show modem

To display a high-level performance report for all the modems or a single modem inside Cisco access servers, use the **show modem** command in EXEC mode.

show modem [*slot/port* | **group** *number*]

Syntax Description

slot/port	(Optional) Location of a slot and modem port. Include the slash mark when entering this variable.
group *number*	(Optional) Modem group to which a specified modem belongs. The group number range is from1 to 200.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
1 2.1(5)T	This command was enhanced to display information about modems on the Cisco 3600 series that support V.110.

Examples

The following is sample output from the **show modem** command for two V.34 modem cards inserted in a Cisco AS5200:

```
Router# show modem

                Inc calls     Out calls     Busied   Failed  No       Succ
  Mdm  Usage    Succ   Fail   Succ   Fail   Out      Dial    Answer   Pct.
* 1/0    17%     74      3      0      0      0        0       0      96%
* 1/1    15%     80      4      0      0      0        1       1      95%
* 1/2    15%     82      0      0      0      0        0       0     100%
  1/3    21%     62      1      0      0      0        0       0      98%
  1/4    21%     49      5      0      0      0        0       0      90%
* 1/5    18%     65      3      0      0      0        0       0      95%
* 1/6    19%     58      2      0      0      0        0       0      96%
* 1/7    17%     67      5      0      0      0        1       1      93%
* 1/8    20%     68      3      0      0      0        0       0      95%
  1/9    16%     67      2      0      0      0        0       0      97%
  1/10   18%     56      2      0      0      0        1       1      96%
* 1/11   15%     76      3      0      0      0        0       0      96%
* 1/12   16%     62      1      0      0      0        0       0      98%
  1/13   17%     51      4      0      0      0        0       0      92%
  1/14   16%     51      5      0      0      0        0       0      91%
  1/15   17%     65      0      0      0      0        0       0     100%
  1/16   15%     73      3      0      0      0        0       0      96%
  1/17   17%     67      2      0      0      0        0       0      97%
  1/18   17%     61      2      0      0      0        0       0      96%
* 1/19   17%     74      2      0      0      0        0       0      97%
  1/20   16%     65      1      0      0      0        0       0      98%
* 1/21   16%     58      3      0      0      0        0       0      95%
* 1/22   18%     56      4      0      0      0        0       0      93%
* 1/23   20%     60      4      0      0      0        0       0      93%
```

The following is sample output from the **show modem** command for two V.110 modem cards inserted in a Cisco AS5200:

```
Router# show modem

                Inc calls      Out calls   Busied   Failed  No       Succ
  Mdm  Usage    Succ   Fail    Succ   Fail   Out      Dial    Answer   Pct.
  0/0     0%       -      -       -      -       0        0       0      -
  0/1     0%       -      -       -      -       0        0       0      -
  0/2     0%       -      -       -      -       0        0       0      -
  0/3     0%       -      -       -      -       0        0       0      -
  0/4     0%       -      -       -      -       0        0       0      -
  0/5     0%       -      -       -      -       0        0       0      -
  0/6     0%       -      -       -      -       0        0       0      -
  0/7     0%       -      -       -      -       0        0       0      -
  0/8     0%       -      -       -      -       0        0       0      -
  0/9     0%       -      -       -      -       0        0       0      -
  0/10    0%       -      -       -      -       0        0       0      -
  0/11    0%       -      -       -      -       0        0       0      -
  1/0     0%       -      -       -      -       0        0       0      -
  1/1     0%       -      -       -      -       0        0       0      -
  1/2     0%       -      -       -      -       0        0       0      -
  1/3     0%       -      -       -      -       0        0       0      -
  1/4     0%       -      -       -      -       0        0       0      -
  1/5     0%       -      -       -      -       0        0       0      -
  1/6     0%       -      -       -      -       0        0       0      -
  1/7     0%       -      -       -      -       0        0       0      -
  1/8     0%       -      -       -      -       0        0       0      -
  1/9     0%       -      -       -      -       0        0       0      -
  1/10    0%       -      -       -      -       0        0       0      -
  1/11    0%       -      -       -      -       0        0       0      -
```

The following is sample output from the **show modem** command for a Cisco 3600 series router:

```
Router# show modem

  Codes:
  * - Modem has an active call
  R - Modem is being Reset
  D - Download in progress
  B - Modem is marked bad and cannot be used for taking calls
  b - Modem is either busied out or shut-down

        Avg Hold     Inc calls     Out calls    Busied   Failed    No      Succ
  Mdm     Time      Succ   Fail   Succ   Fail     Out      Dial   Answer   Pct.
* 0/0   00:21:01     132      0      0      0       0         0       0    100%
* 0/1      2d01h       1      0      0      0       0         0       0    100%
  0/2   00:00:34     130      0      0      0       0         0       0    100%
* 0/3   00:21:53     126      1      0      0       0         0       0     99%
* 0/4      2d01h       1      0      0      0       0         0       0    100%
  0/5   00:00:33     131      0      0      0       0         0       0    100%
* 0/6   00:21:12     131      0      0      0       0         0       0    100%
  0/7   00:00:34     131      0      0      0       0         0       0    100%
b 0/8   00:00:00       0      0      0      0       0         0       0      0%
b 0/9   00:00:00       0      0      0      0       0         0       0      0%
!.
!.
!.
b 0/29  00:00:00       0      0      0      0       0         0       0      0%
Total:  00:18:25     783      1      0      0       0         0       0     99%
```

Table 67 describes the significant fields shown in the previous displays of the **show modem** command.

Table 67 show modem Field Descriptions

Field	Description
Mdm	Slot and modem port number. Also, the following modem states can appear to the left of a slot/modem port number: b—Modem was removed from service with the **modem shutdown** command or the **modem busyout** command. B—Modem is suspected to be inoperable or bad. No calls can be made with this modem. The letter B can also mean that a modem firmware download failed for the specified modem. In this case, try unmarking the modem as bad with the **no modem bad** command and upgrading the modem firmware again. d—The RAM-based Digital Signal Processor (DSP) code, which supports K56flex, is not configured. The modem will revert to transmitting at 33.6 kbps. D—Modem is currently downloading firmware. p—Firmware download is pending, typically because one or more modems is active. R—Modem is held and isolated in a suspended state by the **modem hold-reset** command. T—Modem is conducting a back-to-back test with another modem. *—Modem is connected or dialing.
Usage	Percentage of the total system uptime that all modems are in use.
Inc calls	Number of incoming calls that successfully and unsuccessfully connected to a modem.
Out calls	Number of outgoing calls that successfully and unsuccessfully dialed out from an available modem.
Busied Out	Number of modems that have been manually removed from service.
Failed Dial	Number of modems that attempted to dial in to the network but failed to make a connection.
No Answer	Number of modems that detected an incoming ring but failed to answer the call.
Succ Pct.	Successful connection percentage of total available modems.

The following example shows the statistics and current configurations for the manageable modem 2/10, which exists on a V.34 modem card in a Cisco AS5200. A dash (-) indicates a field that is not available on basic modems. An *x* indicates a field that is available and active on manageable modems. See Table 68 for a description of the fields displayed by the **show modem** command.

```
Router# show modem 2/10

Mdm  Typ    Status     Tx/Rx     G  Duration  TX  RX  RTS  CTS  DSR  DCD  DTR
2/10 V34    Idle    33600/33600  1  00:00:00           x    x    x         x

Modem 2/10, Microcom MNP10 V34 Modem (Select), Async35, TTY35
Firmware (Boot) Rev: 2.1(9) (1.0(5))
Modem config: Incoming and Outgoing
Protocol: reliable/MNP, Compression: V42bis
Management port config: Status polling and AT session
Management port status: Status polling and AT session
TX signals: 0 dBm, RX signals: 0 dBm
```

```
  Last clearing of "show modem" counters never
    0 incoming completes, 0 incoming failures
    0 outgoing completes, 0 outgoing failures
    0 failed dial attempts, 0 ring no answers, 0 busied outs
    0 no dial tones, 0 dial timeouts, 0 watchdog timeouts
    0 no carriers, 0 link failures, 0 resets 0 recover oob
    0 protocol timeouts, 0 protocol errors, 0 lost events

Connection Speeds          75      300      600     1200     2400     4800
# of connections           0        0        0        0        0        0
Connection Speeds        7200     9600    12000    14400    16800    19200
# of connections           0        0        0        0        0        0
Connection Speeds       21600    24000    26400    28800    31200    33600
# of connections           0        0        0        0        0        1
```

The following is sample output for a basic V.34 modem module. Notice that unavailable fields are marked with dashes (-):

```
Router# show modem 1/1

Mdm  Typ  Status   Tx/Rx       G  Duration  TX  RX  RTS  CTS  DSR  DCD  DTR
1/1   -   Idle    19200/19200  0  00:01:05   -   -   -    -    -    -    -

Modem 1/1, AS5200 Non-Manageable Modem
Firmware (Boot) Rev: Unknown
Modem config: Unknown
Management config: Not Manageable Modem

Last clearing of "show modem" counters never
- incoming completes, - incoming failures
- outgoing completes, - outgoing failures,
0 failed dial attempts, 0 ring no answers, 0 busied outs
0 no dial tones, 0 dial timeouts, 0 watchdog timeouts
- no carriers, - link failures, 0 resets
- protocol timeouts, - protocol errors, - lost events

Connection Speeds          75      300      600     1200     2400     4800
# of connections           0        0        0        0        0        0
Connection Speeds        7200     9600    12000    14400    16800    19200
# of connections           0        0        0        0        0        0
Connection Speeds       21600    24000    26400    28800    31200    33600
# of connections           0        0        0        0        0        0
```

The following is sample output from the **show modem** *slot/port* command for V.110 modem cards:

```
Router# show modem 0/1

Mdm  Typ    Status     Tx/Rx     G  Duration  TX  RX  RTS  CTS  DSR  DCD  DTR
0/1         Idle        -/-      1  00:00:00   -   -   -    -    -    -    -

Modem 0/1, V.110 Terminal Adaptor (Unmanaged), Async2, TTY2
Firmware (Boot) Rev: Unmanaged (Unmanaged)
Modem config: Incoming and Outgoing
Management config: Unmanaged

  Last clearing of "show modem" counters never
    - incoming completes, - incoming failures
    - outgoing completes, - outgoing failures
    0 failed dial attempts, 0 ring no answers, 0 busied outs
    - no dial tones, - dial timeouts, 0 watchdog timeouts
    - no carriers, - link failures, 0 resets, - recover oob
    - protocol timeouts, - protocol errors, - lost events
```

```
Connection Speeds          75      300      600     1200     2400     4800
# of connections           -        -        -        -        -        -
Connection Speeds        7200     9600    12000    14400    16800    19200
# of connections           -        -        -        -        -        -
Connection Speeds       21600    24000    26400    28800    31200    32000
# of connections           -        -        -        -        -        -
Connection Speeds       33600    34000    36000    38000    40000    42000
# of connections           -        -        -        -        -        -
Connection Speeds       44000    46000    48000    50000    52000    54000
# of connections           -        -        -        -        -        -
Connection Speeds       56000
# of connections           -
```

The type of display output generated from the **show modem** *slot/port* command depends on the version of Cisco IOS software running on the router or access server. For example, the following shows example output for a 56K modem card, which carries digital modems that transmit at 56 kbps. (In truth, 56K modems do not modulate or demodulate data. A pure digital-to-digital connection is made.) See Table 68 for a description of the fields displayed by this modem card.

```
Router# show modem 0/0

Mdm  Typ     Status      Tx/Rx      G  Duration  TX  RX  RTS  CTS  DSR  DCD  DTR
0/0          Idle         0/0       0  00:00:00           x    x    x         x

Modem 0/0, Microcom MNP10 K56 Modem (Select), TTY1
Firmware (Boot) Rev: 3.1(16) (3.0(4))
DSP Controller (SPX) Rev: 1.1(0) (1.1(0))
Modem config: Incoming and Outgoing
Protocol: Normal, Compression: None
Management port config: Status polling and AT session
Management port status: Status polling and AT session
TX signals: 0 dBm, RX signals: 0 dBm

  Last clearing of "show modem" counters never
    0 incoming completes, 0 incoming failures
    0 outgoing completes, 0 outgoing failures
    0 failed dial attempts, 0 ring no answers, 0 busied outs
    0 no dial tones, 0 dial timeouts, 0 watchdog timeouts
    0 no carriers, 0 link failures, 1 resets 0 recover oob
    0 protocol timeouts, 0 protocol errors, 0 lost events

Transmit Speed Counters:

Connection Speeds          75      300      600     1200     2400     4800
# of connections           0        0        0        0        0        0
Connection Speeds        7200     9600    12000    14400    16800    19200
# of connections           0        0        0        0        0        0
Connection Speeds       21600    24000    26400    28800    31200    32000
# of connections           0        0        0        0        0        0
Connection Speeds       33600    34000    36000    38000    40000    42000
# of connections           0        0        0        0        0        0
Connection Speeds       44000    46000    48000    50000    52000    54000
# of connections           0        0        0        0        0        0
Connection Speeds       56000
# of connections           0
```

```
Receive Speed Counters:

Connection Speeds          75      300      600     1200     2400     4800
# of connections            0        0        0        0        0        0
Connection Speeds        7200     9600    12000    14400    16800    19200
# of connections            0        0        0        0        0        0
Connection Speeds       21600    24000    26400    28800    31200    32000
# of connections            0        0        0        0        0        0
Connection Speeds       33600    34000    36000    38000    40000    42000
# of connections            0        0        0        0        0        0
Connection Speeds       44000    46000    48000    50000    52000    54000
# of connections            0        0        0        0        0        0
Connection Speeds       56000
# of connections            0
```

Table 68 describes the fields in the previous four displays, which were created using the **show modem** *slot/port* command. This table applies to all modem module types.

Table 68 show modem slot/port Field Descriptions

Field	Description
Mdm	Slot and modem number.
Typ	Modulation type, which can be any of the following values: Bel103, Bel212, V21, V22, V22bis, V23, V32, V32bis, VFC, V34, V17, V27, V33, and K56Flx.
Status	Current status of the modem. Possible values include: • Conn—Modem is connected to a remote host. • B—Inoperable state, which is configured by the **modem bad** command. • B*—Inoperable state, which is configured by the **modem startup-test** command during initial power-up testing. • b—Modem is busied out. This can be manually configured by the **modem busyout** line configuration command. • Reset—Modem is in reset mode. • D/L—Modem is downloading firmware. • Bad FW—Downloaded modem firmware is not operational. • Busy—Modem is out of service and not available for calls. • Idle—Modem is ready for incoming and outgoing calls.
Tx/Rx	Transmission and receiving speed for the most recently connected call.
G	Modem group number assigned to the modem. The group number 0 means the modem is not part of any group.
Duration	Time duration, in hours: minutes: seconds, of the current call or the last call.

Table 68 show modem slot/port Field Descriptions (continued)

Field	Description
Modem functions	The following modem functions are displayed on manageable modems. A field that is available and turned on is marked with an *x*. An unavailable field is marked with a dash (-). TX—Transmit Data. The DTE device transmits data to the DCE device. RX—Receive Data. The DCE device receives data from the DTE device. RTS—Request To Send. The DTE device signals to the DCE device that the DTE device accepts data into its buffers. CTS—Clear To Send. The DCE device signals to the DTE device that the DCE device accepts data into its buffers. DSR—Data Set Ready. The modem is ready to start communication. DCD—Data Carrier Detect. The DCE device indicates to the DTE device that a call is present and established with a remote modem. Dropping the DCD function terminates the session. DTR—Data Terminal Ready. The DTE device indicates to the DCE device that it accepts calls.
Firmware	Installed modem firmware.
Modem config	Current modem configuration, which includes the fields Incoming, Outgoing, Incoming and Outgoing, and Unknown.
Protocol	Protocol the modem is running such as Normal, Direct, reliable/Microcom Network Protocol (MNP) 4, and reliable/Link Access Procedure for Modems (LAPM).
Compression	Compression algorithm running on the modem, such as None, V42*bis*, and MNP5.
Management config	Indicates if the modem is configured for out-of-band feature polling.
TX signals	Transmit signal levels. For modulations that do not support signal to noise calculations, the ratio is 0.
RX signals	Transmit signal levels.

Table 68 show modem slot/port Field Descriptions (continued)

Field	Description
Last clearing of "show modem" counters	Last time the modem's counters were cleared using the **clear modem counters** command. A summary of modem events also appears. • Incoming completes and failures—Total number of incoming connection requests that the modem answered and successfully or unsuccessfully connected with the remote DCE device. • Outgoing completes and failures—Total number of outgoing connection requests that the modem dialed and successfully or unsuccessfully connected with the remote DCE device. • Failed dial attempts—Number of times the modem attempted to dial out but the call failed to leave the modem. • Ring no answers—Number of times the integrated modem detected ringing but did not answer the incoming call. • Busied outs—Number of times the integrated modem was intentionally taken out of service (for example, the **modem busyout** command was enabled on the modem). • No dial tones—Number of times the dial-out attempt failed because the modem failed to detect a dial tone. • Dial timeouts—Number of times the modem has timed out while attempting to dial. • Watchdog timeouts—Number of times the modem internal watchdog timer has expired. • No carriers—Number of times the modem disconnected because no carrier was present. • Link failures—Number of times the modem has detected a link failure. • Resets—Number of times the modem has been reset. • recover oob—Number of times the out-of-band feature has been cleared and re-initialized. • Protocol timeouts and errors—Number of times the modem protocol failed to make a call connection. • Lost events—Number of incomplete modem events performed by the modem.
Transmit Speed Counters:	List of connection speeds that were sent by the modem.
Receive Speed Counters:	List of connection speeds that were received by the modem.
Connection Speeds # of connections	A complete summary of possible connection speeds and the actual number of connections that occurred at those speeds. Depending on which modem port module and version of software you are running, possible connection speeds range from 75 to 56,000 bits per second (bps). The number of successful connections is displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps: Connection Speeds 56000 # of connections 3

The following example shows the output for modem group 1, which comprises modem 1/0 through modem 1/23:

```
Router# show modem group 1

              Incoming calls       Outgoing calls    Busied   Failed  No    Succ
Grp  Usage  Succ    Fail  Avail   Succ    Fail  Avail  Out      Dial    Ans   Pct.
1     0%     0       0     24      0       0     24       0        0    0     0%

Modem Group 1: 1/0, 1/1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, 1/8, 1/9, 1/10, 1/11, 1/12, 1/13,
1/14, 1/15, 1/16, 1/17, 1/18, 1/19, 1/20, 1/21, 1/22, 1/23
```

Related Commands

Command	Description
show modem version	Displays version information about the modem firmware, controller and DSP code (for 56-kbps modems only), and boot code.

show modem at-mode

To display a list of the manageable Microcom modems that have open modem attention (AT) sessions and a list of users logged in to those sessions, use the **show modem at-mode** command in EXEC mode.

show modem at-mode

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

The report from the **show modem at-mode** command is self explanatory. The following output shows that modem 1/1 has one open AT directly connected session:

```
Router# show modem at-mode

Active AT-MODE management sessions:
Modem    User's Terminal
1/1 0    cty 0
```

show modem bundled-firmware

To display a a list of available modem firmware running in a Cisco AS5800 access server, use the **show modem bundled-firmware** command in EXEC mode.

show modem bundled-firmware

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.3(5)AA	This command was introduced.

