other modems back into service. Recovery will be attempted again on the following day. The default is set to reschedule.
<b>max-download</b> <i>number</i>		Maximum simultaneous recovery downloads. You must choose one number from 1 to 30. A range of values is not supported.
<b>schedule</b>		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.
<b>immediate</b>		Immediately attempt module recovery.
<b>pending</b>		Delay recovery until maintenance time.
<b>time</b> <i>hh:mm</i>		Time of day for scheduled modem recovery. 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 AM.
<b>window</b> <i>minutes</i>		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 AM.

### 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 modems (or 12) in a module to be re-loaded.

Every 24 hours, the modem recovery maintenance process will wake up and attempt to recover any modems which 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**. These options are 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 can potentially be 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% 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 number** command.

**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.

**Examples**

The following example shows the available options for this command:

```
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

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

modem recovery maintenance max-download ?
  <1-30>        Number of MICA modules which can be simultaneously recovered

modem recovery maintenance schedule ?
  immediate     Attempt recovery immediately
  pending       Delay recovery until maintenance time
```

Related Commands	Command	Description
	<b>modem recovery action</b>	Specifies the modem recovery mode when a modem has been identified as faulty.
	<b>modem recovery threshold</b>	Specifies the threshold, which starts the modem recovery process.
	<b>modem recovery-time</b>	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 the threshold, which starts the modem recovery process, use the **modem recovery threshold** command in global configuration mode. Use the **no** form of this command to disable the threshold value.

**modem recovery threshold** *number*

**no modem recovery threshold**

<b>Syntax Description</b>	<i>number</i>	Number of consecutive call attempts, which fail to train up, before the modem is deemed faulty. Choose from 1 to 1000.
---------------------------	---------------	--

**Defaults** 30 call attempts are enabled by default.

**Command Modes** Global configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	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 modems (or 12) 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 the variable number for this command:

```
modem recovery threshold ?
<1-10000> Number of failures after which modem recovery is started
```

Related Commands	Command	Description
	<b>modem recovery action</b>	Specifies the modem recovery mode when a modem has been identified as faulty.
	<b>modem recovery maintenance</b>	Specifies the scheduled modem maintenance recovery behavior.
	<b>modem recovery-time</b>	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. The **no** form of this command sets a 5-minute response time, which is the default setting.

**modem recovery-time** *minutes*

**no modem recovery-time**

<b>Syntax Description</b>	<i>minutes</i>	Maximum amount of time local modems wait for a response.
---------------------------	----------------	--

<b>Defaults</b>	5 minutes
-----------------	-----------

<b>Command Modes</b>	Global configuration
----------------------	----------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.
12.1(2.3)T1	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)T1, 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
```

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

## modem ri-is-cd

The **modem dialin** command replaces the **modem ri-is-cd** 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. Use the **no** form of this command to take the modem out of a shutdown state and place it back in service.

**modem shutdown**

**no modem shutdown**

**Syntax Description** This command has no arguments or keywords.

**Defaults** 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
	<b>modem busyout</b>	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

To perform diagnostic testing on each integrated modem during the rebooting process, use the **modem startup-test** command in global configuration mode. Use the **no** form of this command to disable startup testing.

**modem startup-test**

**no modem startup-test**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Enabled

**Command Modes** Global configuration

## Command History

Release	Modification
11.2	This command was introduced.

## Usage Guidelines

The results of the modem startup test output are displayed in the *Status* column of the **show modem** command. Modems that pass the diagnostic test are marked as *Idle*, *Busy*, *Downloading*, and *Reset*. Modems that fail the diagnostic test are marked as *Bad\**. These modems cannot be used for call connections. Depending on how many modems are installed, this diagnostic test may take from 5 to 15 minutes to complete.

Perform additional testing on an inoperative modem by executing the **test modem back-to-back** command. The **no modem startup-test** command disables startup testing.

## Examples

The following example performs a startup test on the integrated Cisco AS5200 modems:

```
configure terminal
modem startup-test
```

Display the results of the modem startup test after you restart the system by enabling the **show modem** command.

## Related Commands

Command	Description
<b>modem autotest</b>	Automatically and periodically performs a modem diagnostics test for modems inside the access server or router.
<b>show modem at-mode</b>	Displays a list of the manageable Microcom modems that have open AT sessions and a list of users logged in to those sessions.
<b>terminate-from</b>	Diagnoses an integrated modem that may not be functioning properly.

# 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. Use the **no** form of this command to disable status polling through the out-of-band feature for a specified modem.

**modem status-poll**

**no modem status-poll**

**Syntax Description** This command has no arguments or keywords.

**Defaults** 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, which do not 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
	<b>modem min-speed</b> <b>max-speed</b>	Sets the maximum number of polling attempts used to retrieve performance statistics from a modem installed in an access server or router.
	<b>modem poll time</b>	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 value*

Syntax Description		
	<i>modem-name</i>	Name of the modem whose values are being edited.
	<i>attribute</i>	Modem capability, or attribute, as defined by the <b>show modemcap</b> command.
	<i>value</i>	The AT command equivalent (such as <b>&amp;F</b> ).

**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
	<b>modemcap entry</b>	Stores and compresses information about the capability of a specified modem.
	<b>show modemcap</b>	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. Use the **no** form of this command to disable this feature.

**modemcap entry** *modem-type*

<b>Syntax Description</b>	<i>modem-type</i> Type of supported modem as specified in Table 21.				
<b>Defaults</b>	The capability values that exist in the specified modem at the time that the command is issued.				
<b>Command Modes</b>	Global configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>11.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	11.1	This command was introduced.
Release	Modification				
11.1	This command was introduced.				

**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 21 lists the modemcap entries for supported modems.

**Table 21 Modemcap Entries for Supported Modems**

Modem Type	Output
hayes_optima	FD=&F:AA=S0=1:DTR=&D2:CD=&C1:TPL=default.
codex_3260	FD=&F:AA=S0=1:CD=&C1:DTR=&D2:HFL=*FL3:SPD=*SC1:BER=*SM3:BCP=*DC1:NER=*SM1:NCP=*DC0:NEC=E0:NRS=Q1:CID=&S1.
usr_courier	HFL=&H1&R2:SPD=&B1:BER=&M4:BCP=&K1:NER=&M0:NCP=&K0:TPL=default.
usr_sportster	TPL=usr_courier.
hayes_optima	HFL=&K3:BER=&Q5:BCP=&Q9:NER=&Q0:NCP=&Q0:TPL=default.
viva	HFL=&K3:BER=&Q5:BCP=%C1:NER=&Q6:NCP=%C0:TPL=default.
telebit_t3000	HFL=S58=2:BER=S180=3:BCP=S190=1:NER=S180=0:NCP=S190=0:TPL=default.

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

# modem-pool

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

**modem-pool** *name*

**no modem-pool** *name*

## Syntax Description

<i>name</i>	Specifies the 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, then 120 modems are in the default modem pool.

## Command Modes

Global configuration

## Command History

Release	Modification
11.2P	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 is 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 DNIS number.

Virtual partitioning is 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. The access server's prompt changes from `as5300(config)#` to `as5300(config-modem-pool)#`.

```
modem-pool v90service
```

The next example assigns modem TTY line numbers 30 to 50 to a modem pool. The DNIS number is set to 2000. The customers dialing the number 2000 are guaranteed access to 21 modems. The 22nd client to dial in is refused connectivity because the maximum number of allowable connections is exceeded.

```
pool-range 30-50
called-number 2000 max-conn 21
exit
```

#### Related Commands

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