

Digital Modem Network Module for the Cisco 3640

Feature Summary

The Digital Modem Network Module for the Cisco 3640 is a high-density digital network module containing 6, 12, 18, 24, or 30 digital (MICA) modems. These modems provide a direct digital connection to an Integrated Services Digital Network (ISDN) Primary Rate Interface (PRI) channel. This digital modem network module allows the access server to support a mix of both digital data calls (ISDN) and analog modem calls over a single digital network interface.

Depending on the modem license you purchase with your Cisco 3640, the modems on the Digital Modem Network Module are either manageable or not manageable by Cisco IOS software commands. If the license you purchase includes this modem management capability, you can use the modem management commands to gather call and performance statistics at any time, even if there is an active call on the modem.

Benefits

The Digital Modem Network Module for the Cisco 3640 provides the following benefits:

- Enables you, as the Enterprise customer, to support a mix of digital (ISDN) and POTS analog modem calls over a single digital network interface.
- Modem management commands enable you to gather call and performance statistics.
- Supports 56 kbps modem connections via the K56 Flex and V.90 standards when the portware for these standards becomes available.

List of Terms

E1—European digital carrier facility used for transmitting data through the telephone hierarchy. The transmission rate for E1 is 2.048 Mbps.

Integrated Services Digital Network (ISDN)—Communication protocols supported by telephone companies to permit telephone networks to carry voice and traffic.

K56Flex—Proprietary modem standard proposed by Rockwell International allowing full-duplex communications with asymmetrical data rates up to 60 kbps. K56 Flex allows the digital modem to transmit data at up to 60 kbps and receive data at up to V.34+ speeds.

Modem ISDN Channel Aggregation (MICA)—72-pin Telebit modem card capable of handling up to six modem sessions.

Pulse Code Modulation (PCM)—Transmission of analog information in digital form through sampling and then encoding the samples with a fixed number of bits. All analog data sent to and from the digital modem has been encoded via PCM.

Primary Rate Interface (PRI)—Associated with ISDN. For T1, PRI consists of 23 B (bearer) channels and 1 D (data) channel. For E1, PRI consists of 30 B channels and 1 D channel.

T1—North American digital carrier facility used for transmission of data through the telephone hierarchy. The transmission rate for T1 is 1.544 Mbps.

V.34—ITU-T standard that defines how modems should operate at 28.8 kbps.

V.34+—ITU-T standard that defines how modems should operate at speeds up to 33.6 kbps.

V.90—ITU-T modem standard for 56 Kbps connections.

Platforms

This feature is supported on the Cisco 3600 series routers.

Prerequisites

Before you can configure a modem interface, complete the following prerequisite tasks:

- Install a PRI network module and another module (such as Ethernet) to provide connectivity to the LAN. Digital modem network modules do not provide physical network interfaces of their own, but instead handle analog calls passing through the PRI network module. The PRI module is capable of concurrently handling digital ISDN data and remote voice-channel (analog) modem connections. The digital modem module provides a pool of available modems that can be used for both incoming and outgoing calls.

For information on how to correctly install a PRI network module, refer to the *1-Port and 2-Port ISDN-PRI Network Module Configuration Note*. For information on how to install an Ethernet module, refer to the *1-Port Ethernet Network Module Configuration Note* or the *4-Port Ethernet Network Module Configuration Note*. For other modules, refer to the specific configuration notes pertaining to them.

Note The PRI module must be hardware revision -03; earlier revisions are incompatible with digital modem modules. For more information, refer to the “Software and Hardware Requirements” section in the *Digital Modem Network Module Configuration Notes*.

- Install the Digital Modem Network Module in a chassis slot. For information on how to correctly install this network module, refer to the “Installing a Digital Modem Network Module in a Chassis Slot” section in the *Digital Modem Network Module Configuration Note*.
- Complete basic device configuration, including host name, username, protocol, and security configuration. For more information about basic device configuration, refer to the *Cisco 3620 Installation and Configuration Guide* or the *Cisco 3640 Installation and Configuration Guide*.

- Make sure that you have the following information:
 - ISDN PRI Switch type
 - T1 (or E1) information, such as line code and framing type
 - Channel-group information and time-slot mapping

Supported MIBs and RFCs

No RFCs are supported by this feature.