Usage Guidelines

Use this command instead of the the **show modem mapping** command on the Cisco AS5800 access servers. The **show modem bundled-firmware** command is useful for displaying a list of available modem firmware running in the access server.

Examples

The report from the **show modem bundled-firmware** command is self explanatory. The following sample output shows firmware images by slot number:

```
Router# show modem bundled-firmware

List of bundled modem firmware images by slot
  Slot 4
    2.6.2.0
  Slot 5
    2.6.2.0
  Slot 6
    2.6.2.0
  Slot 7
    2.6.2.0
  Slot 8
    2.6.2.0
```

Related Commands

Command	Description
copy	Copies any file from a source to a destination, including a source or destination URL for a TFTP network server, or for Flash memory.
copy modem	Copies modem firmware to integrated modems in an access server.
show modem mapping	Displays a snapshot of all the firmware versions running on all the modems in access servers besides the AS5800.

show modem call-stats

To display the local disconnect reasons for all modems inside an access server or router, use the **show modem call-stats** command in EXEC mode.

show modem call-stats [*slot*]

Syntax Description

slot	(Optional) Slot number, which limits the display output to a particular range of modems in the system.

Command Modes

EXEC

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

Use this command to find out why a modem ended its connection or why a modem is not operating at peak performance.

Local disconnect reasons for a particular modem are listed across the top of the screen display. For example, see lostCarr, dtrDrop, rmtLink, wdogTimr, compress, retrain, inacTout, and linkFail in the following output:

```
Router# show modem call-stats

  dial-in/dial-out call statistics

       lostCarr  dtrDrop  rmtLink wdogTimr compress  retrain inacTout linkFail
  Mdm
* 0/0
* 0/1
```

In the body of the screen display, the number of times an error occurred on a specific modem is displayed (see the # column). The % column shows the total running percent that a modem was logged for the specified disconnect reason with respect to the entire modem pool. For example, out of all the times that the lostCarr error occurred on all the modems in the system, the lostCarr error occurred 2 percent of the time on modem 0/0.

```
Router# show modem call-stats

  dial-in/dial-out call statistics

       lostCarr  dtrDrop  rmtLink wdogTimr compress  retrain inacTout linkFail
  Mdm     #   %    #   %    #   %    #   %    #   %    #   %    #   %    #   %
* 0/0     6   2    2   3    1   0    0   0    0   0    0   0    0   0    0   0
* 0/1     5   2    2   3    2   1    0   0    0   0    0   0    0   0    0   0
```

Bad or malfunctioning modems are detected by an unusually high number of disconnect counters for a particular disconnect reason. For example, if modem 1/0 had an astronomically high number of compression errors compared to the remaining modems in system, modem 1/0 would probably be bad or inoperable.

To reset the counters displayed by the **show modem call-stats** command, issue the **clear modem counters** command.

Note Remote disconnect reasons are not described by this command.

Examples

The following example shows call statistics for the **show modem call-stats** command. Because of the screen size limitation of most terminal screen displays, all the possible disconnect reasons cannot be displayed at the same time. Only the top eight most frequently experienced disconnect reasons are displayed.

```
Router# show modem call-stats

  dial-in/dial-out call statistics

       lostCarr  dtrDrop  rmtLink wdogTimr compress  retrain inacTout linkFail
  Mdm     #   %    #   %    #   %    #   %    #   %    #   %    #   %    #   %
* 0/0     6   2    2   3    1   0    0   0    0   0    0   0    0   0    0   0
* 0/1     5   2    2   3    2   1    0   0    0   0    0   0    0   0    0   0
  0/2     5   2    2   3    4   3    0   0    0   0    0   0    0   0    0   0
* 0/3     5   2    2   3    2   1    0   0    0   0    0   0    0   0    0   0
* 0/4     5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/5     5   2    2   3    2   1    0   0    0   0    0   0    0   0    0   0
* 0/6     4   1    2   3    2   1    0   0    0   0    0   0    0   0    0   0
* 0/7     4   1    2   3    4   3    0   0    0   0    0   0    0   0    0   0
* 0/8     6   2    1   1    3   2    0   0    0   0    0   0    0   0    0   0
* 0/9     5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/10    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 0/11    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
  0/12    5   2    2   3    2   1    0   0    0   0    0   0    0   0    0   0
* 0/13    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/14    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/15    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/16    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/17    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 0/18    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 0/19    5   2    1   1    3   2    0   0    0   0    0   0    0   0    0   0
* 0/20    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/21    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 0/22    5   2    1   1   11  10    0   0    0   0    0   0    0   0    0   0
* 0/23    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/0     4   1    2   3    2   1    0   0    0   0    0   0    0   0    0   0
* 2/1     5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/2     5   2    2   3    0   0    0   0    0   0    0   0    0   0    0   0
* 2/3     5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/4     5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/5     5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/6     4   1    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 2/7     5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 2/8     5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 2/9     4   1    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/10    5   2    1   1    0   0    0   0    0   0    0   0    0   0    0   0
* 2/11    5   2    1   1    5   4    0   0    0   0    0   0    0   0    0   0
* 2/12    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/13    5   2    1   1    1   0    0   0    0   0    0   0    0   0    0   0
* 2/14    5   2    1   1    2   1    0   0    0   0    0   0    0   0    0   0
* 2/15    4   1    1   1    3   2    0   0    0   0    0   0    0   0    0   0
* 2/16    4   1    1   1    3   2    0   0    0   0    0   0    0   0    0   0
* 2/17    5   2    2   3    9   8    0   0    0   0    0   0    0   0    0   0
* 2/18    4   1    1   1    1   0    0   0    0   0    0   0    0   0    0   0
```

```
* 2/19     3   1     1   1     2   1     0   0     0   0     0   0     0   0     0   0
* 2/20     7   3     1   1     8   7     0   0     0   0     0   0     0   0     0   0
* 2/21     5   2     1   1     1   0     0   0     0   0     0   0     0   0     0   0
* 2/22     4   1     1   1     2   1     0   0     0   0     0   0     0   0     0   0
* 2/23     5   2     1   1     2   1     0   0     0   0     0   0     0   0     0   0
 Total   233        59       110         0         0         0         0         0
```

dial-out call statistics

```
          noCarr noDitone      busy     abort dialStrg autoLgon dialTout   rmtHgup
  Mdm      #   %    #   %     #   %     #   %     #   %     #   %     #   %     #   %
* 0/0      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/1      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
  0/2      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/3      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/4      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/5      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/6      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/7      5   5    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/8      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/9      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/10     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/11     5   5    0   0     0   0     0   0     0   0     0   0     0   0     0   0
  0/12     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/13     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/14     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/15     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/16     2   2    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/17     4   4    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/18     5   5    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/19     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/20     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/21     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/22     5   5    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 0/23     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/0      2   2    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/1      3   3    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/2      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/3      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/4      0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/5      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/6      1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/7      4   4    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/8      7   8    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/9      4   1    1   1     2   1     0   0     0   0     0   0     0   0     0   0
* 2/10     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/11     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/12     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/13     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/14     4   4    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/15     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/16     1   1    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/17     5   5    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/18     5   5    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/19     3   3    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/20     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/21     4   4    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/22     2   2    0   0     0   0     0   0     0   0     0   0     0   0     0   0
* 2/23     0   0    0   0     0   0     0   0     0   0     0   0     0   0     0   0
 Total    84        0         0         0         0         0         0         0
```

Table 69 describes the significant fields shown in the display.

Table 69 show modem call-stats Field Descriptions

Field	Description
dial-in/dial-out call statistics	This category of disconnect reasons can happen only in dial-in or dial-out scenarios.
wdogTimr	Watchdog timeout. An obscure firmware problem occurred. This is a rare disconnect reason.
compress	Compression. An error was detected during decompression, which caused the internal decompression dictionary to overflow. This could be caused by a modem dialing in that is using a slightly different compression algorithm.
retrain	Retrain failure. A connection was lost and not reestablished after three attempts.
inacTout	Inactivity timeout. The time specified in the AT/T command has expired. No modem data transfers were detected during that period.
linkFail	Link failure. The protocol level link failed while using Microcom Network Protocol (MNP)-10 or Link Access Procedure for Modems (LAPM) in reliable mode.
moduFail	Modulation error. An error was detected at the Digital Signal Processor (DSP) chip level, which caused a disconnect.
mnpProto	MNP10 protocol error. An uncorrectable error occurred during a MNP-10 connection.
lapmProt	LAPM protocol error. An uncorrectable error occurred during a LAPM connection.
lostCarr	Lost carrier. The modem firmware detected a carrier drop during a connection. The cause for the carrier drop could be the loss of signal from the remote modem or the result of a error detection.
dtrDrop	DTR drop. The modem disconnected because the DTR signal from the host became inactive.
userHgup	User hang up. The modem disconnected because a command such as ATH was detected.
rmtlink	Remote link disconnect. If an MNP-10 reliable link is established, the remote modem sends the disconnect reason across the link before disconnecting. The disconnect reason displayed is LOCAL (remote link disconnect) and REMOTE (the reason the remote modem disconnected).
trminate	Terminate. A password security error occurred in the Microcom High Density Management System (HDMS). This error occurs only with Microcom modems.
callBkfa	Callback failed. This error applies to leased line connections only. A switched line connection failed and a connection still cannot be made on the leased line.
dial-out call statistics	This category of disconnect reasons can happen only in a dial-out scenario.
noCarr	No carrier. The called number answered, but no answer tone was detected after the appropriate wait.
noDitone	No dial tone. No dial tone was detected after the modem went off hook.

Table 69 show modem call-stats Field Descriptions (continued)

Field	Description
busy	Busy. A busy signal was detected while the local modem was attempting to dial.
abort	Abort. A character was received from the remote host after the dial command was issued and before a connection was established.
dialStrg	Dial string error. An invalid character was detected in the dial string, which forced the dial attempt to terminate.
autoLgon	Autologon error. An autologon sequence did not successfully complete.
dialTout	Dial timeout. When a semicolon is used as a dial modifier, the modem returns to the command state as indicated by an "OK." This allows a continuation of the dial string. If a period of time elapses as specified in the S7 register without the dial string completing, the attempt is aborted with dial timeout as the disconnect reason.
rmtHgup	Remote hang-up. The modem disconnected because the remote modem disconnected the call and dropped DTR.
blacklst	Blacklist. In a country that supports blacklisting, an attempt was made to go off hook with a null dial string (ATD).
ccpNssn	CCP not seen. The credit card prompt (also known as Bong) was not detected.
faxClasz	Fax class 2 error. An abnormal termination to a fax transmission was detected.
Total	Total number of times the disconnect reason occurred among all the modems in the system.

show modem calltracker

To display all information stored within the Call Tracker active or history database for the latest call assigned to a specified modem, use the **show modem calltracker** command in privileged EXEC mode.

show modem calltracker [*slot*/*port*]

Syntax Description

slot/*port*	(Optional) Location of a slot and modem port. Remember to include the slash mark when entering this argument.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

This command allows you to display all Call Tracker data for a given modem when you do not have the call handle readily available and do not want to search the Call Tracker database.

Examples

```
Router# show modem calltracker 1/1

-------------------------- call handle=0000000058 --------------------------
status=Active, service=PPP, origin=Answer, category=Modem
DS0 slot/cntr/chan=0/0/22, called=71071, calling=6669999
userid=router5200, ip=172.19.4.2, mask=255.255.255.0
setup=10/16/1999 18:29:20, conn=0.10, phys=17.00, service=24.71, authen=24.71
init rx/tx b-rate=28800/33600, rx/tx chars=0/0
resource slot/port=1/1, mp bundle=0, charged units=0, account id=75
idb handle=0x6185B968, tty handle=0x612F8598, tcb handle=0x0
------------------------------------------------------------------------------
protocol: last=LAP-M, attempted=LAP-M
compression: last=V.42bis-Both, supported= V.42bis-RX V.42bis-TX
standard: last=V.34+, attempted=V.34+, initial=V.34+

snr=35 dB, sq=3, rx/tx level=-16/-15 dBm
phase jitter: freq=0 Hz, level=0 degrees
far end echo level=-83 dBm, freq offset=0 Hz
phase roll=-99 degrees, round-trip delay=1 msecs
digital pad=None dB, digital pad comp=0
rbs pattern=0, constellation=16 point
rx/tx: symbol rate=3429/3429, carrier freq=1959/1959
rx/tx: trellis code=0/0, preemphasis index=6/0
rx/tx: constellation shape=Off/On, nonlinear encode=Off/On
rx/tx: precode=Off/On, xmit level reduct=2/2 dBm

rx/tx: chars=0/0, general info=0x0
rx/tx: link layer chars=0/0, NAKs=0/0
error corrected: rx/tx=0/0, rx bad=0
ec retransmissions=0, retransmitted frames=0
rx/tx ppp slip=0/0, bad ppp slip=0
```

```
rx/tx b-rate: last=28800/33600, lowest=28800/33600, highest=28800/33600
phase 2 projected max rx b-rate: client=19200, host=24000
phase 4 desired rx/tx b-rate: client=28800/33600, host=28800/33600
retrains: local=0, remote=0, failed=0
speedshift: local up/down=0/0, remote up/down=0/0, failed=0

v110: rx good=0, rx bad=0, tx=0, sync lost=0
SS7/COT status=0x00
v90: status=No Attempt, client=(n/a), failure=None

rx/tx: max neg I frame=128/128, neg window=15/15
v42bis size: dictionary=1024, string=64
T401 timeouts=0, tx window closures=0, rx overruns=0
test err=0, reset=0, v0 synch loss=0
mail lost: host=0, sp=0

duration(sec)=16, disc reason=0x0
disc text=(n/a)

                --------5---------10--------15--------20--------25--------30
line shape  : 0x19202121202021202020212020202020202020201F1D191100
v8bis capab : 0x00000000000000000000000000000000000000000000000000
v8bis mod sl: 0x00000000000000000000000000000000000000000000000000
v8 jnt menu : 0x01E0C14513942A0000000000000000000000000000000000
v8 call menu: 0x01C14513942A0000000000000000000000000000000000
v90 training: 0x00000000
v90 sgn ptrn: 0x00000000
state trnsn : 0x000102030410204042 43FF0000000000000000000000000000000000000000
                0000
portwre diag: 0x00000000000000000000000000000000
phase 2 info: 0x010000F4EF221FF37E0001E4EFA21FF2E30001A4EF980101B7CF98003C00
                00000024EF40000502160AE0304DFFFECE07A707A70D650D6500
phase 4 info: 0x01834070808340708000
--------------------------------------------------------------------------------
```

Related Commands

Command	Description
show call calltracker active	Displays all information stored within the Call Tracker active database for all active calls.
show call calltracker handle	Displays the detailed data stored within Call Tracker for a specific call having a specified unique call handle identifier.
show call calltracker history	Displays all the information stored within the Call Tracker history database table for the most recent disconnected calls.

show modem configuration

To display the current modem configuration for digital MICA technologies modems loaded inside an access server or router, use the **show modem configuration** command in EXEC mode.

show modem configuration [*slot*/*port*]

Syntax Description

slot/*port*	(Optional) Slot and modem port location. If this number is not specified, statistics for all connected modems are displayed. (Include the forward slash (/) when entering this argument.)

Command Modes

EXEC

Command History

Release	Modification
11.2 P	This command was introduced.
12.1(5)T	This command was enhanced to display information about digital modems on the Cisco 3600 series router that support V.110.

Examples

The following is sample output from the **show modem configuration** command. A specific modem, 0/0, has been designated. V.110 information is highlighted in this example.

```
Router# show modem configuration 0/0

  S-Reg   Value   Meaning
 ---|---|----------------
    S-- = 1       Country Code is Default u-law
    S00 = 0       Auto Answer immediately
    S01 = 0       Reserved
    S02 = 43      escape character is 0x2B or '+'
    S03 = 13      carriage return character is 0xD
    S04 = 10      line feed character is 0xA
    S05 = 8       backspace character is 0x8
    S06 = 2       pause 2 seconds before blind dialing
    S07 = 60      wait up to 60 seconds for carrier after dialing
    S08 = 2       comma adds 2 second dial delay
    S09 = 317     BitMap register value = 0x13D
    S10 = 14      1.4 second delay for hangup after carrier loss
    S11 = 0       In Answer Mode
    S12 = 3       3 Data Bits
    S13 = 3       Space Parity
    S14 = 1       1 Stop Bits
    S15 = 1       V.42 ODP generation enabled
    S16 = 50      5.0 second Error Correction autodetect timeout
    S17 = 100     10.0 second Error Correction negotiation timeout
    S18 = 13      Error Correction fallback char is 0xD
    S19 = 12      Error Correction retransmission limit is 12
    S20 = 256     Error Correction frame length is 256 octets
    S21 = 3       V42bis or MNP Data Compression
    S22 = 0       ARA Error Correction is disabled
    S23 = 1       V.42 Error Correction enabled
    S24 = 1       MNP Error Correction enabled
```

```
S25 = 0       Link Protocol Fallback to Async framing
S26 = 0       Using TDM slice 0
S27 = 0       Calling Tone disabled
S28 = 0       Guard Tone disabled
S29 = 8       V.110 modem standard
S30 = 33600   Maximum connect rate of 33600 bps
S31 = 300     Minimum connect rate of 300 bps
S32 = 2       Bit Errors >= 1:1000 cause recovery
S33 = 500     Fallback/Fallforward Squelch Timer is 500ms
S34 = 2000    Fall Forward Timer is 20.0 seconds
S35 = 50      Fall Back Timer is 0.50 seconds
S36 = 20      Terminate timeout is 20 seconds
S37 = 60      Wait 60 seconds for data mode timeout
S38 = 14      1.4 second lost carrier to hang-up delay
S39 = 7       Transmit level setting of -13dBm
S40 = 4       4 consecutive retrains cause link disconnect
S41 = 5       V.34 maximum symbol rate of 3429 baud
S42 = 0       V.34 minimum symbol rate of 2400 baud
S43 = 2       V.34 carrier frequency is Auto Selection
S44 = 11      V.34 Preemphasis filter selection is Automatic
S45 = 0       Null transmit and receive Signalling Type
S46 = 0       No call progress tone detection
S47 = 2       +++ escape detection enabled for originate mode only
S48 = 1       AT command processor enabled
S49 = 0       no call setup delay
S50 = 60000   Maximum PCM connect rate of 60000 bps
S51 = 28000   Minimum PCM connect rate of 28000 bps
S52 = 1       Digital Pad Compensation is enabled
S53 = 3       V.8bis is enabled
S57 = 2400    User rate for V.110 connection is 2400 bps
configuration index = 59, value = 0x3
```

The following example uses the **show modem configuration** command to display the configuration for modem 0/1, which resides in slot 0/1 of a Cisco AS5300:

```
Router# show modem configuration 0/1

 Modem(0/1) Configuration Block:
 Country Code: 1
 Originate/Answer Mode: Answer
 Data Bits Selection: 8
 Parity Selection: 0
 Stop Bits Selection: 1
 V.42 ODP generation: Generate ODP sequence when originating a call
 Error Correction Autodetect Time-out value: 5000 ms
 Protocol Negotiation Time-out value: 10000 ms
 Protocol Negotiation Fallback Character:
 Protocol Negotiation Retransmission Limit: 12
 Error Correction Frame Length: 256 bytes
 Data Compression: V.42bis and MNP5
 ARA Error Correction: ARA1.0 & ARA2.0 Enabled for Answer only
 V.42 Error Correction: V.42(LAP-M) Originate&Answer enabled
 MNP Error Correction: MNP Originate&Answer enabled
 Link Protocol Fallback: Asynchronous Framing (Start/Stop/Parity)
 DSP processor MVIP TDM slice: 0
 Calling Tone: Disabled
 Guard Tone: Disabled
 Modem Standard: V.34bis Automode, with terbo
 Max. Connect Rate: 33600 bps
 Min. Connect Rate: 300 bps
 Signal Quality Threshold: Bit Errors >=1:1000 cause recovery
 Fallback/Fallforward Squelch Timer: 500 ms
 Fall Forward Timer: 10000 ms
 Fall Back Timer: 500 ms
```

```
Terminate Time-out: 20 second(s)
Wait For Data Mode Time-out: 40 second(s)
Lost Carrier To Hang-up Delay: 1400 ms
Transmit Level Setting: -13 dBm
Retrain Limit: 4
V.34 Max. Symbol Rate: 3249 Baud
V.34 Min. Symbol Rate: 2400 Baud
V.34 Carrier Frequency: Auto Carrier Selection
V.34 Preemphasis Filter Selection: 11
Tx and RX Signaling Type: NULL signaling
Call Progress Tone Detection: No tone detection
+++ Escape Detection: Enabled-Originate-Mode-Only
AT Command Processor: Enabled
Call Set Up Delay: no delay before link initiation
Automatic Answer: delay 1 second(s)
Escape Detection Character: ASCII 43 ('+')
Carriage Return Character: ASCII 13 (CR)
Line Feed Character: ASCII 10 (LF)
Backspace Character: ASCII 8 (BS)
Pause Before Blind Dialing: 2 second(s)
Wait For Carrier After Dial: 40 second(s)
Comma Dial Modifier Time: 2 second(s)
Bit-mapped Register(S9=0x13D): E1Q2V1&D3X4
Delay For Hangup After Carrier Loss: 1400 ms
```

Table 70 describes the significant fields shown in the displays.

Table 70 show modem configuration Field Descriptions for MICA Modems

Field	Description
Modem slot/port	Slot and port for the specified modem.
Country Code:	Transmit level limits with respect to the S39 register. Default is 1 (U.S. domestic).
Originate/Answer Mode:	Answer or originate. Default is answer.
Data Bits Selection:	7, 8, or 9 data bits. Default is 8.
Parity Selection:	0 = no parity, 1 = even parity, 2 = odd parity. Default is no parity.
Stop Bits Selection:	1 or 2 stop bits. Default is 1 stop bit.
V.42 ODP generation:	Disabled or generate ODP sequence when originating a V.42 call. Default is Generate ODP sequence when originating a V.42 call.
Error Correction Autodetect Time-out value:	Maximum period, in milliseconds, during which the modem will run an automated detection machine upon the incoming data. Default is 5000 ms.
Protocol Negotiation Time-out value:	Maximum wait, in milliseconds, for error correction protocol negotiation before fallback. Default is 10,000 ms.
Protocol Negotiation Fallback Character:	0 to 127. Default is 13.
Protocol Negotiation Retransmission Limit:	0 = Do not disconnect on excessive retransmission; 1 to 255 = number of successive retransmissions to cause disconnect. Default is 12.
Error Correction Frame Length:	Buffer length; 64 to 1024 octets of data. Default is 256.

Table 70 show modem configuration Field Descriptions for MICA Modems (continued)

Field	Description
Data Compression:	Disabled, V.42bis, Microcom Network Protocol (MNP) 5, or V.42bis or MNP5 (V.42 has precedence). Default is V.42bis or MNP5 (V.42 has precedence).
ARA Error Correction:	ARA1.0 & ARA2.0 Disabled, Enabled for Answer only, Enabled for Answer originate ARA1.0, and Enabled for Answer originate ARA2.0. Default is Enabled for Answer only.
V.42 Error Correction:	V.42(LAP-M) (Link Access Procedure for Modems) Disabled, V.42(LAP-M) Originate&Answer enabled. Default is disabled.
MNP Error Correction:	MNP Disabled or MNP Originate and Answer enabled. Default is MNP Originate and Answer enabled.
Link Protocol Fallback:	Asynchronous framing (Start/Stop/Parity), Synchronous framing, Raw 8 bits to Digital Signal Processor (DSP), or Disconnect (Hang-up). Default is Asynchronous framing (Start/Stop/Parity).
DSP processor MVIP TDM slice:	0 to 15.
Calling Tone:	Disable or Send calling tone. Default is disable.
Guard Tone:	Guard tone disabled, Use Guard tone (V.22 and V.22bis only). Default is disabled.
Modem Standard:	V.34bis Automode with terbo, V.34bis Automode skip terbo, V.32 terbo Automode, V.32bis Automode, V.22bis Automode, or K56Flex 1.1. Default is V.34bis Automode with terbo.
Max. Connect Rate:	75 to 56000 bits per second (bps).
Min. Connect Rate:	75 to 56000 bps.
Signal Quality Threshold:	No action on bit errors, Bit Errors >=1:100 cause recovery, Bit Errors >=1:1000 cause recovery, Bit Errors >=1:10000 cause recovery, Bit Errors >=1:100000 cause recovery, or Bit Errors >=1:1000000 cause recovery. Default is 1:1000.
Fallback/Fallforward Squelch Timer:	Time to delay after a speed shift before allowing another speed shift. Default is 500 ms.
Fall Forward Timer:	Elapsed time, in milliseconds, with continuous good signal quality to cause a fall forward. Default is 10,000 ms.
Fall Back Timer:	Elapsed time, in milliseconds, with bad signal quality to cause a fallback. Default is 500 ms.
Terminate Time-out:	Elapsed time, in milliseconds, after a disconnect request before forcing a link disconnect. During this period, the modem sends buffered data and then clears down the link. Default is 20 seconds.
Wait for Data Mode Time-out:	Maximum time, in milliseconds, during link establishment before disconnection. Default is 40; 60 for K56Flex.
Lost Carrier To Hang-up Delay:	Maximum time, in milliseconds, without a carrier to cause the link disconnect. Default is 1400 ms.
Transmit Level Setting:	6dBm, 7dBm, 8dBm, -20dBm, or -21dBm. Default is 9 dBm.
Retrain Limit:	Maximum successive failed retrains to cause the link to disconnect. Default is 4.

Table 70 show modem configuration Field Descriptions for MICA Modems (continued)

Field	Description
V.34 Max. Symbol Rate:	2400 baud, 2743 baud, 2800 baud, 3000 baud, 3200 baud, or 3429 baud. Default is 3429 baud.
V.34 Min. Symbol Rate:	2400 baud, 2743 baud, 2800 baud, 3000 baud, 3200 baud, or 3429 baud. Default is 2400 baud.
V.34 Carrier Frequency:	Low Carrier, High Carrier, or Auto Carrier Selection. Default is High Carrier.
V.34 Preemphasis Filter Selection:	0 to 10 = a selected filter; 11 = Automatic Preemphasis Selection. Default is 11.
Tx and Rx Signaling Type:	NULL signaling, MF signaling, DTMF signaling, Lower band R2 signaling, Upper band R2 signaling, or R1 signaling. Default is NULL signaling.
Call Progress Tone Detection:	No tone detection, Dial tone detection, Ring-Back tone detection, or Busy tone detection. Default is no tone detection.
+++ Escape Detection:	Disabled, Enabled, or Enabled-in-Originate-Mode-Only. Default is Enabled-in-Originate-Mode-Only.
AT Command Processor:	Disabled or Enabled. Default is disabled.
Call Set Up Delay:	No delay before link initiation, delay value (1 to 255). Default is no delay.
Automatic Answer:	Answer immediately, delay value (1 to 255 seconds). Default is 1 second.
Escape Detection Character:	ASCII value (0 to 127). Default is 43.
Carriage Return Character:	ASCII value (0 to 127). Default is 13.
Line Feed Character:	ASCII value (0 to 127). Default is 10.
Backspace Character:	ASCII value (0 to 127). Default is 8.
Pause Before Blind Dialing:	2 to 255 seconds. Default is 2.
Wait For Carrier After Dial:	Wait for data mode timeout (in seconds).
Comma Dial Modifier Time:	2 to 255 seconds. Default is 2.
Bit-mapped Register(S9=0x13D):	Bit mapped register.
Delay For Hangup After Carrier Loss:	Lost carrier to hang-up delay.

Related Commands

Command	Description
show modem log	Displays the modem history event status performed on a manageable modem or group of modems.
show modem mica	Displays information about MICA technologies digital modems.
show modem operational-status	Displays the current modem operational status for MICA technologies digital modems loaded in access servers or routers.

show modem connect-speeds

To display connection speed statistics for all the modems running in an access server or router, use the **show modem connect-speeds** command in EXEC mode.

show modem connect-speeds [*max-speed* [*slot*]]

Syntax Description

max-speed	(Optional) Maximum speed you want displayed in the shifting speed window. You can specify from 12000 to 56000 bits per second (bps), and the default is 12000 bps.
slot	(Optional) Slot number, which limits the display output to a particular range of modems in the system.

Defaults

The maximum speed displayed is 12000 bps.

Command Modes

EXEC

Command History

Release	Modification
11.3	This command was introduced.
12.1(5)T	This command was enhanced to display information about digital modems on the Cisco 3600 series routers that support V.110.

Usage Guidelines

Because most terminal screens are not wide enough to display the entire range of connection speeds at one time (for example, 75 to 56000 bps), the *max-speed* variable is used. This variable specifies the contents of a shifting baud-rate window, which provides you with a snapshot of modem connection speeds for your system. If you want to display a snapshot of lower baud rates, specify a lower connection speed. If you want to see a snapshot of higher baud rates, specify a higher connection speed.

The Cisco IOS software rounds up the *max-speed* variable to the nearest recognizable baud rate, so you need not memorize or enter exact connection speeds. For example, if you enter a maximum baud rate of 22059, the system software automatically rounds the value up to 24000.

To display a complete picture of all the connection speeds and counters on the system, you must enter a series of commands. Each time you issue the **show modem connect-speeds** *max-speed* command, only nine baud rate columns can be displayed at the same time.

Table 71 shows a range of commands that you can issue, one at a time, to display a complete picture of the total possible connection speeds on your access server.

Table 71 Connect Speed Displays for the show modem connect-speeds Command

Command	Connect Speed Range Displayed
show modem connect-speeds 56000	40000 to 56000 bps
show modem connect-speeds 38000	24000 to 38000 bps

Table 71 Connect Speed Displays for the show modem connect-speeds Command (continued)

Command	Connect Speed Range Displayed
show modem connect-speeds 21600	2400 to 21600 bps
show modem connect-speeds 1200	75 to 1200 bps

Note The Cisco IOS software does not accept commas (,) in the connect speed field. For example, enter **28000** not **28,000**.

The **show modem connect-speeds** command displays a log of connection speed statistics starting from the last time the access servers or router was power cycled or the **clear modem counters** command was issued. If you want to create a monthly report of the connection speeds achieved by the modems, issue the **clear modem counters** command at the beginning of the month and issue the **show modem connect-speeds** command at the end of the month.

Examples

The following is sample output from the **show modem connect-speeds** command on a Cisco 3600 series router:

```
Router# show modem connect-speeds

  Codes:
  * - Modem has an active call
  R - Modem is being Reset
  D - Download in progress
  B - Modem is marked bad and cannot be used for taking calls
  b - Modem is either busied out or shut-down

  Transmit connect speeds

   Mdm       75    300    600   1200   2400   4800   7200   9600  12000 TotCnt
* 0/0        0      0      0     36     35     61      0      0      0    132
* 0/1        0      0      0      1      0      0      0      0      0      1
  0/2        0      0      0     48     45     37      0      0      0    130
* 0/3        0      0      0     86     36      4      0      0      0    126
* 0/4        0      0      0      0      0      1      0      0      0      1
  0/5        0      0      0     20     33     78      0      0      0    131
* 0/6        0      0      0     25     57     49      0      0      0    131
  0/7        0      0      0     47     48     36      0      0      0    131
b 0/8        0      0      0      0      0      0      0      0      0      0
!.
!.
!.
b 0/29       0      0      0      0      0      0      0      0      0      0
 Tot         0      0      0    263    254    266      0      0      0    783
 Tot %       0      0      0     33     32     33      0      0      0

  Receive connect speeds

   Mdm       75    300    600   1200   2400   4800   7200   9600  12000 TotCnt
* 0/0        0      0      0     36     35     61      0      0      0    132
* 0/1        0      0      0      1      0      0      0      0      0      1
  0/2        0      0      0     48     45     37      0      0      0    130
* 0/3        0      0      0     86     36      4      0      0      0    126
* 0/4        0      0      0      0      0      1      0      0      0      1
  0/5        0      0      0     20     33     78      0      0      0    131
* 0/6        0      0      0     25     57     49      0      0      0    131
  0/7        0      0      0     47     48     36      0      0      0    131
```

```
b 0/8       0      0      0      0      0      0      0      0      0      0
!.
!.
!.
b 0/29      0      0      0      0      0      0      0      0      0      0
 Tot        0      0      0    263    254    266      0      0      0    783
 Tot %      0      0      0     33     32     33      0      0      0

Router# show modem connect-speeds ?

  <12000-64000>  Max baud connect speed to display to
  |              Output modifiers
  <cr>

Router# show modem connect-speeds 12000 ?

  <0-3>  Slot number
  |      Output modifiers
  <cr>

Router# show modem connect-speeds 12000 2

  Codes:
  * - Modem has an active call
  R - Modem is being Reset
  D - Download in progress
  B - Modem is marked bad and cannot be used for taking calls
  b - Modem is either busied out or shut-down

  Transmit connect speeds

  Mdm      75    300    600   1200   2400   4800   7200   9600  12000 TotCnt
 Tot        0      0      0    263    254    266      0      0      0    783
 Tot %      0      0      0     33     32     33      0      0      0

  Receive connect speeds

  Mdm      75    300    600   1200   2400   4800   7200   9600  12000 TotCnt
 Tot        0      0      0    263    254    266      0      0      0    783
 Tot %      0      0      0     33     32     33      0      0      0
```

The following example shows connection speed statistics up to 28000 bps:

```
Router# show modem connect-speeds 28800

  transmit connect speeds

  Mdm    9600  12000  14400  16800  19200  21600  24000  26400  28800 TotCnt
* 1/0       0      0      0      0      3      4      6     37     23     74
* 1/1       0      0      3      1      0      4      9     41     20     80
* 1/2       0      0      2      0      1      3     10     37     26     82
  1/3       1      0      0      0      0      3     15     35      7     62
  1/4       0      0      0      0      4      2      8     20     13     49
* 1/5       0      0      4      0      1      0      4     38     17     65
* 1/6       0      0      2      1      0      1      9     32     11     57
* 1/7       1      0      2      0      0      5     10     31     18     67
* 1/8       0      0      0      1      1      1     10     42     11     68
  1/9       0      0      2      1      2      4      4     30     23     67
  1/10      0      0      0      0      0      2      5     26     22     56
* 1/11      0      0      0      0      3      1     16     38     17     76
* 1/12      0      0      0      0      0      3      7     40     12     62
  1/13      0      0      0      1      2      3     11     20     14     51
  1/14      0      0      2      0      0      2      7     26     12     51
  1/15      0      0      1      1      1      2      6     29     25     65
```

```
  1/16      2      0      2      0      1      5     10     37     15     73
  1/17      0      0      0      0      0      2     10     33     22     67
  1/18      0      0      2      2      0      2     12     17     25     61
* 1/19      2      0      3      0      1      2      9     35     20     74
  1/20      0      0      2      2      2      2      8     28     21     65
* 1/21      0      1      2      0      1      2      5     23     21     58
* 1/22      0      0      1      0      1      1      5     27     21     56
* 1/23      0      0      2      0      0      4      8     30     15     60
 Tot        6      1     32     10     24     60    204    752    431   1546
 Tot %      0      0      2      0      1      3     13     48     27

  receive connect speeds

  Mdm    9600  12000  14400  16800  19200  21600  24000  26400  28800 TotCnt
* 1/0       0      0      1      0      1      2      9     35     25     74
* 1/1       0      0      3      0      1      3     10     42     18     80
* 1/2       0      0      2      0      1      4      8     40     26     82
  1/3       1      0      0      0      0      1     10     36     14     62
  1/4       0      0      1      0      2      2      8     22      8     49
* 1/5       0      1      4      0      0      0      9     32     17     65
* 1/6       0      0      2      0      0      0      7     33     14     57
* 1/7       0      0      2      1      1      0      6     39     18     67
* 1/8       0      0      0      0      1      0     11     43     12     68
  1/9       1      0      3      0      0      0      8     33     22     67
  1/10      0      0      0      0      1      1      6     31     17     56
* 1/11      0      0      0      1      1      1     14     43     16     76
* 1/12      0      0      0      0      0      0      5     43     12     62
  1/13      0      0      0      0      0      2     10     26     13     51
  1/14      0      0      2      1      0      0      5     27     14     51
  1/15      0      0      1      0      1      2      3     36     22     65
  1/16      1      0      3      1      2      0      8     37     20     73
  1/17      0      0      0      0      0      0      8     36     22     67
  1/18      0      1      1      0      0      2      4     30     20     61
* 1/19      0      0      3      2      1      1      6     42     18     74
  1/20      0      1      2      1      2      1      2     37     18     65
* 1/21      0      0      3      3      1      2      2     28     18     58
* 1/22      0      0      1      0      1      0      5     32     16     56
* 1/23      0      0      2      0      0      1      8     35     13     60
 Tot        3      3     36     10     17     25    172    838    413   1546
 Tot %      0      0      2      0      1      1     11     54     26
```

The following example shows connection speed statistics up to 56000 bps:

```
Router# show modem connect-speeds 56000

  transmit connect speeds

  Mdm   40000  42000  44000  46000  48000  50000  52000  54000  56000 TotCnt
  1/0       0      0      0      0      0      0      0      0      0      0
  1/1       0      0      0      0      0      0      0      0      0      0
  1/2       0      0      0      0      0      0      0      0      0      0
  1/3       0      0      0      0      0      0      0      0      0      0
  1/4       0      0      0      0      0      0      0      0      0      0
  1/5       0      0      0      0      0      0      0      0      0      0
  1/6       0      0      0      0      0      0      0      0      0      0
  1/7       0      0      0      0      0      0      0      0      0      0
  1/8       0      0      0      0      0      0      0      0      0      0
  1/9       0      0      0      0      0      0      0      0      0      0
  1/10      0      0      0      0      0      0      0      0      0      0
  1/11      0      0      0      0      0      0      0      0      0      0
  1/12      0      0      0      0      0      0      0      0      0      0
  1/13      0      0      0      0      0      0      0      0      0      0
  1/14      0      0      0      0      0      0      0      0      0      0
  1/15      0      0      0      0      0      0      0      0      0      0
```

```
 1/16       0       0       0       0       0       0       0       0       0       0
 1/17       0       0       0       0       0       0       0       0       0       0
 1/18       0       0       0       0       0       0       0       0       0       0
 1/19       0       0       0       0       0       0       0       0       0       0
 1/20       0       0       0       0       0       0       0       0       0       0
 1/21       0       0       0       0       0       0       0       0       0       0
 1/22       0       0       0       0       0       0       0       0       0       0
 1/23       0       0       0       0       0       0       0       0       0       0
Tot         0       0       0       0       0       0       0       0       0       0
Tot %       0       0       0       0       0       0       0       0       0

 receive connect speeds

 Mdm    40000   42000   44000   46000   48000   50000   52000   54000   56000 TotCnt
 1/0        0       0       0       0       0       0       0       0       0       0
 1/1        0       0       0       0       0       0       0       0       0       0
 1/2        0       0       0       0       0       0       0       0       0       0
 1/3        0       0       0       0       0       0       0       0       0       0
 1/4        0       0       0       0       0       0       0       0       0       0
 1/5        0       0       0       0       0       0       0       0       0       0
 1/6        0       0       0       0       0       0       0       0       0       0
 1/7        0       0       0       0       0       0       0       0       0       0
 1/8        0       0       0       0       0       0       0       0       0       0
 1/9        0       0       0       0       0       0       0       0       0       0
 1/10       0       0       0       0       0       0       0       0       0       0
 1/11       0       0       0       0       0       0       0       0       0       0
 1/12       0       0       0       0       0       0       0       0       0       0
 1/13       0       0       0       0       0       0       0       0       0       0
 1/14       0       0       0       0       0       0       0       0       0       0
 1/15       0       0       0       0       0       0       0       0       0       0
 1/16       0       0       0       0       0       0       0       0       0       0
 1/17       0       0       0       0       0       0       0       0       0       0
 1/18       0       0       0       0       0       0       0       0       0       0
 1/19       0       0       0       0       0       0       0       0       0       0
 1/20       0       0       0       0       0       0       0       0       0       0
 1/21       0       0       0       0       0       0       0       0       0       0
 1/22       0       0       0       0       0       0       0       0       0       0
 1/23       0       0       0       0       0       0       0       0       0       0
Tot         0       0       0       0       0       0       0       0       0       0
Tot %       0       0       0       0       0       0       0       0       0       0
```

Table 72 describes the significant fields shown in the displays.