This feature supports the following Management Information Bases (MIBs):

- CISCO-MODEM-MGMT-MIB
- CISCO-POP-MGMT-MIB

For descriptions of supported MIBs and how to use MIBs, see Cisco's MIB website on CCO at <http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>.

Configuration Tasks

Complete the following tasks to configure the digital modem module interfaces:

- Configure the E1/T1 Network Module for ISDN PRI
- Configure the ISDN D-Channel Serial Interfaces
- Configure the Loopback Interface
- Configure the LAN Interface
- Create the Group Asynchronous Interface
- Configure the ISDN Dialer Interface
- Configure the Default IP Pool Information
- Configure Modem Lines for Dial-In and Dial-Out

These tasks are described in the following sections.

Configure the E1/T1 Network Module for ISDN PRI

The first step in configuring a digital modem interface is to configure ISDN PRI on either a channelized T1 or E1 controller, depending on the ISDN service in your area. The Cisco 3600 series ISDN PRI network modules can have either one or two ports; if the ISDN PRI module installed in your device has two ports, you need to apply the following procedure to both ports.

Configure Channelized E1 ISDN PRI

To configure ISDN PRI on a channelized E1 controller, perform the following tasks, beginning in global configuration mode:

Select a service provider switch type that accommodates PRI. Table 1 shows a list of supported switch types.	isdn switch-type <i>switch type</i>
Specify a controller type and define its location in the Cisco 3640.	controller e1 <i>slot/unit</i>
Define the framing characteristics as cyclic redundancy check 4 (CRC4).	framing crc4
Define the line code as high-density bipolar 3 (HDB3).	linecode hdb3
Configure ISDN PRI. This command specifies the time slots on the T1 line to be allocated to PRI service.	pri-group [<i>timeslots range</i>]

Note The values used in this procedure for the **framing** and **linecode** commands are examples only. Use the framing type and line encoding specified by your E1 service provider.

Table 1 ISDN PRI Switch Types

Country	ISDN Switch Type
Australia	primary-ts01
Europe	primary-net5
Japan	primary-ntt
North America	primary-4ess primary-5ess primary-dms100

For more information about configuring ISDN PRI on a channelized E1 controller, refer to the “Configure ISDN PRI” section of the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Configure Channelized T1 ISDN PRI

To configure ISDN PRI on a channelized T1 controller, perform the following tasks, beginning in global configuration mode:

Select a service provider switch type that accommodates PRI. Table 1 shows a list of supported switch types.	isdn switch-type <i>switch type</i>
Specify a controller type and define its location in the Cisco 3640.	controller t1 <i>slot/unit</i>
Specify the clock source for the selected module.	clock source line
Define the framing characteristics as extended superframe format (ESF).	framing esf

Define the line code as binary 8 zero substitution (B8ZS)	linecode b8zs
Configure ISDN PRI. This command specifies the time slots on the T1 line to be allocated to PRI service.	pri-group [timeslots range]

Note The values used in this procedure for the **framing** and **linecode** commands are examples only. Use the framing type and line encoding specified by your E1 service provider.

For more information about configuring ISDN PRI on a channelized T1 controller, refer to the “Configure ISDN PRI” section of the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Note Any router configured for ISDN support must be connected to the same switch type on all of its ISDN interfaces.

Configure the ISDN D-Channel Serial Interfaces

When you configure ISDN PRI on the channelized E1 or channelized T1 controller, you create a corresponding D-channel serial interface used to carry signaling messages for that PRI group. For E1 serial interfaces, slot/port 0:15 is the D-channel. For T1 modules, serial interface 0:23 is the D-channel. You must configure this signaling interface to receive incoming and modem calls.

As mentioned, the PRI Network Module for the Cisco 3600 series can have either one or two ports. Because of this, you might have multiple D-channels to configure.