Table 72 show modem connect-speeds Field Descriptions

Field	Description
transmit connect speeds	Connection speeds for calls initiated by the system.
Mdm *slot*/*port*	Specified slot and port number assigned to the modem.
speed counters	The transmit and receive speed counters are 75, 300, 600, 1200, 2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, 33600, 32000, 34000, 36000, 38000, 40000, 42000, 44000, 46000, 48000, 50000, 52000, 54000, and 56000 bps.
TotCnt	For the specified modem, the sum of the number of times a connection was initiated or received at one of the specified connection rates (75 to 56,000 bps).
Tot	For all modems loaded in the system, the total number of times a call was initiated or received at the specified speed.

Table 72 show modem connect-speeds Field Descriptions (continued)

Field	Description
Tot %	Percentage of the total number of calls that were initiated or received at the specified speed.
receive connect speeds	Connection speeds for incoming calls.

Related Commands

Command	Description
clear modem counters	Clears the statistical counters on one or more manageable modems on access servers or routers.

show modem cookie

To display information about the modem cookie, use the **show modem cookie** command in EXEC mode.

show modem cookie

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

The following is sample output from the **show modem cookie** command for a V.34 carrier card and two modem cards:

```
Router# show modem cookie

 Hex dump of modem board HW version info:

 Slot 1:
   Carrier card:
     0000:  1802 0200 0000 0000 0000 0000 0000 0000
     0010:  0000 0000 0000 0000 0000 0000 0000 0000
   Modem Module 0:
     0000:  0C01 3033 3030 3031 4D69 6372 6F63 6F6D
     0010:  204D 4E50 3130 2056 3334 204D 6F64 656D
   Modem Module 1:
     0000:  0C01 3033 3030 3031 4D69 6372 6F63 6F6D
     0010:  204D 4E50 3130 2056 3334 204D 6F64 656D
```

Table 73 describes the significant fields shown in the display.

Table 73 show modem cookie Field Descriptions

Field	Description
Slot 1:	The slot carrying the carrier and modem card.
Carrier card:	Carrier card and its cookie parameters.
Modem Module 0:	Modem card and its cookie parameters.

show modem csm

To display the internal status of the call switching module for modems inside access servers or routers, use the **show modem csm** command in EXEC mode.

show modem csm [*slot*/*port* | **group** *number*]

Syntax Description

slot/*port*	(Optional) Slot and modem port location. If this number is not specified, statistics for all connected modems are displayed. (Include the forward slash (/) when entering this variable.)
group *number*	(Optional) Specific group of modems. If the modem group number is not specified, statistics for all modems in the access server are displayed. The group number range is from 1 to 200.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

The following example displays the call switching module information for modem 1/2 on a Cisco AS5200:

```
Router# show modem csm 1/2

MODEM_INFO: slot 1, port 2, unit 130, modem_mask=0x0004, modem_port_offset=0
tty_hwidb=0x00000000, modem_tty=0x004370A8, mgmt_tty=0x004370A8, modem_pool=0x0041D99C
csm_status(0): CSM_STATUS_UNLOCKED
csm_state(0x00000000)=CSM_OC_STATE, csm_event_proc=0x0005B448
invalid_event_count=0, wdt_timeout_count=0
wdt_timestamp_started is not activated
wait_for_dialing:False, wait_for_bchan:False
pri_chnl=TDM_ISDN_STREAM(s0, c0), modem_chnl=TDM_ISDN_STREAM(s0, c0)
dchan_idb_start_index=0, dchan_idb_index=0, call_id=0x0000, bchan_num=0
csm_event=CSM_EVENT_NONE, cause=0x0000, phone_num=
ring_indicator=0, oh_state=0, oh_int_enable=0, modem_reset=0
ring_no_answer=0, ic_failure=0, ic_complete=0
dial_failure=0, oc_failure=0, oc_complete=0
oc_busy=0, oc_no_dial_tone=0, oc_dial_timeout=0
remote_link_disc=0, busyout=0, modem_reset=0
call_duration_started=00:00:00, call_duration_ended=00:00:00, total_call_duration=00:00:00
The calling party phone number = 4082968388
The called party phone number = 4085267406
```

Table 74 describes the significant fields shown in the display.

Table 74 show modem csm Field Descriptions

Field	Description
MODEM_INFO	Displays internal data structure information.
csm_status	Displays the status of the call switching module. Possible statuses include unlocked, active call, busyout req, shutdown, bad modem, modem hold, back-to-back, file downloading, and reset.
csm_state	Displays the current state of the call switching module. Possible states include idle and connected. Incoming calls are marked IC and outgoing calls are marked OC.
Modem counters	Counters for different modem events.
The calling party phone number The called party phone number	Phone numbers for the dialing integrated modem and the remote modem.

show modem log

To display the modem history event status performed on a manageable modem or group of modems, use the **show modem log** command in EXEC mode.

show modem log [*slot*/*port* | **group** *number*]

Syntax Description

slot/*port*	(Optional) Slot and modem port location. If this number is not specified, statistics for all connected modems are displayed. (Include the forward slash (/) when entering this variable.)
group *number*	(Optional) Specific group of modems. If the modem group number is not specified, statistics for all modems in the access server are displayed. The group number range is from 1 to 200.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.1(5)T	This command was enhanced to display information about the Cisco 3600 series digital modems that support V.110, and about the Cisco 2600 and Cisco 3600 series modems that support leased-line operation.

Examples

The following is sample output from the **show modem log** command issued on a Cisco AS5300, which is loaded with MICA technologies digital modems. See Table 75 for MICA modem field descriptions.

```
Router# show modem log 1/0

Modem 1/0 Events Log:
  01:54:02:Startup event:MICA Hex modem (Select)
   Modem firmware = 2.0.0.9
  01:54:02:RS232 event:
           noRTS, noDTR, CTS, noDCD
  01:54:02:RS232 event:
           RTS, DTR, CTS, noDCD
  01:54:02:RS232 event:
           RTS, DTR, CTS, noDCD
  01:54:02:RS232 event:
           noRTS, DTR, CTS, noDCD
  01:54:02:RS232 event:
           RTS, DTR, CTS, noDCD
  01:54:02:RS232 event:
           noRTS, noDTR, CTS, noDCD
  01:54:02:RS232 event:
           RTS, DTR, CTS, noDCD
  01:54:03:RS232 event:
           RTS, DTR, CTS, noDCD
  00:01:09: ISDN outgoing called number: 1000
  00:01:04:RS232 event:
           noRTS, DTR, CTS, noDCD
```

```
  00:01:04:RS232 event:
           RTS, DTR, CTS, noDCD
  00:01:06:Modem State event:
           State: Open
  00:01:06:Modem State event:
           State: Connect
  00:01:06:Modem State event:
           State: Link
  00:00:54:Modem State event:
           State: Training
  00:00:32:Modem State event:
           State: EC Correction
  00:00:32:Modem State event:
           State: Steady
  00:00:32:RS232 event:
           RTS, DTR, CTS, DCD
  00:00:32:Static event:
    Connect Protocol:  LAP-M
    Compression:  (invalid#3)
    Connected Standard:  Bell212
    TX,RX Symbol Rate:  3429, 3429
    TX,RX Carrier Frequency:  1959, 1959
    TX,RX Trellis Coding:  16, 16
    Frequency Offset:  0 Hz
    Round Trip Delay:  1 msecs
    TX,RX Bit Rate:  16800, 16800
  00:00:33:Dynamic event:
    Sq Value:  7
    Signal Noise Ratio:  35 dB
    Receive Level:  -8 dBm
    Phase Jitter Frequency:  0 Hz
    Phase Jitter Level:  0 degrees
    Far End Echo Level:  -73 dBm
    Phase Roll:  -98 degrees
    Total Retrains:  0
    EC Retransmission Count:  0
    Characters received, transmitted:  0, 32
    Characters received BAD:  0
    PPP/SLIP packets received, transmitted:  0, 0
    PPP/SLIP packets received (BAD/ABORTED):  0
    EC packets transmitted, received:  0, 0
    EC packets (Received BAD/ABORTED):  0
```

The following example shows a portion of the output display when using the **show modem log** command. Because no specific modem or range of modems is designated, the data from all modems is displayed. The V.110 information is highlighted in this example.

```
Router# show modem log

Modem 0/0 Mica: Event Log contains 100 Events:
1d21h MICA-Cfg issued S-Reg configuration change:
    configuration index = 59, value = 0x3
1d21h CSM: Incoming call from 9195555301 to Unknown
1d21h CSM: event-ISDN_CALL New State-IC_MODEM_RESERVED
    CSM: status-1 dchan-3/2 bchan-0
.
.
.
1d21h CSM: event-MODEM_CONNECTED New State-CONNECTED_STATE
1d21h MICA-Qry Static Link Information:
    Connect Protocol - V.110, Compression - None, Connected Standard - V110
    Tx/Rx Symbol Rate - 0/0, Tx/Rx Carrier Freq - 0/0
```

```
    Tx/Rx Trellis Coding - /, Frequency offset - 0Hz
    Round trip delay - 0ms, Tx/Rx bit rate - 2400/2400
    RBS pattern - 0x0, digital pad - , compensation - 0
1d21h MICA-Cmd Set Framing Mode to PPP.
.
.
.
1d21h MICA-Qry Final Link Information:
    Call Time - 00:00:34, Disconnect Reason (0x8001) - SOFTWARE_RESET command
    0 retrains and/or speed shifts, 0 ec retransmissions
    9454 chars tx, 6577 chars rx, 0 chars rx bad
    189 ppp packets tx, 129 ppp packets rx, 14 ppp packets rx bad
    0 ec packets tx, 0 ec packets rx, 0 ec packets rx bad
    0 v110 packets tx, 0 v110 packets rx, 0 v110 packets rx bad, 0 v110 sync loss
1d21h CSM: event-ASYNC_DTR_DOWN New State-IDLE_STATE
1d21h CSM: event-ASYNC_DTR_DOWN New State-IDLE_STATE
.
.
.
1d21h MICA-Cfg issued S-Reg configuration change:
    S29 = 8       V.110 modem standard
1d21h MICA-Cfg issued S-Reg configuration change:
    S57 = 3       User rate for V.110 connection is 3 bps
.
.
.
```

Table 75 describes the significant fields shown in the MICA modem display.

Table 75 show modem log Field Descriptions for MICA Modems

Field	Event State	Description
Modem <slot/port> Events Log:		The modem for which log events are currently displayed.
00:00:00:		Identifies the time elapsed (in hours: minutes: seconds) since each MICA modem event was performed (for example, 01:02:41 means the modem event occurred 1 hour, 2 minutes, and 41 seconds ago).
Startup event:		Type of specified MICA modem.
Modem firmware:		Modem firmware version.
RS232 event:		Detected modem signaling event.
ISDN outgoing called number:		Outgoing ISDN phone number dialed by the specified MICA modem.

Table 75 show modem log Field Descriptions for MICA Modems (continued)

Field	Event State	Description
Modem State event	Current state of the MICA modem, which can be any of the following:	
	Connect	Modem is connected to a remote host.
	Open	Open modem event.
	Link	Link protocol event occurred.
	Training	Modem retraining event.
	EC Correction	Error correction frames transmitted or received.
	Steady	Steady modem event.
	Bad	Inoperable state, which is configured by the **modem bad** command.
	Bad*	Inoperable state, which is configured by the **modem startup-test** command during initial power-up testing.
	Reset	Modem is in reset mode.
	D/L	Modem is downloading firmware.
	Bad FW	Downloaded modem firmware is not operational.
	Busy	Modem is out of service and not available for calls.
	Idle	Modem is ready for incoming and outgoing calls.
Static event:	Current static event of the MICA modem, which can be any of the following:	
	Connect Protocol	Connection protocol used for the current session, which can be SYNC mode, ASYNC mode, ARA1.0, ARA2.0, Link Access Procedure for Modems (LAP-M), or Microcom Network Protocol (MNP).
	Compression	Type of compression used for the current session, which can be None, V.42*bis* TX, V.42*bis* RX, V.42*bis* both, or MNP5 data compression.
	Connected Standard	Standards protocol used to connect, which can be V.21, Bell103, V.22, V.22bis, Bell212, V.23, V.32, V.32bis, V.32terbo, V.34, V.34+, or K56Flex 1.1.
	TX, RX Symbol Rate	Symbol rate used to send samples to the line or receive samples off of the line.
	TX, RX Carrier Frequency	Carrier frequency used by the remote service provider.
	TX, RX Trellis Coding	Trellis coding received and transmitted.
	Frequency Offset	+/–32 in 1/8 Hz steps.
	Round Trip Delay	Total round trip propagation delay of the link, which is expressed in milliseconds.
	TX, RX Bit Rate	For RX, the bit rate from the remote service provider to the local service provider. For TX, the bit rate from the local service provider to the remote service provider.

Table 75 show modem log Field Descriptions for MICA Modems (continued)

Field	Event State	Description
Dynamic event:	Current dynamic event of the MICA modem, which can be any of the following:	
	Sq Value	Signal quality value, which can be from 0 to 7 (0 is the worst possible quality).
	Signal Noise Ratio	Expressed in decibels (dB), which can be from 0 to 70 dB steps.
	Receive Level	Expressed in decibels, which can be from 0 to –128 dBm steps.
	Phase Jitter Frequency	+/–32 in 1/8 Hz steps.
	Phase Jitter Level	0 to 90 degrees.
	Far End Echo Level	0 to –90 in dBm of far end echo level (that portion of the transmitted analog signal that has bounced off the remote modem's analog front end).
	Phase Roll	+/–32 in 1/8 Hz steps.
	Total Retrains	Count of total retrains.
	EC Retransmission Count	Count of total error correction retransmissions that occurred during the duration of the link.
	Characters received, transmitted	Count of total characters received and transmitted.
	Characters received BAD	A subset of the total Characters received, transmitted. Represents the total number of parity error characters.
	PPP/SLIP packets received, transmitted	Total count of PPP/SLIP packets transmitted and received. This total could include all PPP/SLIP packets, including BAD/ABORTED packets.
	PPP/SLIP packets received, (BAD/ABORTED)	Total count of the bad or aborted PPP/SLIP packets, which is a subset of the PPP/SLIP packets received, transmitted.
	EC packets transmitted, received	Count of total error correction frames transmitted or received. This total could include all error correction packets, including BAD/ABORTED packets.
	EC packets (Received BAD/ABORTED)	Total count of the bad or aborted error correction packets, which is a subset of the EC packets transmitted, received.

The following example displays the event log status for a V.34 Microcom manageable modem installed in a Cisco AS5200. To escape from the log display mode, press the keys Ctrl-c. See Table 77 for Microcom field descriptions.

```
Router# show modem log 1/0

Modem 1/0 Events Log:
  04:58:33: End connection event: Retransmits for EC block (TX/RX) = 86/33
            Duration = 0:10:21, Number of TX/RX char = 100183/34307
            Local Disc Reason = Remote Link Disc
            Remote Disc Reason = Unknown
  04:58:33: Modem State event: Idle
  04:58:33: DTR event: DTR Off
             04:58:33: RS232 event: RTS  noDTR* CTS* DSR* noDCD* noRI* noTST*
```

```
04:58:21: DTR event: DTR On
           04:58:21: RS232 event: RTS* DTR* CTS  DSR  noDCD  noRI  noTST
04:56:27: ISDN incoming calling number: 7039687666
04:56:27: ISDN incoming called number: 8366
04:56:21: Modem State event: Dialing/Answering
04:56:21: Modem State event: Incoming ring
04:56:21: Modem State event: Waiting for Carrier
           04:56:21: RS232 event: RTS  DTR  CTS  DSR  noDCD  noRI* noTST
04:56:09: Modem State event: Connected
04:56:09: Connection event: TX/RX Speed = 24000/26400, Modulation = V34
          Direction = Answer, Protocol = reliable/LAPM, Compression = V42bis
           04:56:09: RS232 event: RTS  DTR  CTS  DSR  DCD* noRI  noTST
04:55:57: Modem Analog signal event: TX = -13, RX = -17, Signal to noise = 40
04:55:21: Modem State event: Disconnecting
04:55:21: End connection event: Retransmits for EC block (TX/RX) = 0/0
          Duration = 0:00:46, Number of TX/RX char = 8911/7732
          Local Disc Reason = Remote Link Disc
          Remote Disc Reason = Unknown
04:55:23: Modem State event: Idle
04:55:23: DTR event: DTR Off
           04:55:23: RS232 event: RTS  noDTR* CTS* DSR* noDCD* noRI* noTST*
04:55:11: DTR event: DTR On
           04:55:11: RS232 event: RTS  DTR* CTS  DSR  noDCD  noRI  noTST
04:53:23: ISDN incoming calling number: 8477262725
04:53:23: ISDN incoming called number: 8366
04:53:22: Modem State event: Dialing/Answering
04:53:22: Modem State event: Incoming ring
           04:53:22: RS232 event: RTS  DTR  CTS  DSR  noDCD  noRI* noTST
04:53:10: Modem State event: Waiting for Carrier
           04:53:10: RS232 event: RTS  DTR  CTS  DSR  noDCD  noRI* noTST
04:52:58: Modem State event: Connected
04:52:58: Connection event: TX/RX Speed = 24000/24000, Modulation = V34
          Direction = Answer, Protocol = reliable/LAPM, Compression = V42bis
04:52:58: Modem Analog signal event: TX = -13, RX = -19, Signal to noise = 40
           04:52:58: RS232 event: RTS  DTR  CTS  DSR  DCD* noRI  noTST
04:52:46: Modem State event: Retrain Initiated
04:52:34: Connection update event: TX/RX Speed = 24000/24000, Modulation = V34
04:52:34: Modem State event: Connected
04:52:22: Modem Analog signal event: TX = -13, RX = -17, Signal to noise = 40
           04:52:12: RS232 event: RTS  DTR  CTS* DSR  DCD  noRI  noTST
           04:49:24: RS232 event: RTS  DTR  CTS* DSR  DCD  noRI  noTST
           04:49:12: RS232 event: RTS  DTR  CTS* DSR  DCD  noRI  noTST
           04:19:14: RS232 event: RTS  DTR  CTS* DSR  DCD  noRI  noTST
03:46:29: Modem State event: Disconnecting
03:46:29: End connection event: Retransmits for EC block (TX/RX) = 6/8
          Duration = 1:06:31, Number of TX/RX char = 114943/29854
          Local Disc Reason = Remote Link Disc
          Remote Disc Reason = Unknown
03:46:29: Modem State event: Idle
03:46:29: DTR event: DTR Off
03:46:29: DTR event: DTR On
           03:46:29: RS232 event: RTS  DTR* CTS* DSR* noDCD* noRI* noTST*
03:45:35: ISDN incoming calling number: 5124745911
03:45:35: ISDN incoming called number: 8366
03:45:29: Modem State event: Dialing/Answering
03:45:29: Modem State event: Incoming ring
03:45:29: Modem State event: Waiting for Carrier
```

Table 76 describes the significant fields shown in the Microcom modem display.

Table 76 show modem log Field Descriptions for Microcom Modems

Field	Description
Modem <slot/port> Events Log:	The modem for which log events are currently displayed.
00:00:00:	Identifies the time elapsed (in hours: minutes: seconds) since each Microcom modem event was performed (for example, 01:02:41 means the modem event occurred 1 hour, 2 minutes, and 41 seconds ago).
Startup Response:	List of information describing the modem type, modem firmware, and Digital Signal Processor (DSP) controller version (for 56K modems only).
Control Reply	Indicates the events the modem will be monitoring.
RS232 event	Detected modem signaling.
Modem State event	Current state of the modem, which can be any of the following: • Conn—Modem is connected to a remote host. • Bad—Inoperable state, which is configured by the **modem bad** command. • Bad*—Inoperable state, which is configured by the **modem startup-test** command during initial power-up testing. • Reset—Modem is in reset mode. • D/L—Modem is downloading firmware. • Bad FW—Downloaded modem firmware is not operational. • Busy—Modem is out of service and not available for calls. • Idle—Modem is ready for incoming and outgoing calls.

Table 76 show modem log Field Descriptions for Microcom Modems (continued)

Field	Description
End connection event	Descriptions or reasons why a connection was terminated: • Duration—Time (in hours: minutes: seconds) a connection was up between the local and remote devices. • Number of TX/RX char—Transmit and receive characters exchanged during the connection time. • Local or Remote Disc Reason—Reason why the local or remote modem disconnected: – Lost Carrier—The modem firmware detects a drop in Carrier Detect during a connection. – DSP Task Hung—The DSP chip malfunctioned and failed to reset. – Link Access Procedure for Modems (LAPM) Timeout—Timed out waiting for a reply from remote. – Reliable link transmit timeout—Have not received a link acknowledgment in the first 30 seconds of the connection. – DSP access failure—Timed out trying to access the DSP chip. – CD off timeout—Timed out waiting for carrier to return after a retrain/rate renegotiation. – Code word size mismatched—The code word sizes are mismatched. – DSP code download Error—Error during the DSP code download. The time taken to recover and repeat the download would take too long to complete the handshake.
Phone number event	Descriptive information about the last dialed or current phone number.

The following example displays the event log status for a manageable modem. It also identifies the time elapsed since each modem event was performed (for example, 01:02:41 means the modem event occurred 1 hour, 2 minutes, and 41 seconds ago). To escape from the log display mode, press the keys Ctrl-c.

```
Router# show modem log 0/0

Modem 0/0 Events Log:
  01:03:03: Startup Response: Microcom MNP10 K56 Modem (Select)
            Modem (boot) firmware = 3.1(16) (3.0(4))
            DSP Controller (SPX) rev = 204.173(0) (143.191(0))
  01:03:03: Control Reply: 0xFF1F
  01:03:03: RS232 event: RTS  noDTR* CTS* DSR* noDCD* noRI  noTST
  01:03:03: RS232 event: RTS  noDTR  CTS  DSR  noDCD  noRI  noTST
  01:03:03: Modem State event: Idle
  01:03:03: End connection event: Retransmits for MNP block (TX/RX) = 0/0
            Duration = 0:00:00, Number of TX/RX char = 0/0
            Local Disc Reason = Lost Carrier
            Remote Disc Reason = Unknown
```

```
01:03:04: Phone number event:
01:02:51: DTR event: DTR On
01:02:51: RS232 event: RTS  DTR* CTS  DSR  noDCD  noRI  noTST
00:39:52: Startup Response: Microcom MNP10 K56 Modem (Select)
          Modem (boot) firmware = 3.1(16) (3.0(4))
          DSP Controller (SPX) rev = 1.1(0) (1.1(0))
00:39:52: Control Reply: 0xFF1F
00:39:52: RS232 event: RTS  noDTR* CTS* DSR* noDCD* noRI  noTST
00:39:52: RS232 event: RTS  noDTR  CTS  DSR  noDCD  noRI  noTST
00:39:53: Modem State event: Idle
00:39:53: End connection event: Retransmits for MNP block (TX/RX) = 0/0
          Duration = 0:00:00, Number of TX/RX char = 0/0
          Local Disc Reason = Lost Carrier
          Remote Disc Reason = Unknown
00:39:53: Phone number event:
00:39:32: DTR event: DTR On
00:39:32: RS232 event: RTS  DTR* CTS  DSR  noDCD  noRI  noTST
```

Table 77 describes the significant fields shown in the display.

Table 77 show modem log Field Descriptions

Field	Description
Modem <slot/port> Events Log:	The modem for which log events are currently displayed.
Startup Response:	List of information describing the modem type, modem firmware, and DSP controller version (for 56K modems only).
Control Reply	Indicates the events the modem will be monitoring.
RS232 event	Detected modem signaling.
Modem State event	Current state of the modem, which can be any of the following: • Conn—Modem is connected to a remote host. • Bad—Inoperable state, which is configured by the **modem bad** command. • Bad*—Inoperable state, which is configured by the **modem startup-test** command during initial power-up testing. • Reset—Modem is in reset mode. • D/L—Modem is downloading firmware. • Bad FW—Downloaded modem firmware is not operational. • Busy—Modem is out of service and not available for calls. • Idle—Modem is ready for incoming and outgoing calls.

Table 77 show modem log Field Descriptions (continued)

Field	Description
End connection event	Descriptions or reasons why a connection was terminated: • Duration—Time a connection (in hours: minutes: seconds) was up between the local and remote devices. • Number of TX/RX char—Transmit and receive characters exchanged during the connection time. • Local or Remote Disc Reason—Reason the local or remote modem disconnected: – Lost Carrier—The modem firmware detects a drop in Carrier Detect during a connection. – DSP Task Hung—The DSP chip malfunctioned and failed to reset.
Phone number event	Descriptive information about the last dialed or current phone number.

The **show modem log** command shows the progress of leased line connections. The following example is taken from a Cisco 2600 series router configured for a leased line. Note the "LL Answering" state and "LL Answer" in the "Direction" field of the connection report:

```
Router# show modem log

  00:44:03.884 DTR set high
  00:44:02.888 Modem enabled
  00:43:57.732 Modem disabled
  00:43:52.476 Modem State: LL Answering
  00:43:52.476 CSM: event-MODEM_STARTING_CONNECT New State-CSM_CONNECT_INITIATED_STATE
  00:43:51.112 Modem State: Waiting for Carrier
  00:43:43.308 Modem State: Connected
  00:43:42.304 Connection: TX/RX Speed = 33600/33600, Modulation = V34
  Direction = LL Answer, Protocol = MNP, Compression = V42bis
  00:43:42.304 CSM: event-MODEM_CONNECTED New State-CONNECTED_STATE
  00:43:42.300 RS232: noCTS* DSR* DCD* noRI noRxBREAK TxBREAK*
  00:43:41.892 PPP mode active
  00:43:41.892 Modem enabled
  00:43:39.888 PPP escape maps set: TX map=00000000 RX map=FFFFFFFF
  00:43:39.724 PPP escape maps set: TX map=00000000 RX map=000A0000
  00:43:34.444 RS232: CTS* DSR DCD noRI noRxBREAK TxBREAK
  00:43:11.716 Modem Analog Report: TX = -20, RX = -34, Signal to noise = 61
```

Table 78 describes the significant fields shown in the display.

Table 78 show modem log Field Descriptions

Field	Description
Modem <slot/port> Events Log:	The modem for which log events are currently displayed.
Startup Response:	List of information describing the modem type, modem firmware, and DSP controller version (for 56K modems only).
Control Reply	Indicates the events the modem will be monitoring.
RS232 event	Detected modem signaling.

Table 78 show modem log Field Descriptions (continued)

Field	Description
Modem State event	Current state of the modem, which can be any of the following: • Conn—Modem is connected to a remote host. • Bad—Inoperable state, which is configured by the modem bad command. • Bad*—Inoperable state, which is configured by the modem startup-test command during initial power-up testing. • Reset—Modem is in reset mode. • D/L—Modem is downloading firmware. • Bad FW—Downloaded modem firmware is not operational. • Busy—Modem is out of service and not available for calls. • Idle—Modem is ready for incoming and outgoing calls.
End connection event	Descriptions or reasons why a connection was terminated: • Duration—Time a connection was up between the local and remote devices. • Number of TX/RX char—Transmit and receive characters exchanged during the connection time. • Local or Remote Disc Reason—Reason the local or remote modem disconnected: – Lost Carrier—The modem firmware detects a drop in Carrier Detect during a connection. – DSP Task Hung—The DSP chip malfunctioned and failed to reset. – Phone number event—Descriptive information about the last dialed or current phone number.

Related Commands

Command	Description
show modem configuration	Displays the current modem configuration for digital MICA technologies modems loaded inside access servers or routers.
show modem mica	Displays information about MICA technologies digital modems.
show modem operational-status	Displays the current modem operational status for MICA digital modems loaded in access servers or routers.
show modemcap	Displays the values set for the current modem and lists the modems for which the router has entries.

show modem mapping

To display a snapshot of all the firmware versions running on all the modems in the access server, use the **show modem mapping** command in EXEC mode.

show modem mapping

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.3 T	This command was introduced.

Usage Guidelines

This command is useful for managing and monitoring multiple versions of modem firmware running in an access server. This command also shows the source location of each version of firmware (for example, running out of Flash or boot Flash memory, or bundled with Cisco IOS software).

Firmware can also be copied from a local TFTP server to the onboard modems. For the Cisco AS5300, issue the **copy tftp flash** command followed by the **copy flash modem** command. The Cisco AS5300 stores individual firmware files that are not bundled with the Cisco IOS software in Flash memory. For the Cisco AS5200, issue the **copy tftp bootflash** command followed by the **copy bootflash modem** command. The Cisco AS5200 stores individual firmware files not bundled with the Cisco IOS software in boot Flash memory.

All the modems in a single MICA technologies modem module run the same version of firmware (for example, modems 1/0 through 1/5 in module 0). However, different versions of modem firmware can exist between different modem modules (for example, module 0 and module 1).

Individual firmware files cannot be erased from Flash or boot Flash memory. The entire contents of Flash or boot Flash memory must be deleted during the erase operation. If you do this delete, be sure to back up your Cisco IOS software and running configuration *before* you erase your system's Flash or boot Flash memory.

Note The Cisco AS5800 does not support the **show modem mapping** command. Use the **show modem bundled-firmware** command instead.

Examples

The following is sample output from the **show modem mapping** EXEC command. This access server is loaded with MICA and Microcom modems.

```
Router# show modem mapping

Slot 1 has Mica Carrier card.


        Modem      Firmware   Firmware
Module  Numbers    Rev        Filename
  0   1/0  - 1/5   2.0.1.7    IOS-Defaults
  1   1/6  - 1/11  2.0.1.7    IOS-Defaults
  2   1/12 - 1/17  2.0.1.7    IOS-Defaults
  3   1/18 - 1/23  2.0.1.7    IOS-Defaults
  4   1/24 - 1/29  2.0.1.7    IOS-Defaults
  5   1/30 - 1/35  2.0.1.7    IOS-Defaults
  6   1/36 - 1/41  2.0.1.7    IOS-Defaults
  7   1/42 - 1/47  2.2.3.0    flash:mica-modem-portware.2.2.3.0.bin

Slot 2 has Microcom Carrier card.

      Module  Firmware     Firmware
Mdm   Number  Rev          Filename
2/0      0    3.2(10)      flash:mcom-modem-code-3.2.10.bin
2/1      0    3.1(30)      IOS-Defaults
2/2      0    3.1(30)      IOS-Defaults
2/3      0    3.1(30)      IOS-Defaults
2/4      0    3.1(30)      IOS-Defaults
2/5      0    3.1(30)      IOS-Defaults
2/6      0    3.1(30)      IOS-Defaults
2/7      0    3.1(30)      IOS-Defaults
2/8      0    3.1(30)      IOS-Defaults
2/9      0    3.1(30)      IOS-Defaults
2/10     0    3.1(30)      IOS-Defaults
2/11     0    3.1(30)      IOS-Defaults
2/12     1    3.1(30)      IOS-Defaults
2/13     1    3.1(30)      IOS-Defaults
2/14     1    3.1(30)      IOS-Defaults
2/15     1    3.1(30)      IOS-Defaults
2/16     1    3.1(30)      IOS-Defaults
2/17     1    3.1(30)      IOS-Defaults
2/18     1    3.1(30)      IOS-Defaults
2/19     1    3.1(30)      IOS-Defaults
2/20     1    3.1(30)      IOS-Defaults
2/21     1    3.1(30)      IOS-Defaults
2/22     1    3.1(30)      IOS-Defaults
2/23     1    3.1(30)      IOS-Defaults

IOS Bundled Firmware Information:

Mica Boardware Version : 1.3.4.5
Mica Portware Version : 2.0.1.7
Microcom Firmware Version : 3.1.30
Microcom DSP Software Version : 1.01

 Firmware files on Boot Flash:

Firmware-file                                    Version  Firmware-Type
=============                                    =======  =============

Firmware files on System Flash:

Firmware-file                                    Version  Firmware-Type
```

```
=============                                    =======  =============
flash:mcom-modem-code-3.2.10.bin                 3.2.10   Microcom F/W and DSP
flash:mica-modem-portware.2.2.3.0.bin            2.2.3.0  Mica Portware
```

Table 79 describes the significant fields shown in the display.

Table 79 show modem mapping Field Descriptions

Field	Description
Slot *x* has card	Type of modem card inserted in the specified slot.
Module	Modem module number that corresponds with the specified modem or group of modems.
Modem numbers	Range of specified modems, which are displayed as slot/port.
Mdm	Specified modem number, which is displayed as slot/port.
Firmware Rev	Version of firmware running on the modem or module. Each time the access server reloads, this version of firmware is copied to the specified modem or range of modems. The field “Unknown” is displayed when a modem is upgrading its firmware.
Firmware Filename	Location or filename of the firmware that is downloaded to the modems. A firmware file located in Flash memory begins as flash:filename. A file located in boot Flash memory begins as bootflash:filename. If the firmware is embedded or bundled in the Cisco IOS image, the field IOS-Defaults appears. On the Cisco AS5300, firmware files are stored in the system Flash memory. On the Cisco AS5200, firmware files are stored in boot Flash memory.
IOS Bundled Firmware Information:	List of firmware versions that are bundled with the Cisco IOS software running on the system. If the firmware versions in this section are more current than the firmware running on your modems, you should upgrade the running modem firmware.
Firmware files on Boot Flash:	List of current firmware located on boot Flash memory. The categories are Firmware-file, Version, and Firmware-Type.
Firmware files on System Flash:	List of current firmware located on the system Flash memory. The categories are Firmware-file, Version, and Firmware-Type.

Related Commands

Command	Description
copy	Copies any file from a source to a destination, including a source or destination URL for a TFTP network server, or for Flash memory.
copy modem	Copies modem firmware to integrated modems in an access server.
show modem bundled-firmware	Displays a list of bundled modem firmware images by slot (Cisco AS5800 access server only).

show modem mica

To display information about MICA technologies digital modems, use the **show modem mica** command in EXEC mode.

show modem mica {*slot*/*port* | **all** | **slot** [*slot-number*]}

Syntax Description

slot/*port*	Single modem in a MICA digital modem board. The slash mark is required.
all	All the MICA modems in the system.
slot *slot-number*	A particular slot, which is mainly used for debugging purposes. The optional *slot-number* argument allows you to specify a slot number.

Command Modes

EXEC

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

Each MICA modem has its own data channel port, which is tied to its own TTY line. For example, modem 0/1 is tied to TTY line 2. To display data channel information for a single MICA modem, issue the **show modem mica** *slot*/*port* command.

All the modems on each MICA modem card share three pseudochannels for modem management functions, for example, the DC session channel, status polling channel, and controlling channel. To display statistics for each modem management channel, issue the **show modem mica all** command. The first channel you see displayed is the status polling channel (shown as SLOT/PORT (0/61) TTYNUM=-1 (MM Status Port)). The second displayed channel is the DC session channel (shown as SLOT/PORT (0/60) TTYNUM=-1 (MM DC Port)). The third displayed port is the controlling channel (shown as SLOT/PORT (0/62) TTYNUM=-1 (Control Port)). No TTY lines are associated with the modem management ports, as indicated by the field display TTYNUM=-1. An extensive list of all the data channels for each MICA modem is also displayed.