Configure the ISDN D-Channel Serial Interface for E1 Modules

To configure the ISDN D-channel serial interface for E1 modules, perform the following tasks, beginning in global configuration mode:

Specify the D-channel of the first PRI line and switch to the interface configuration mode.	interface Serialslot/port:15
Disable IP processing on this interface.	no ip address
Set the Point-to-Point Protocol (PPP) as the encapsulation method used by this interface.	encapsulation ppp
Configure all incoming voice calls to go to the modems.	isdn incoming-voice modem
Create a rotary dialer group.	dialer rotary-group number
Assign the D-channel interface(s) to the defined rotary dialer group.	dialer-group number
Disable fair weighted queuing for this interface.	no fair-queue
Disable Cisco Discovery Protocol (CDP) on this interface.	no cdp enable

For more information about configuring E1 ISDN D-channel serial interfaces, refer to the “Configure ISDN PRI” section in the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Configure the ISDN D-Channel Serial Interface for T1 Modules

To configure the ISDN D-channel serial interface for T1 modules, perform the following tasks, beginning in the global configuration mode:

Specify the D-channel of the first PRI line and switch to the interface configuration mode.	interface Serialslot/port:23
Disable IP processing on this interface.	no ip address
Set the Point-to-Point Protocol (PPP) as the encapsulation method used by this interface.	encapsulation ppp
Configure all incoming voice calls to go to the modems.	isdn incoming-voice modem
Create a rotary dialer group.	dialer rotary-group number
Assign the D-channel interface(s) to the defined rotary dialer group.	dialer-group number
Disable fair weighted queuing for this interface.	no fair-queue
Disable CDP on this interface.	no cdp enable

For more information about configuring T1 ISDN D-channel serial interfaces, refer to the “Configure ISDN PRI” section in the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Configure the Loopback Interface

The loopback 0 interface is the interface dial-in users access when dialing in to the network. Usually, all dial-in users are assigned to a single IP subnet. This subnet can be identified with the loopback 0 interface, a logical interface whose network number can be borrowed by each asynchronous dial-in interface.

To configure the loopback 0 interface, perform the following tasks, beginning in global configuration mode:

Select the loopback 0 interface.	interface Loopback number
Assign an IP address and subnet mask to the loopback 0 interface.	ip address ip-address ip-address mask

Configure the LAN Interface

The next task you need to perform is to configure the LAN interfaces on your Cisco 3600 series router. For the purpose of this procedure, we are showing how to configure an Ethernet interface. If the interface you are configuring is different, refer to the “Configuring LAN Interfaces” chapter in the Cisco IOS Release 11.3 *Configuration Fundamentals Configuration Guide* or to the configuration notes that came with your module.

To configure an Ethernet interface, perform the following tasks, beginning in global configuration mode:

Select the Ethernet interface.	interface ethernet <i>slot/port</i>
Assign an IP address and subnet mask to the Ethernet interface.	ip address <i>ip-address ip-address mask</i>
Enable this interface	no shutdown

Note The Ethernet and loopback interfaces should be on different subnets.

Create the Group Asynchronous Interface

A group asynchronous interface is a parent interface that applies protocol characteristics to specified, associated asynchronous interfaces. After you create a group asynchronous interface, all associated asynchronous interfaces (called members) can be configured through it. Group asynchronous interfaces can speed configuration time and help you maintain interface configuration consistency.

To configure a group asynchronous interface, perform the following tasks, beginning in global configuration mode:

Create a group asynchronous interface.	interface group-async <i>number</i>
Enable IP processing on the loopback interface without assigning an explicit IP address to the interface.	ip unnumbered <i>Loopbacknumber</i>
Set the Point-to-Point Protocol (PPP) as the encapsulation method used by this interface.	encapsulation ppp
Enable SLIP and PPP EXEC commands on this interface.	async mode interactive
Specify an IP address from the defined IP address pool to be returned to a remote peer connecting to this interface.	peer default ip address pool <i>name</i>
Disable CDP on this interface.	no cdp enable
Associate one or more interfaces to the group interface so that all associated interfaces can be configured through the group interface.	group-range <i>start-range end-range</i>

For more information about group asynchronous interfaces, refer to the “Asynchronous Configuration Task List” section of the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Configure the ISDN Dialer Interface

The ISDN dialer interface is the parent interface that holds the central protocol characteristics for the ISDN D channels that are part of the dialer-rotary group. To configure the ISDN dialer interface, perform the following tasks, beginning in global configuration mode:

Define a dialer rotary group leader.	interface Dialer <i>number</i>
Enable IP processing on the loopback interface without assigning an explicit IP address to the interface.	ip unnumbered <i>Loopbacknumber</i>
Disable IP multicast fast switching.	no ip mroute-cache
Set the PPP as the encapsulation method used by this interface.	encapsulation ppp
Specify an IP address from the defined IP address pool to be returned to a remote peer connecting to this interface.	peer default ip address pool <i>name</i>
Specify that dial-on-demand routing (DDR) be supported.	dialer in-band
Assign this interface to the rotary dialer group.	dialer-group <i>number</i>
Disable fair weighted queuing for this interface.	no fair-queue
Disable CDP on this interface.	no cdp enable
Enable Multilink PPP on this interface.	ppp multilink
Configure the enhanced IGRP routing process.	router eigrp <i>autonomous-system-number</i>
Enable Enhanced IGRP.	network <i>network-number</i>
Disable sending routing updates on this interface.	passive-interface <i>Dialer number</i>
Transmit subprefix routing information across classful network boundaries.	no auto-summary

For more information about configuring ISDN dialer interfaces, refer to the Cisco IOS Release 11.3 *Dial Solutions Configuration Guide*.

Configure the Default IP Pool Information

You need to set a range of IP addresses in the default IP pool. These IP addresses are used for dial-in users. To set the range of addresses, perform the following task in global configuration mode:

Set the range of addresses in the default IP pool to be assigned to inbound callers.	ip pool local default <i>low-ip-address</i> <i>[high-ip-address]</i>
Define a default gateway (router) when IP routing is disabled.	ip default gateway <i>number</i>
Forward packets destined for a subnet of a network that has no network default route.	ip classless

For more information about defining IP pool information, refer to the Cisco IOS Release 11.3 *Network Protocols Configuration Guide, Part 1*.

Configure Modem Lines for Dial-In and Dial-Out

The final task in configuring the MICA digital modem network modules is to configure the modem lines for dial-in and dial-out.

Configure the Modem for Dial-In

To configure the modem lines for dial-in, perform the following tasks, beginning in global configuration mode:

Select the modem lines for dial-in and switch to the line configuration mode.	line <i>start-range end-range</i>
---	--

Set the router to display a login prompt to modem callers.	autoselect during-login
--	--------------------------------

Set the router to shift automatically to PPP mode if it detects an incoming PPP packet.	autoselect ppp
---	-----------------------

Configure the line for both incoming and outgoing calls.	modem inout
--	--------------------

Configure the Modem for Dial-Out

To configure the modem lines for dial-out, perform the following tasks, beginning in global configuration mode:

Select the modem lines for dial-out and switch to the line configuration mode.	line <i>start-range end-range</i>
--	--

Set the router to use previously-defined rotary group.	rotary <i>number</i>
--	-----------------------------

Configure the router to accept inbound Telnet connections.	transport input telnet
--	-------------------------------

This configuration procedure ensures that a user trying to dial out using Telnet is connected to the first free line in the rotary group.