Examples

The following example displays the data port channel for modem 0/1. For a description of the significant fields shown in this display, see Table 80.

```
Router# show modem mica 0/1

SLOT/PORT (0/1) TTYNUM=2 (Data Port)
Modem hardware state: CTS noDSR  DTR RTS
RX Queue count is 0
TX Queue count is 1
TTY outpak is 0
TX pending FALSE
RX pending FALSE
RX ring with 4 entries at 0x40093184, (RX_AVAILABLE) rx_count=4
Rx_pak_head=0x6082B030 Rx_BD_head=0x4009318C Rx_BD_base=0x40093184
INPUT count = 12
```

```
00 pak=0x60753064 buf=0x40067514 status=8000 pak_size=0
01 pak=0x6082B030 buf=0x4013F948 status=8000 pak_size=0
02 pak=0x60A4323C buf=0x4021A214 status=8000 pak_size=0
03 pak=0x60A32DA0 buf=0x40208E9C status=8800 pak_size=0

TX ring with 4 entries at 0x400943F0, (TX_READY) tx_count = 0
tx_head = 0x400943F0 , head_txp = 0x0
Tx_bd_tail=0x400943F0 , Tx_bd_base=0x400943F0
OUTPUT count = 12
00 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
01 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
02 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
03 pak=0x0000000 buf=0x0000000 status=0800 pak_size=0
```

The following is sample output from the **show modem mica all** command. For a description of the significant fields shown in this display, see Table 80.

```
Router# show modem mica all

SLOT/PORT (0/60) TTYNUM=-1 (MM DC Port)
Modem hardware state: CTS DSR  DTR RTS
Board is running boardware version 1.3.2.0
Boardware redirect state = DISABLE  size=4520 location=0x400968A8
Board INTR ON
RX[0]=0x0 RX[1]=0x0 RX[2]=0x0 RX[3]=0x0
TX[0]=0x0 TX[1]=0x0 TX[2]=0x0 TX[3]=0x0
Next Modem service is 0
Throttle count is 0, Throttle state is OFF
Data channel no buffer count is 0
Boardware crash count is 0
No crash dump available
Board state is RUNNING
Modules state are: R R R R R R R R
Modules crash count are: 0 0 0 0 0 0 0 0
Interval timer is 16

RX Queue count is 0
TX Queue count is 0
TTY outpak is 0
TX pending FALSE
RX pending FALSE
RX ring with 4 entries at 0x400938E4, (RX_AVAILABLE) rx_count=4
Rx_pak_head=0x60761CE0 Rx_BD_head=0x400938F4 Rx_BD_base=0x400938E4
INPUT count = 2
00 pak=0x60761920 buf=0x4009025C status=8000 pak_size=0
01 pak=0x60761740 buf=0x4008FBA4 status=8000 pak_size=0
02 pak=0x60761CE0 buf=0x40090FCC status=8000 pak_size=0
03 pak=0x6084311C buf=0x40150608 status=8800 pak_size=0

TX ring with 4 entries at 0x40094B50, (TX_READY) tx_count = 0
tx_head = 0x40094B60 , head_txp = 0x0
Tx_bd_tail=0x40094B60 , Tx_bd_base=0x40094B50
OUTPUT count = 2
00 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
01 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
02 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
03 pak=0x0000000 buf=0x0000000 status=0800 pak_size=0

SLOT/PORT (0/61) TTYNUM=-1 (MM Status Port)
Modem hardware state: CTS DSR  DTR RTS
Board is running boardware version 1.3.2.0
Boardware redirect state = DISABLE  size=4520 location=0x400968A8
Board INTR ON
RX[0]=0x0 RX[1]=0x0 RX[2]=0x0 RX[3]=0x0
```

```
TX[0]=0x0 TX[1]=0x0 TX[2]=0x0 TX[3]=0x0
Next Modem service is 0
Throttle count is 0, Throttle state is OFF
Data channel no buffer count is 0
Boardware crash count is 0
No crash dump available
Board state is RUNNING
Modules state are: R R R R R R R R
Modules crash count are: 0 0 0 0 0 0 0 0
Interval timer is 16
```

The following is sample output from the **show modem mica slot** command. For a description of the significant fields shown in this display, see Table 80.

```
Router# show modem mica slot

SLOT/PORT (0/62) TTYNUM=-1 (Control Port)
Modem hardware state: CTS DSR  DTR RTS
Board is running boardware version 1.3.2.0
Boardware redirect state = DISABLE  size=4520 location=0x400968A8
Board INTR ON
RX[0]=0x0 RX[1]=0x0 RX[2]=0x0 RX[3]=0x0
TX[0]=0x0 TX[1]=0x0 TX[2]=0x0 TX[3]=0x0
Next Modem service is 0
Throttle count is 0, Throttle state is OFF
Data channel no buffer count is 0
Boardware crash count is 0
No crash dump available
Board state is RUNNING
Modules state are: R R R R R R R R
Modules crash count are: 0 0 0 0 0 0 0 0
Interval timer is 16

RX Queue count is 0
TX Queue count is 0
TTY outpak is 0
TX pending FALSE
RX pending FALSE
RX ring with 4 entries at 0x40093924, (RX_AVAILABLE) rx_count=4
Rx_pak_head=0x6075D4D8 Rx_BD_head=0x40093934 Rx_BD_base=0x40093924
INPUT count = 1366
00 pak=0x6075CD58 buf=0x4008A2BC status=8000 pak_size=0
01 pak=0x6075D6B8 buf=0x4008C454 status=8000 pak_size=0
02 pak=0x6075D4D8 buf=0x4008BD9C status=8000 pak_size=0
03 pak=0x6075D2F8 buf=0x4008B6E4 status=8800 pak_size=0

TX ring with 4 entries at 0x40094B90, (TX_READY) tx_count = 0
tx_head = 0x40094BA0 , head_txp = 0x0
Tx_bd_tail=0x40094BA0 , Tx_bd_base=0x40094B90
OUTPUT count = 1894
00 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
01 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
02 pak=0x0000000 buf=0x0000000 status=0000 pak_size=0
03 pak=0x0000000 buf=0x0000000 status=0800 pak_size=0
```

The first channel you see displayed is the status polling channel (shown as SLOT/PORT (0/62) TTYNUM=-1 (MM Status Port)). The second displayed channel is the DC session channel (shown as SLOT/PORT (0/60) TTYNUM=-1 (MM DC Port)). The third displayed port is the controlling channel (shown as SLOT/PORT (0/62) TTYNUM=-1 (Control Port)). No TTY lines are associated with the modem management ports, as indicated by the field display TTYNUM=-1. An extensive list of all the data channels for each individual MICA modem is displayed. Table 80 describes the significant fields shown in the displays.

Table 80 show modem mica Field Descriptions

Field	Description
SLOT/PORT (0/61) TTYNUM=-1 (MM Status Port)	Status polling channel.
SLOT/PORT (0/60) TTYNUM=-1 (MM DC Port)	DC session channel.
SLOT/PORT (0/62) TTYNUM=-1 (Control Port)	Controlling pseudochannel.
Modem hardware state:	State of the modem hardware, which can be CTS, DSR, DTR, and RTS.
Board is running boardware version	Version of boardware.
Boardware crash count	Number of times the board has crashed since the system was last power cycled.
Modules state are:	State of the modem modules. R means that the specified modem module is running.
Modules crash count are:	Number of times each modem module has crashed since the system was last power cycled.
INPUT count =	Count of packets received since the last power cycle.
OUTPUT count =	Count of packets transmitted since the last power cycle.

Related Commands

Command	Description
show modem configuration	Displays the current modem configuration for digital MICA technologies modems loaded inside access servers or routers.
show modem log	Displays the modem history event status performed on a manageable modem or group of modems.
show modem operational-status	Displays the current modem operational status for MICA technologies digital modems loaded in access servers or routers.

show modem operational-status

To display performance statistics for individual modems, use the **show modem operational-status** command in EXEC mode.

show modem operational-status [*slot/port*]

Syntax Description

slot/port	(Optional) Location of the slot and modem port. If these numbers are not specified, statistics for all connected modems are displayed. Include the slash mark when entering these arguments.

Command Modes

EXEC

Command History

Release	Modification
11.2(10)P	This command was introduced.
12.1(5)T	This command was enhanced to display information about modems on the Cisco 3600 series.

Usage Guidelines

The **show modem operational-status** command is supported on Cisco AS2600, Cisco AS3600, and Cisco AS5300 series access servers with internal MICA technologies or Microcom analog (NM-AM) modems, but not in servers with internal Microcom digital modems.

To display performance statistics for Cisco AS3600 access servers with other modem types, use the following command sequence:

```
Router# modem at-mode s/p
AT@E1
```

Sample output and explanations of the **AT@E1** modem command are provided in the document *AT Command Set and Register Summary for Analog Modem Network Modules*, found in the Analog Modem Firmware index of the Cisco 3600 Series Router documentation on Cisco.com.

To display the operational status of a specific modem port or port range for the Cisco AS5400 and AS5800 access servers, use the **show port operational-status** command.

Examples

The following example shows performance statistics for modem 0/0 on a Cisco 3600 series router network module:

```
Router# show modem operational-status 0/0

Modem (0/0) Operational Status:
 Parameter #0  Disconnect Reason Info:  (0x0)
       Type (=0 ):  <unknown>
      Class (=0 ):  Other
     Reason (=0 ):  no disconnect has yet occurred
 Parameter #1  Connect Protocol:  ISDN Mode
 Parameter #2  Compression:  None
 Parameter #3  EC Retransmission Count:  0
 Parameter #4  Self Test Error Count:  0
```

```
 Parameter #5  Call Timer:  179077 secs
 Parameter #6  Total Retrains:  0
 Parameter #7  Sq Value:  7
 Parameter #8  Connected Standard:  ISDN
 Parameter #9  TX,RX Bit Rate:  2400, 2400
 Parameter #11 TX,RX Symbol Rate:  0, 0
 Parameter #13 TX,RX Carrier Frequency:  0, 0
 Parameter #15 TX,RX Trellis Coding:  (n/a), (n/a)
 Parameter #16 TX,RX Preemphasis Index:  0, 0
 Parameter #17 TX,RX Constellation Shaping:  (n/a), (n/a)
 Parameter #18 TX,RX Nonlinear Encoding:  (n/a), (n/a)
 Parameter #19 TX,RX Precoding:  (n/a), (n/a)
 Parameter #20 TX,RX Xmit Level Reduction:  0, 0 dBm
 Parameter #21 Signal Noise Ratio:  0 dB
 Parameter #22 Receive Level:  0 dBm
 Parameter #23 Frequency Offset:  0 Hz
 Parameter #24 Phase Jitter Frequency:  0 Hz
 Parameter #25 Phase Jitter Level:  0 degrees
 Parameter #26 Far End Echo Level:  0 dBm
 Parameter #27 Phase Roll:  0 degrees
 Parameter #28 Round Trip Delay:  0 msecs
 Parameter #30 Characters transmitted, received:  39483250, 41069212
 Parameter #32 General Portware Information:  0
 Parameter #33 PPP/SLIP packets transmitted, received:  774185, 774894
 Parameter #35 PPP/SLIP packets received (BAD/ABORTED):  0
 Parameter #36 EC packets transmitted, received OK:  0, 0
 Parameter #38 EC packets (Received BAD/ABORTED):  0
 Parameter #39 Robbed Bit Signalling (RBS) pattern:  0
 Parameter #40 Digital Pad:  (n/a),  Digital Pad Compensation: None
 Parameter #41 V110/PIAFS frames received bad:  0
 Parameter #42 V110/PIAFS frames received good:  0
 Parameter #43 V110/PIAFS frames transmitted:  0
 Parameter #44 V110/PIAFS sync lost:  0
Line Shape:
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
.....................................................................*
```

The following example shows performance statistics for modem 0/1 inside a Cisco AS5300. This modem is located at slot 0, port 1. For a description of the output fields, see Table 81.

```
Router# show modem operational-status 0/1

 Modem(0/1) Operational-Status:
   Parameter #0 Disconnect Reason Info: (0xDF00)
                Type (=6 ): Tx (host to line) data flushing, OK
              Class (=31): Requested by host
            Reason (=0 ): non-specific host disconnect
   Parameter #1   Connect Protocol:   LAP-M
   Parameter #2   Compression:   V.42bis both
   Parameter #3   EC Retransmission Count:   1
   Parameter #4   Self Test Error Count:   0
```

```
   Parameter #5   Call Timer:   36 secs
   Parameter #6   Total Retrains:   1
   Parameter #7   Sq Value:   3
   Parameter #8   Connected Standard:   V.90
   Parameter #9   TX,RX Bit Rate:   48000, 28800
   Parameter #11   TX,RX Symbol Rate:   8000, 3200
   Parameter #13   TX,RX Carrier Frequency:   0, 1920
   Parameter #15   TX,RX Trellis Coding:   0, 16
   Parameter #16   TX,RX Preemphasis Index:   0, 6
   Parameter #17   TX,RX Constellation Shaping:   Off, Off
   Parameter #18   TX,RX Nonlinear Encoding:   Off, Off
   Parameter #19   TX,RX Precoding:   Off, Off
   Parameter #20   TX,RX Xmit Level Reduction:   0, 0 dBm
   Parameter #21   Signal Noise Ratio:   36 dB
   Parameter #22   Receive Level:   -19 dBm
   Parameter #23   Frequency Offset:   0 Hz
   Parameter #24   Phase Jitter Frequency:   0 Hz
   Parameter #25   Phase Jitter Level:   0 degrees
   Parameter #26   Far End Echo Level:   -65 dBm
   Parameter #27   Phase Roll:   0 degrees
   Parameter #28   Round Trip Delay:   3 msecs
   Parameter #30   Characters received, transmitted:   12, 0
   Parameter #32   Characters received BAD:   1
   Parameter #33   PPP/SLIP packets received, transmitted:   0, 0
   Parameter #35   PPP/SLIP packets received (BAD/ABORTED):   0
   Parameter #36   EC packets transmitted, received OK:   2, 0
   Parameter #38   EC packets (Received BAD/ABORTED):   1
   Parameter #39   Robbed bit Signalling (RBS) pattern:   0
   Parameter #40   Digital Pad:   4.125 dB, Digital Pad Compensation: None
Line Shape:
 ........................*
 .........................*
 .........................*
 .........................*
 .........................*
 .........................*
 .........................*
 .........................*
 .........................*
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 .......................*
 ....................*
```

Table 81 show modem operational-status Field Descriptions for MICA Modems

Field	Description
Modem (slot/port) Operational Status:	This parameter identifies the modem.
Parameter #0 Disconnect Reason Info:	This parameter displays reasons for call disconnect.

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #1 Connect Protocol:	This parameter displays the connect protocol for the current session, which can be synchronous (SYNC) mode, asynchronous (ASYNC) mode, AppleTalk Remote Access (ARA) 1.0, ARA 2.0, Link Access Procedure for Modems (LAP-M), Microcom Network Protocol (MNP), FAX mode, Signalling System 7/Continuity Test (SS7/COT), or ISDN Mode.
Parameter #2 Compression:	This parameter displays the compression protocol used for the current connection, which can be None, V.42*bis* TX (transmit), V.42*bis* RX (receive), V.42*bis* both, or MNP5 data compression.
Parameter #3 EC Retransmission Count:	This parameter displays the error correction (EC) retransmission count, or the number of times the MICA technologies modem has gone into error recovery in the TX direction for a particular connection. The higher the number, the worse the connection. However, compare this parameter against the count produced by Parameter #36 (EC packets transmitted, received) to determine if there really is a problem.
Parameter #4 Self Test Error Count:	This parameter displays the total errors generated during a self-test run.
Parameter #5 Call Timer:	This parameter displays the length of the call in seconds. The timer starts when the CONNECT modem state is reached.
Parameter #6 Total Retrains:	This parameter displays the count of total retrains and speed shifts.
Parameter #7 Sq Value:	This parameter displays the measure of the receive signal quality (SQ) bit error rate for the chosen modulation, as estimated by the Digital Signal Processor (DSP), where 0 is the highest BER value and 7 the lowest. Depending on the setting of the SQ Threshold (S32), the DSP seeks an SQ value somewhere between the highest and lowest levels. For example, if S32 = 2 (the default), an SQ value of 3 is sought. If the SQ value drops below the threshold for longer than the duration of S35, the DSP attempts a downward speed shift or retrain. Similarly, if the SQ value goes above the threshold for longer than S34, an upward speed shift or retrain is attempted.
Parameter #8 Connected Standard:	This parameter displays the modulation, which can be V.21, Bell03, V.22, V.22*bis*, Bell212, V.23, V.32, V.32*bis*, V.32terbo, V.34, V.34+, K56Flex, V.90, V.110, or ISDN.

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #9 TX, RX Bit Rate:	This parameter displays the TX bit rate from the local data communication equipment (DCE) to the remote DCE and the RX bit rate from the remote DCE to the local DCE. The following data carrier connect standards support the rates indicated in bits per second (bps): • V.21 TX, RX—300 bps • V.22 TX, RX—1200 bps • V.22*bis* TX, RX—2400 bps • V.23 TX (originate)—1200 bps • V.23 RX (originate)—75 bps • V.32 TX, RX—4800 and 9600 bps • V.32*bis* TX, RX—4800, 7200, 9600, 12000, and 14400 bps • V.34 TX, RX—2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, and 28800 bps • V.34+ TX, RX—2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, and 33600 bps • K56Flex TX—32000, 34000, 36000, 38000, 40000, 42000, 44000, 46000, 48000, 50000, 52000, 54000, 56000, 58000, and 60000 bps • K56Flex RX—2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, and 31200 bps • V.90 TX—28000, 29333, 30666, 32000, 33333, 34666, 36000, 37333, 38666, 40000, 41333, 42666, 44000, 45333, 46666, 48000, 49333, 50666, 52000, 53333, 54666, and 56000 bps • V.90 RX—2400, 4800, 7200, 9600, 12000, 14400, 16800, 19200, 21600, 24000, 26400, 28800, 31200, and 33600 bps • Bell103 TX, RX—Up to 300 bps • Bell212 TX, RX—0 to 300 and 1200 bps The following fax connect standards support the rates indicated in bits per second (bps): • V.17 TX, RX—7200, 9600, 12000, and 14400 bps • V.27ter TX, RX—2400 and 4800 bps • V.29 TX, RX—7200 and 9600 bps

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #11 TX, RX Symbol Rate:	This parameter displays the TX symbol rate used to transmit samples to the line and the RX symbol rate used to receive samples from the line. The rates are synchronous with each other. The following data carrier connect standards support the indicated bit rates: • V.21 TX, RX—300 bps • V.22 TX, RX—600 bps • V.22bis TX, RX—600 bps • V.23 TX (originate)—1200 bps • V.23 RX (originate)—75 bps • V.23 TX (answer)—75 bps • V.23 RX (answer)—1200 bps • V.32 TX, RX—2400 bps • V.32*bis* TX, RX—2400 bps • V.34 TX, RX—2400, 2743, 2800, 3000, 3200, and 3429 bps • V.34+ TX,RX—2400, 2743, 2800, 3000, 3200, and 3429 bps • K56Flex TX—8000 bps • K56Flex RX—3200 bps • V.90 TX—8000 bps • V.90 RX—3000, 3200, and 3429 bps • Bell103 TX, RX—300 bps • Bell212 TX, RX—600 bps The following fax connect standards support the indicated bit rates: • V.17 TX, RX—2400 bps • V.27ter TX, RX—1800 bps • V.29 TX, RX—2400 bps

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #13 TX, RX Carrier Frequency:	This parameter displays the TX carrier frequency used by the local DCE and the RX carrier frequency used by the remote DCE. Data carrier frequencies are as follows: • V.21 TX RX—1080 Hz (originate) and 1750 Hz (answer) • V.22 TX, RX—1200 Hz (originate) and 2400 Hz (answer) • V.22*bis* TX, RX—1200 Hz (originate) and 2400 Hz (answer) • V.23 TX (originate)—1700 Hz • V.23 RX (originate)—420 Hz • V.23 TX (answer)—420 Hz • V.23 RX (answer)—1700 Hz • V.32 TX, RX—1800 Hz • V.32*bis* TX, RX—1800 Hz • V.34 TX, RX—1600, 1800, 1646, 1680, 1829, 1829, 1867, 1900, 1920, 1959 Hz • V.34+ TX, RX—1600, 1800, 1646, 1680, 1829, 1829, 1867, 1900, 1920, 1959 Hz • K56Flex TX—N/A • K56Flex RX—1600, 1800, 1646, 1680, 1829, 1829, 1867, 1900, 1920, 1959 Hz • V90 TX—N/A • V90 RX—1600, 1800, 1646, 1680, 1829, 1829, 1867, 1900, 1920, 1959 Hz • Bell103 TX, RX—1080 Hz (originate) and 1750 Hz (answer) • Bell212 TX, RX—1200 Hz (originate) and 2400 Hz (answer) Fax carrier frequencies are as follows: • V.17 TX, RX—1800 Hz • V.27ter TX, RX—1200 (originate) and 1600 (answer) • V.29 TX, RX—1700 Hz

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #15 TX, RX Trellis Coding:	Trellis coding adds dependency between symbols to make the detection in noise more robust (Forward Error Correction). Trellis coding is displayed in values of 0, 8, 16, 32, or 64. Use the following key to correlate the trellis code values with the connection standard: • 0—V.22, V.22*bis*, V.21, Bell212, Bell103, V.29, or V.27 • 8—V.32, V.32*bis*, or V.17 • 16, 32, 64—V.34, V.34+, V.90, K56Flex **Note** MICA technologies modems do not support values of 32 or 64 in the RX direction, but do support values of 16, 32, and 64 in the TX direction.
Parameter #16 TX, RX Preemphasis Index:	The preemphasis index involves shaping the raw transmit spectrum to deal with spectrum roll-offs. The preemphasis index can take on the values from 0 to 10. A zero denotes no reshaping. Typical values usually fall in the range from 0 to 2, or 6 to 7. This index is used with V.34 and V.34+ connection standards.
Parameter #17 TX, RX Constellation Shaping:	Constellation shaping is a technique for improving noise immunity by using a probability distribution for transmitted signal points. The signal states are used to predict the sensitivity to certain transmission impairments. Constellation shaping is used with the V.34 and V.34+ connection standards. Values displayed by this parameter are either none or active (Off or On).
Parameter #18 TX, RX Nonlinear Encoding:	Nonlinear encoding occurs during the training phase and moves the outer points of the constellation away to deal with nonlinear distortion. Nonlinear distortion (in the range from 0 to 200 Hz) tends to affect the higher-powered signals. Moving the outer constellation points out reduces the chance of error. Nonlinear encoding is used with the V.34 and V.34+ connection standards. Values displayed by this parameter are either none or active (Off or On). **Note** MICA technologies modems support nonlinear coding in both directions.
Parameter #19 TX, RX Precoding:	Precoding serves the same purpose as the preemphasis index, but instead manages the bits and not the raw transmit signals. This management is done only when asked for and therefore will occur only in the RX mode. Precoding is used with the V.34 and V.34+ connection standards. Values displayed by this parameter are either none or active (Off or On).

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #20 TX, RX Xmit Level Reduction:	The Xmit (transmit) level affects the transmit signal with 0 to 15 in dBm of reduction. If nonlinear distortion is detected, the MICA technologies modem will request a lower-powered TX signal. If the remote end detects nonlinear distortion, it will also request a lower-powered TX signal. Xmit level reduction is used with the V.34 and V.34+ connection standards. Values displayed by this parameter are the transmit signal and reduction, in dBm.
Parameter #21 Signal Noise Ratio:	A signal to noise ratio (SNR) is the ratio between the expected signal and the error signal. For example, consider a four-point constellation at (x,y) = (–1,1), (1,1), (1,–1), and (–1,–1). The receive signal comes in at (x,y^) = (0.5,1.5). The expected value, although not guaranteed, is (1,1). The error vector is then calculated as follows: e = (x – x^, y – y^) = ([1–0.5], [1–1.5]) = (0.5,–0.5) and the SNR is calculated as follows: SNR = 20*log10 [magnitude(expected value x,y of constellation) / magnitude(error)] SNR = 20 log10 [magnitude(1,1) / magnitude(0.5,–0.5)] = 6.02 dB This parameter displays the ratio measurement of the desired signal to noise. MICA technologies modems measure the SNR in only the signal band that has a rate equal to the baud rate (that is, 3200 Hz, 2400 Hz, and so on). Note that a 28.8-kbps connection demands an SNR of about 37 dB. If the rate is lower than this value, the quality of the connection diminishes. A 33.6-kbps connection demands an SNR of 38 to 39 dB. A clean line has an SNR of about 41 dB. The values displayed by this parameter range from 0 to 70 decibels (dB) and change in 1-dB steps.
Parameter #22 Receive Level:	The receive level is the power of the received signal and ranges from 0 to –128 dBm in 1-dBm incremental steps. The ideal range is about –22 dBm in the United States and –12 dBm in Europe. In theory, MICA technologies modems can handle a receive level up to –4 dBm. However, the receive level they can handle is a function of the echo level. If there is absolutely no echo, the MICA modem should be able to handle a –4 dBm level. As the echo level goes up, the receive level that the MICA modem can handle moves from –4 dBm to –5 dBm, and so on. The optimum range for the receive level displayed by this parameter is from –12 dBm to –24 dBm.

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #23 Frequency Offset:	Frequency offset is a difference between the modulation carriers—that is, the frequency shift in the receive spectrum between the expected RX carrier frequency and the actual RX carrier frequency. The values displayed by this parameter range from +/–32 in 0.125-Hz steps. The typical value is 0 Hz. **Note** Values of up to +/–7 Hz can be found on analog trunk circuits and will be compensated for by the MICA technologies modems.
Parameter #24 Phase Jitter Frequency:	Phase jitter frequency is the peak-to-peak differential between two signal points. The following calculation models a typical RX carrier: $e\hat{}j(wt + a)$ but when phase jitter is detected, the RX carrier is modeled as follows: $e\hat{}j[wt + a + K \sin(bt + c)]$ where: w = carrier frequency a = carrier phase K = magnitude of sinusoidal phase jitter b = frequency of sinusoidal phase jitter c = phase of sinusoidal phase jitter Uncanceled phase jitter looks like “rocking” of the baseband QAM constellation. The points look like arcs with the outer points having longer arcs. The phase jitter measurements displayed by this parameter range from +/–32 in 0.125-Hz steps. The typical value is 0 degrees (that is, phase jitter is not normally present). **Note** This phase jitter value is found only on analog trunk circuits. Typical frequencies are power generation frequencies and their harmonics (that is, 60, 120 Hz within the United States; 50, 100 Hz international). MICA technologies modems cancel all known frequencies.
Parameter #25 Phase Jitter Level:	Phase jitter level is the amount of phase jitter measured and indicates how large the “rocking” is, in degrees. On an oscilloscope, the constellation points would look like crescent moons. The jitter level corresponds to magnitude *K* as described in Parameter #24. Values displayed by this parameter can range up to 15 degrees. The typical value is 0 degrees (that is, phase jitter is not normally present).

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #26 Far End Echo Level:	Over long connections, an echo is produced by impedance mismatches at 2-wire-to-4-wire and at 4-wire-to-2-wire hybrid circuitry. This parameter displays the far-end echo level (that portion of the transmitted analog signal that has bounced off of the analog front end of the remote modem), which can range from 0 to –90 dBm. A MICA modem cannot handle near-end echo if far-end echo is present and the round-trip delay is greater than 10 microseconds. This constraint comes from the number of taps in the echo canceler of MICA modems. Assuming that there is no near-end echo, the performance of the receiver varies as the ratio of the receive level divided by the far-end echo (RECEIVE LEVEL/FAR END ECHO). As the echo level rises, the receiver performance degrades. (This is why the MICA modem can handle "hotter" receive levels with less echo.) The technical reason for this degradation has to do with *dynamic range*. Every echo canceler has some residual echo (error) left in the signal. This residual echo adds to the power of the receive signal going through the rest of the MICA modem receiver. With little residual echo, there is more dynamic range for the actual receive signal. For a call to go from the MICA modem to the local switch and back into MICA, the reported far-end echo level must be less than –55 dBm. A greater echo level indicates a digital-to-analog conversion in the path between the MICA modem and the switch. MICA modems are not supported in this topology.
Parameter #27 Phase Roll:	This parameter displays the phase roll, which affects the echo signal coming back to the MICA modem. A certain constellation pattern is transmitted from a MICA modem when the echo signal reaches the central office (CO). Some echoed form of this signal/constellation pattern is sent back to the MICA modem; however, the constellation shape may be rotated from 0 to 359 degrees. This rotation is called the *phase roll*. The echoed signal consists of a frequency component and a phase component. If the frequency component changes at all, a correction is needed for echo cancellation to work correctly. A slight variance (an unknown amount that would have to be determined through experimentation) in the phase may not affect how the echo canceler performs. Too much change in phase also needs correcting for proper echo cancellation to occur. The phase roll value ranges from +/–32 in 0.125-Hz steps. The typical value is 0 or close to 0.

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #28 Round Trip Delay:	Round-trip delay is the total round-trip propagation delay of the link in microseconds. This delay is important for proper echo cancellation. This parameter displays the round-trip delay; the amount of delay varies with each network. **Note** The buffer speed for MICA modems is 4096 bps; therefore, at 2400 bps the delay is 1.7 seconds, and at 3429 bps, 1.19 seconds. Because round-trip delay is measured before the bps rate is chosen, round-trip delay is used to disable those bit rates for which the round-trip delay cannot be supported. For example, if the round trip-delay is 1.25 seconds, 3429 is disabled for that train attempt.
Parameter #30 Characters transmitted, received:	This parameter displays the total count of characters (before modem compression of any type) received and transmitted.
Parameter #32 General Portware Information:	Not used.
Parameter #33 PPP/SLIP packets transmitted, received:	This parameter displays the total count of Point-to-Point Protocol (PPP) and Serial Line Internet Protocol (SLIP) packets transmitted and received. This total could include all PPP/SLIP packets, including BAD/ABORTED packets.
Parameter #35 PPP/SLIP packets received (BAD/ABORTED):	This parameter displays the total count of the bad or aborted PPP/SLIP packets, and is a subset of the counter shown in Parameter #33 (PPP/SLIP packets received). A counted PPP packet has a bad FCS, or the SLIP packet has a transparency error. Errored PPP frames should be displayed only when asynchronous framing (no EC protocol) is being used.
Parameter #36 EC packets transmitted, received OK:	This parameter displays the number of EC packets transmitted (the number of TX frames that the client modem has accepted) and the number of EC packets received (the number of RX frames that the MICA modem has accepted).
Parameter #38 EC packets (Received BAD/ABORTED):	Parameter #38 is identical to Parameter #3 (EC Retransmission Count). It may read differently from Parameter #3, depending on how the software requests the parameter information.
Parameter #39 Robbed Bit Signalling (RBS) pattern:	This parameter displays the number of robbed bits detected in the connection. The robbed bits are used for in-band signalling. This information is reported only for K56Flex by the analog modem. The six least significant bits of the returned value indicate the periodic RBS pattern, where a 1 denotes a pulse code modulation sample with a robbed bit.

Table 81 show modem operational-status Field Descriptions for MICA Modems (continued)

Field	Description
Parameter #40 Digital Pad, Digital Pad Compensation:	A digital pad can be implemented by the CO to attenuate a "hot" signal. Compensation boosts the signal by the amount of the pad. This parameter displays values that usually range from 0 to 10 dB, with typical values being 0, 3, and 6 dB. **Note** A digital pad is mandatory for K56Flex, but configurable for V.90 using S52. K56Flex supports only 0, 3, and 6 dB. V.90 supports steps of 1/8192 dB, but it is reported to the host in steps of 0.125-dB granularity.
Line Shape:	The display at the end of the report shows line shaping as a frequency-response graph of the channel. The *Y* (vertical) axis represents frequencies from 150 Hz (top of chart) to 3750 Hz (bottom of chart) in 150-Hz steps. The *X* (horizontal) axis represents a normalized amplitude. The graph can help identify nulls, bandwidth, and distortion (irregular shape). A flat spectrum plot is best. This display is available only for V.34, V.90, and K56Flex connection standards.

The following Microcom example shows details for an 8-port analog modem module inside a Cisco 3640 router. (For an explanation of the fields seen in this display, refer to the description of the **AT@E1** modem attention command in the document *AT Command Set and Register Summary for Analog Modem Network Modules*.)

```
Router# show modem operational-status 1/0

MNP Class 10 V.34 Modem
MODEM HW: PC 2W ANALOG  United States
Firmware Rev 2.2.48/85
DSP C36 Part/Rev              3635 4241
DSP C58 Part/Rev              3635 2041
DSP Controller Rev            0.0
DSP Data Pump Rev             0.0
Connect Time                  000:00:00
- RTS 5 CTS 6 DSR - CD 20 DTR - RI
Disconnect  Remote -   Local -

Mod Type                      IDLE
TX/RX Spd                     *****  ***** BPS
TX/RX Spd Mask                   NA  0000 Hex
Symbol Rate                   2400 Hz
TX/RX Carrier Freq            1800  1800 Hz
TX/RX States                    16    16
TX/RX NLE                      OFF   OFF
TX/RX Precoding                OFF   OFF
TX/RX Shaping                  OFF   OFF
TX Preemphasis Index             0

TX Lvl REG                    - 13 dBm
TX Lvl RAM                    -  0 dB
TX Lvl Reduct                    0 dB
TX Lvl                        - 13 dBm
RX Lvl                        - 57 dBm
S/NR                             0
```

```
S/DR                              0
EQM                          0000 Hex
AVG EQM                      0000 Hex
Lower/Upper Edge                  0      0 Hz
Phase Jitter Freq                 0 Hz
Phase Jitter Amp                0.0 deg
Far Echo Lvl                      0 N
Round Trip Delay                  0 msec
Dropouts > 5dB                    0
RTRNs Init/Accept                 0      0
RRENs Init/Accept                 0      0
BLER                         0000 Hex
RBS Counter                  0000 Hex
Digital Pad Detected              NA
Max SECRXB                   00
Max SECTXB                   00
OK
```

Related Commands

Command	Description
show modem configuration	Displays the current modem configuration for digital MICA modems loaded inside access servers or routers.
show modem log	Displays the modem history event status performed on a manageable modem or group of modems.
show modem mica	Displays information about MICA technologies digital modems.
show port operational-status	Displays the operational status of a specific modem port or port range for the Cisco AS5400 and AS5800 access servers.

show modem-pool

To display the configuration and connection status for one or more modem pools, use the **show modem-pool** command in EXEC mode.

show modem-pool [*pool-name*]

Syntax Description

pool-name	(Optional) Modem pool name.

Command Modes

EXEC

Command History

Release	Modification
11.2 P	This command was introduced.

Usage Guidelines

The counters displayed by the **show modem-pool** command are cleared with the **copy modem** command.

Examples

In the following example, two modem pools are set up: v90service and v34service. Each pool contains one Dialed Number Information Service (DNIS) number: 1234 and 5678, respectively. Each DNIS number is allowed a maximum of 48 simultaneous connections. A total of 96 modems are assigned to the modem pools: 48 and 48, respectively. Modems that are left unassigned to modem pools are automatically put into the default modem pool (displayed as System-def-Mpool). The default pool is empty in this example.

```
Router# show modem-pool

modem-pool: System-def-Mpool
modems in pool: 0   active conn: 0
0 no free modems in pool

modem-pool: v90service
modems in pool: 48  active conn: 46
 8 no free modems in pool
 called_party_number: 1234
   max conn allowed: 48, active conn: 46
   8 max-conn exceeded, 8 no free modems in pool

modem-pool: v34service
modems in pool: 48  active conn: 35
 0 no free modems in pool
 called_party_number: 5678
   max conn allowed: 48, active conn: 35
   0 max-conn exceeded, 0 no free modems in pool
```

Table 82 describes the significant fields shown in the display.

Table 82 show modem-pool Field Descriptions

Field	Description
modem-pool	Name of the modem pool. In the previous example, there are three modem pools configured: System-def-Mpool, v34service, and v90service. To set modem pool name, see the **copy modem** command. All the modems not assigned to a modem pool are automatically assigned to the system default pool (displayed as System-def-Mpool).
modems in pool	Number of modems assigned to the modem pool. To assign modems to a pool, see the **copy modem** command.
active conn	Number of simultaneous active connections for the specified modem pool or called party DNIS number.
no free modems in pool	Number of times incoming calls were rejected because there were no more free modems in the pool to accept the call.
called_party_number	Specified called party DNIS number. This is the number that the remote clients use to dial in to the access server. You can have more than one DNIS number per modem pool. To set the DNIS number, see the **copy modem** command.
max conn allowed	Maximum number of modems that a called party DNIS number can use, which is an overflow protection measure. To set this feature, see the **copy modem** command.
max-conn exceeded	Number of times an incoming call using this called party DNIS number was rejected because the **max-conn** *number* parameter specified by the **called-number** command was exceeded.

Related Commands

Command	Description
called-number (modem pool)	Assigns a called party number to a pool of modems.
clear modempool-counters	Clears active or running counters associated with one or more modem pools.
copy modem	Copies modem firmware to integrated modems in access servers.
modem-pool	Creates a new modem pool or specifies an existing modem pool, which allows you to physically or virtually partition your access server for dial-in and dial-out access.
pool-member	Assigns a range of modems to a modem pool.

show modem summary

To display a high-level report for all manageable modems dialing in to and out of the network, use the **show modem summary** command in EXEC mode.

show modem summary

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

The following is sample output from the **show modem summary** command:

```
Router# show modem summary

         Incoming calls       Outgoing calls      Busied   Failed   No    Succ
Usage  Succ    Fail  Avail    Succ    Fail  Avail    Out      Dial     Ans   Pct.
  17%  1547      64     11       0       0     11        0        3     3     96%
```

Table 83 describes the significant fields shown in the display.

Table 83 show modem summary Field Descriptions

Field	Description
Incoming and Outgoing calls	Calls dialing into and out of the modem. • Usage—Percentage of the total system uptime that all the modems are in use. • Succ—Total calls successfully connected. • Fail—Total calls that did not successfully connect. • Avail—Total modems available for use in the system.
Busied Out	Total number of times the modems were taken out of service with the **modem busy** command or the **modem shutdown** command.
Failed Dial	Total number of attempts the modems did not hang up or there was no dial tone.
No Ans	Total number of times call ringing was detected, but the calls were not answered by a modem.
Succ Pct.	Successful connection percentage of total available modems.

show modem test

To display the modem test log, use the **show modem test** command in EXEC mode.

show modem test

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The modem test log displays the results of the modem diagnostics test, which is issued with the **modem autotest** global configuration command.

Examples

The following is sample output from the **show modem test** command for a V.34 modem card:

```
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
.
.
.
```

Table 84 describes the significant field shown in the display.

Table 84 show modem test Field Descriptions

Field	Description
Date	Date the back-to-back test occurred for the specified modem.
Time	Time the test occurred.
Modem	Specified modem that performed a back-to-back test.
Test	Operation performed by the specified modem.
Reason	Reason the modem performed a back-to-back test.

Table 84 show modem test Field Descriptions (continued)

Field	Description
State	Current operational state of the modem.
Result	Result of the back-to-back test for the specified modem.

show modem version

To display version information about the modem firmware, controller and Domain Specific Part (DSP) ATM address field code (for 56K modems only), and boot code, use the **show modem version** command in EXEC mode.

show modem version

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.0(4)XI1	This command was enhanced to display Service Processing Element (SPE) features. The "–/–" in the DSP REV field indicates that the **spe** configuration commands for firmware download are unavailable on that modem.

Usage Guidelines

This command is useful for verifying the version of modem firmware running on the system before or after a modem firmware upgrade. If there is a "-/-" in the DSP REV field, you cannot use the **spe** configuration commands for firmware download on that modem.

Examples

The following example displays information for modem firmware, which includes modem firmware version, boot code version, controller and DSP code version (56K modem modules only), modem board hardware version, and carrier card information. This particular example displays information for Microcom 56K modem cards (modules 0/0, 2/0, and 2/1) and V.34 cards (module 0/1) installed in a Cisco AS5200.

If the version number is displayed as 0.0.0, verify that out-of-band status polling is functioning.

```
Router# show modem version

          Modem module    Firmware    Boot           DSP
  Mdm     Number          Rev         Rev            Rev
  0/0               0       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  0/1               0       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  .
  .
  .
0/11              0       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  0/12              1       2.2(8)   1.0(5)
  0/13              1       2.2(8)   1.0(5)
  .
  .
  .
0/23              1       2.2(8)   1.0(5)
  2/0               0       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  2/1               0       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  2/2               0       3.1(21)  3.0(4)    1.1(0)/1.1(0)
```

```
  .
  .
  .
2/21              1       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  2/22              1       3.1(21)  3.0(4)    1.1(0)/1.1(0)
  2/23              1       3.1(21)  3.0(4)    1.1(0)/1.1(0)

 Modem board HW version info:

 Slot 0:
   Carrier card:
     hw version= 8, number_of_ports= 24, max_modules= 2, max_oob_ports= 2
   Modem Module 0:
     number_of_modems= 12, option_bits= 1,
     rev_num= 02.00, vendor_model_number= 02,
     vendor_banner= Microcom MNP10 K56 Modem
   Modem Module 1:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.00, vendor_model_number= 01,
     vendor_banner= Microcom MNP10 V34 Modem

 Slot 2:
   Carrier card:
     hw version= 7, number_of_ports= 24, max_modules= 2, max_oob_ports= 2
   Modem Module 0:
     number_of_modems= 12, option_bits= 1,
     rev_num= 02.00, vendor_model_number= 02,
     vendor_banner= Microcom MNP10 K56 Modem
   Modem Module 1:
     number_of_modems= 12, option_bits= 1,
     rev_num= 02.00, vendor_model_number= 02,
     vendor_banner= Microcom MNP10 K56 Modem
```

The following example displays modem version information for V.110 terminal adapter modules:

```
Router# show modem version

              Modem module       Firmware    Boot
  Mdm             Number         Rev         Rev
  0/0               0            Unmanaged   Unmanaged
  0/1               0            Unmanaged   Unmanaged
  0/2               0            Unmanaged   Unmanaged
  .
  .
  .
  0/11              0            Unmanaged   Unmanaged
  1/0               0            Unmanaged   Unmanaged
  .
  .
  .
  1/11              0            Unmanaged   Unmanaged
  1/12              1            Unmanaged   Unmanaged
  .
  .
  .
  1/22              1            Unmanaged   Unmanaged
  1/23              1            Unmanaged   Unmanaged
  2/0               0            Unmanaged   Unmanaged
  .
  .
  .
  2/11              0            Unmanaged   Unmanaged
  2/12              1            Unmanaged   Unmanaged
```

```
  .
  .
  .
  2/22              1            Unmanaged   Unmanaged

Modem board HW version info:

 Slot 0:
   Carrier card:
     hw version= 3, number_of_ports= 12, max_modules= 1, max_oob_ports= 1
   Modem Module 0:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.01, vendor_model_number= 01,
     vendor_banner= V.110 Terminal Adaptor

 Slot 1:
   Carrier card:
     hw version= 8, number_of_ports= 24, max_modules= 2, max_oob_ports= 2
   Modem Module 0:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.01, vendor_model_number= 01,
     vendor_banner= V.110 Terminal Adaptor
   Modem Module 1:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.01, vendor_model_number= 01,
     vendor_banner= V.110 Terminal Adaptor

 Slot 2:
   Carrier card:
     hw version= 8, number_of_ports= 24, max_modules= 2, max_oob_ports= 2
   Modem Module 0:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.00, vendor_model_number= 01,
     vendor_banner= V.110 Terminal Adaptor
   Modem Module 1:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.00, vendor_model_number= 01,
     vendor_banner= V.110 Terminal Adaptor
```

The following example shows the display from a Cisco AS5300. If there is a "-/-" in the DSP REV field, you cannot use the **spe** configuration commands for firmware download on that modem.

```
Router# show modem version

          Modem module     Firmware   Boot          DSP
 Mdm      Number           Rev        Rev           Rev
 1/0               0        2.6.1.0
 1/1               0        2.6.1.0
 1/2               0        2.6.1.0
 1/3               0        2.6.1.0
 1/4               0        2.6.1.0
 1/5               0        2.6.1.0
 1/6               1        2.6.1.0
 .
 .
 .
 1/41              6        2.6.1.0
 1/42              7        2.6.1.0
 1/43              7        2.6.1.0
 1/44              7        2.6.1.0
 1/45              7        2.6.1.0
 1/46              7        2.6.1.0
 1/47              7        2.6.1.0
 2/0               0        5.0(40)  3.0(4)    22.0/47.0
```

```
  2/1               0       5.0(40)  3.0(4)    22.0/47.0
  2/2               0       5.1(9)   3.0(4)    22.0/47.0
  .
  .
  .
  2/8               0       5.1(9)   3.0(4)    22.0/47.0
  2/9               0       5.0(40)  3.0(4)    22.0/47.0
  2/10              0       5.1(9)   3.0(4)    22.0/47.0
  2/11              0       5.1(9)   3.0(4)    22.0/47.0
  2/12              1       2.3(6)   1.0(5)       -/-
  2/13              1       2.3(6)   1.0(5)       -/-
  .
  .
  .
Modem board HW version info:

Slot 1:
Carrier card:
     number_of_ports= 48, max_modules= 10
Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x47,
 Board Hardware Version 1.0, Item Number 73-2393-3,
 Board Revision A0, Serial Number 09361116,
 PLD/ISP Version 5.9, Manufacture Date 20-Jun-1998.

Modem Module 0
Manufacture Cookie Info:
 EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
 Board Hardware Version 1.0, Item Number 73-2522-2,
 Board Revision B48, Serial Number 06542204,
 PLD/ISP Version 255.255, Manufacture Date 23-Jun-1998.

Modem Module 1
Manufacture Cookie Info:
 EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
 Board Hardware Version 1.0, Item Number 73-2522-2,
 Board Revision B48, Serial Number 06478113,
 PLD/ISP Version 255.255, Manufacture Date 23-Jun-1998.
  .
  .
  .
Modem Module 7
Manufacture Cookie Info:
 EEPROM Type 0x0101, EEPROM Version 0x01, Board ID 0x06,
 Board Hardware Version 1.0, Item Number 73-2522-2,
 Board Revision B48, Serial Number 06478929,
 PLD/ISP Version 255.255, Manufacture Date 23-Jun-1998.

Modem Module 8

Modem Module 9

Slot 2:
   Carrier card:
     hw version= 2, pld= 0, number_of_ports= 24,
     max_modules= 2, max_oob_ports= 2
Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x47,
 Board Hardware Version 1.0, Item Number 73-2522-2,
 Board Revision ^@2, Serial Number 05433763,
 PLD/ISP Version 255.255, Invalid Date code.
```

```
   Modem Module 0:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.30, vendor_model_number= 02,
     vendor_banner= Microcom MNP10 K56 Modem
   Modem Module 1:
     number_of_modems= 12, option_bits= 1,
     rev_num= 03.00, vendor_model_number= 01,
     vendor_banner= Microcom MNP10 V34 Modem
Router#

Router# write terminal

Building configuration...

Current configuration:
!
version 12.0
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
service internal
!
hostname Router
!
aaa new-model
aaa group server radius aaa-server
 server 1.2.3.4
!
spe 1/0 1/7
 firmware location system:/ucode/mica_port_firmware
spe 2/0 2/1
 firmware location system:/ucode/microcom_firmware
spe 2/2 2/8
 firmware location flash:mcom-fw-dsp.5.1.9_47.22.bin
spe 2/9 2/9
 firmware location system:/ucode/microcom_firmware
spe 2/10 2/11
 firmware location flash:mcom-fw-dsp.5.1.9_47.22.bin
spe 2/12 2/23
 firmware location feature_card_flash
!

Router# termination length 0
```

Table 85 describes the significant fields shown in the displays of the **show modem version** command.

Table 85 show modem version Field Descriptions

Field	Description
Mdm	Slot and port number for the specified modem.
Modem module Number	Card number associated with the carrier card.
Firmware Rev	Modem firmware version, or one of the following: • Unknown—Indicates that the retrieved version is 0.0.0. • Unknown (F)—Indicates that the modem's out-of-band feature has failed. • Unknown (NP)—Indicates that the user has disabled the status polling for this modem using the **no modem status-polling** command.
Boot Rev	Modem boot version, or one of the following: • Unknown—Indicates that the retrieved version is 0.0.0. • Unknown (F)—Indicates that the modem's out-of-band feature has failed. • Unknown (NP)—Indicates that the user has disabled the status polling for this modem using the **no modem status-polling** command.
DSP Rev	Controller and DSP version, which is displayed for the 56K modems only. The first set of numbers correspond to the controller version. The second set of numbers, which begin with a forward slash (/), corresponds to the DSP version.
Modem board HW version info:	Modem hardware board information.
Slot	Slot number used for the carrier card.
Carrier card	Modem carrier card.
hw version	Modem carrier card hardware version.
number_of_ports	Maximum number of modem ports that can be installed in the carrier card.
max_modules	Maximum number of modem cards that can be installed in a carrier card.
max_oob_ports	Maximum number of out-of-band ports used in the carrier card.
Modem Module	Modem card.
number_of_modems	Number of modems installed in the modem card.
option_bits	Signal level of the modem A-law and the U-law.
rev_num	Modem card version number.
vendor_model_number	Vendor modem model number.
vendor_banner	Type of banner displayed by the modem vendor.

show modemcap

To display the values set for the current modem and list the modems for which the router has entries, use the **show modemcap** command in EXEC mode. To display the attributes associated with a specific modem, use the **show modemcap** command in EXEC mode with the optional *modem-type* argument.

show modemcap [*modem-type*]

Syntax Description

modem-type	(Optional) Modem type, such as a Codex 3260.

Defaults

The list of modems for which the router has entries.

Command Modes

EXEC

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

When a modem name is supplied, this command displays the available modem values.

As an alternative to repeatedly entering the same data, use templates as a way to join modemcap entries. For example, consider the following modemcap entries:

```
modemcap entry gv_basics:FD=&F:AA=S0=1:CD=&C1:DTR=&D2:NEC=E0:NRS=Q1
modemcap entry global_village:HFL=&K3\\X1:BCP=%C1:NCP=%C0:TPL=gv_basics
modemcap entry gv_teleport:NCP=%C0:TPL=gv_basics
```

To look up the factory default for a global_village modem, perform the following steps:

Step 1 Look at the global_village modemcap entry for the factory default (FD).

Step 2 If you fail to find FD in global_village, look at the global_village modemcap entry for a template (TPL).

Step 3 Find a TPL called “gv_basics.”

Step 4 Look in the gv_basics modemcap entry for the FD.

Step 5 Find FD=&F in the gv_basics modemcap entry.

Step 6 Use &F as the FD for the global_village.

Examples

The following example shows the modem values in a Codex 3260:

```
Router# show modemcap codex_3260

Modemcap values for codex_3260
Factory Defaults (FD):  &F
Autoanswer (AA):  S0=1
Carrier detect (CD):  &C1
Drop with DTR (DTR):  &D2
Hardware Flowcontrol (HFL):  *FL3
Lock DTE speed (SPD):  *SC1
DTE locking speed (DTE):  [not set]
Best Error Control (BER):  *SM3
Best Compression (BCP):  *DC1
No Error Control (NER):  *SM1
No Compression (NCP):  *DC0
No Echo (NEC):  E0
No Result Codes (NRS):  Q1
Software Flowcontrol (SFL):  [not set]
Caller ID (CID):  &S1
On-hook (ONH):  H0
Off-hook (OFH):  H1
Miscellaneous (MSC):  [not set]
Template entry (TPL):  default
Modem entry is built-in.
```

Table 86 identifies and describes the list of attributes.

Table 86 Modem Attributes

Modem Attribute	Description
Factory defaults (FD)	Returns the modem to factory default configuration. This is commonly “&F.”
Autoanswer (AA)	Sets the modem to answer the phone if data terminal ready (DTR) is high, preferably on the first ring. This is commonly “S0=1.”
Carrier detect (CD)	Instructs the modem to raise the CD signal when a carrier is detected. Cisco configures modems into auto-answer mode by default. This is not the default for most modems, which just raise CD and leave it high. This is commonly “&C1.” In auto-answer mode, the modem waits until it detects a ring, then responds to the incoming call and negotiates an end-to-end connection with the other modem. At this point, the modem receiving the call informs the router that it has a call ready to be processed; this notification is performed by raising the signal on EIA/TIA-232 pin 8 (the Data Carrier Detect signal) to high.
Drop with DTR (DTR)	Drops the connection if DTR signal drops. There is frequently an option to reset the configuration while this drop occurs; however, this option should *not* be used. The connection should only drop. The correct value for this is commonly “&D2.”
Set Hardware Flowcontrol (HFL)	Uses ready to send/clear to send (RTS/CTS) out-of-band flow control.
Set Software flowcontrol (SFL)	Uses transmit on/transmit off (XON/XOFF) in-band flow control.

Table 86 Modem Attributes (continued)

Modem Attribute	Description
Lock DTE speed (SPD)	Instructs the modem to lock the speed at which it communicates to the router to a single rate, preferably the highest. This attribute is important and is often hard to find in manuals. SPD is often linked to the hardware flow control variable. Look for phrases like “bps rate adjust” and “bit rate adjust.” Some modems set the speed to a value that depends on an S-register; other modems simply lock to the speed that was used when the last AT command was issued. Locking to the speed that was last used is handled automatically. To enable the S-register to set the speed, you must include the proper S-register value for the fastest possible DTE speed.
Best Error Control (BER)	Instructs the modem to negotiate its best error control with remote modems. For ARAP users, this is Microcom Network Protocol (MNP) 5/Link Access Procedure, Balanced (LAPB), but not MNP4.
Best Compression (BCP)	Instructs the modem to negotiate its best compression with remote modems.
No Error Control (NER)	Instructs the modem to negotiate no error control with remote modems. This attribute will be used when placing outgoing (callback) AppleTalk Remote Access protocol (ARAP) calls.
No Compression (NCP)	Instructs the modem to negotiate no compression with remote modems. This attribute is used when placing outgoing (callback) ARAP calls.
No Echo (NEC)	Requests the modem *not* to echo characters. This attribute is commonly “E0.”
No Result Codes (NRS)	Requests the modem *not* to send a response when you issue a command. This attribute is commonly “Q1.”
Caller ID (CID)	Requests that Caller ID information be returned when dial in occurs. Not used.
Miscellaneous (MSC)	Sends any extra commands that are needed for the modem to work (possibly with specific platforms).
Template entry (TPL)	This is the name of another modem type. It is referenced as the value of any of the previously listed attributes if they are not set on the current modem type.

Related Commands

Command	Description
modemcap edit	Changes a modem value that was returned from the **show modemcap** command.
modemcap entry	Stores and compresses information about the capability of a specified modem.

show nbf cache

To display NetBIOS name cache contents, use the **show nbf cache** command in EXEC mode.

show nbf cache

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.1	This command was introduced.

Examples

The following is sample output from the **show nbf cache** command:

```
Router# show nbf cache

HW Addr           Name        How     Idle   NetBIOS Packet Savings
1000.5a89.449a    IKBA         E0      6      0
0000.0000.0000    NANOO        async1  21     0
```

Table 87 describes significant fields shown in the display.

Table 87 show nbf cache Field Descriptions

Field	Description
HW Addr	MAC address mapped to the NetBIOS name in this entry.
Name	NetBIOS name mapped to the MAC address in this entry.
How	Interface through which this information was learned.
Idle	Period of time (in seconds) since this entry was last accessed. A hyphen in this column indicates a static entry in the NetBIOS name cache.
NetBIOS Packet Savings	Number of packets to which local replies were made (thus preventing transmission of these packets over the network).

Related Commands

Command	Description
ppp multilink group	Restricts a physical link to joining only a designated multilink-group interface.
netbios access-list	Defines an IPX NetBIOS FindName access list filter.
netbios input-access-filter host	Defines a station access list filter on incoming messages. The access lists of station names are defined in **netbios access-list** host commands.
netbios name-cache	Defines a static NetBIOS name cache entry, tying the server with the name netbios-name to the mac-address, and specifying that the server is accessible either locally through the interface-name specified, or remotely through the ring-group group-number specified.
netbios output-access-filter host	Defines a station access list filter on outgoing messages.
show nbf sessions	Displays NetBEUI connection information.

show nbf sessions

To display NetBEUI connection information, use the **show nbf sessions** command in EXEC mode.

show nbf sessions

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

Release	Modification
11.1	This command was introduced.

Examples

The following is sample output from the **show nbf sessions** command:

```
Router> show nbf sessions

Async6 NetBIOS Session Table:
Srcnum   Destnum  Dest-Interface DestMAC
8        6         Ethernet0 00aa.005b.c17b

NetBIOS Global Session Table:
Srcnum   Destnum   Dest-Interface DestMAC  Src-Interface SrcMac(I)


6        8         Async7 0000.0000.0000  Ethernet0 00aa.005b.c17b(95)
ADD_[GROUP]NAME_QUERY queuesize=0
STATUS_QUERY queuesize=0
STATUS_RESPONSE queuesize=0
NAME_QUERY queuesize=0
NAME_RECOGNIZED queuesize=0
SESSION_INITIALIZE queuesize=0
SESSION_INITIALIZE (pending) queuesize=0
```

Table 88 describes the significant fields shown in the display.

Table 88 show nbf sessions Field Descriptions

Field	Description
Interface NetBIOS Session Table:	Summarizes Async/ISDN interface NetBIOS connection information.
Srcnum, Destnum	Source and destination connection numbers.
Dest-Interface, DestMAC	Destination interface and MAC address.
Global NetBIOS Session Table:	Summarizes LAN NetBIOS connection information.
Dest-Interface DestMAC	Destination interface (Async7 in this case) and MAC address (0000.0000.0000 in this case).

Table 88 show nbf sessions Field Descriptions (continued)

Field	Description
Src-Interface SrcMac	Source interface (Ethernet0 in this case) and MAC address (00aa.005b.c17b(95) in this case).
NetBIOS Datagram Queue Summary:	Summarizes NetBIOS pending datagram queues.
ADD_[GROUP]NAME_ QUERY	Add Group Name Query packets.
STATUS_QUERY	Status Query packets.
STATUS_RESPONSE	Status Response packets.
NAME_QUERY	Name Query packets.
NAME_RECOGNIZED	Name Recognized packets.
SESSION_INITIALIZE (pending)	NetBIOS session Initialize packets.

Related Commands

Command	Description
ppp multilink group	Restricts a physical link to joining only a designated multilink-group interface.
netbios access-list	Defines an IPX NetBIOS FindName access list filter.
netbios input-access-filter	Controls incoming IPX NetBIOS FindName messages.
netbios name-cache	Defines a static NetBIOS name cache entry, tying the server with the name netbios-name to the mac-address, and specifying that the server is accessible either locally through the interface-name specified, or remotely through the ring-group group-number specified.
netbios output-access-filter	Controls outgoing NetBIOS FindName messages.
show nbf cache	Displays NetBIOS name cache contents.