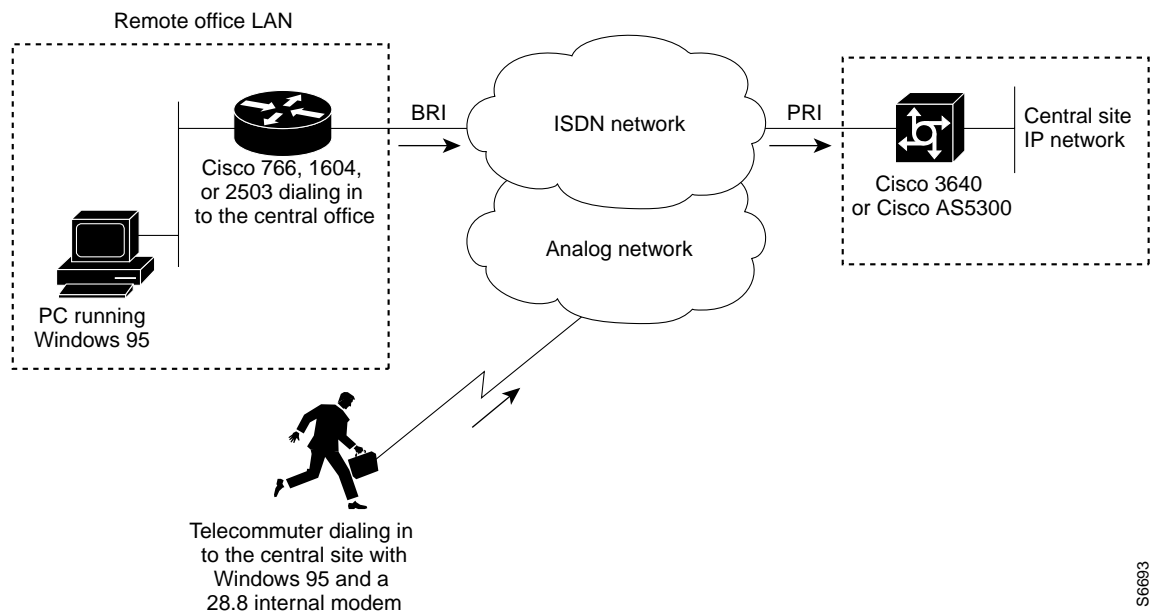
Configuration Example

Cisco 3640 Central Site Configuration to Support ISDN and Modem Calls

The following configuration allows remote LANs and standalone remote users with modems to dial in to a central site. Figure 1 shows the network topology.

In this example, the remote office places digital calls. The telecommuter places analog calls. The remote office router can be any Cisco router with a BRI interface, such as a Cisco 766, 1604, or 2503. The central office gateway router is a Cisco 3640 (or Cisco AS5300), which supports both PRI and analog connections.

Figure 1 Remote Office and Telecommuter Dialing In to a Central Site



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The Cisco 3640 has the following hardware configuration for this scenario:

- One 2-port ISDN-PRI network module installed in slot 1
- One digital modem network module installed in slot 2 and slot 3
- One 1-port Ethernet network module installed in slot 0

Note Each MICA digital modem card has its own group async configuration. Additionally, a single range of async lines is used for each modem card. For additional interface numbering information, refer to the *Digital Modem Network Module Configuration Note*.

```

!
version 11.2
service timestamps debug datetime msec
service timestamps log datetime msec
service password-encryption
no service udp-small-servers
no service tcp-small-servers
!
hostname NAS
!
aaa new-model
aaa authentication login default local
aaa authentication login console enable
aaa authentication login vty local
aaa authentication login dialin local
aaa authentication ppp default local
aaa authentication ppp dialin if-needed local
enable secret cisco
!
username admin password cisco
username remotelan1 password dialpass1
username remotelan2 password dialpass2
username PCuser1 password dialpass3

```

```
username PCuser2 password dialpass4
async-bootp dns-server 10.1.3.1 10.1.3.2
isdn switch-type primary-5ess
!
controller T1 1/0
 framing esf
 clock source line
 linecode b8zs
 pri-group timeslots 1-24
!
controller T1 1/1
 framing esf
 clock source line
 linecode b8zs
 pri-group timeslots 1-24
!
interface Loopback0
 ip address 10.1.2.254 255.255.255.0
!
interface Ethernet0/0
 ip address 10.1.1.10 255.255.255.0
 ip summary address eigrp 10 10.1.2.0 255.255.255.0
!
interface Serial 1/0:23
 no ip address
 encapsulation ppp
 no keepalive
 isdn incoming-voice modem
 dialer rotary-group 0
 dialer-group 1
 no fair-queue
 no cdp enable
!
interface Serial 1/1:23
 no ip address
 encapsulation ppp
 no keepalive
 isdn incoming-voice modem
 dialer rotary-group 0
 dialer-group 1
 no fair-queue
 no cdp enable
!
interface Group-Async1
 ip unnumbered Loopback0
 encapsulation ppp
 async mode interactive
 peer default ip address pool dialin_pool
 no cdp enable
 ppp authentication chap pap dialin
 group-range 65 88
!
interface Group-Async2
 ip unnumbered Loopback0
 encapsulation ppp
 async mode interactive
 peer default ip address pool dialin_pool
 no cdp enable
 ppp authentication chap pap dialin
 group-range 97 120
!
interface Dialer0
 ip unnumbered Loopback0
 no ip mroute-cache
 encapsulation ppp
```

Configuration Example

```
peer default ip address pool dialin_pool
dialer in-band
dialer-group 1
no fair-queue
no cdp enable
ppp authentication chap pap dialin
ppp multilink
!
router eigrp 10
network 10.0.0.0
passive-interface Dialer0
no auto-summary
!
ip local pool dialin_pool 10.1.2.1 10.1.2.50
ip default-gateway 10.1.1.1
ip classless
!
dialer-list 1 protocol ip permit
!
line con 0
login authentication console
line 65 88
autoselect ppp
autoselect during-login
login authentication dialin
modem DialIn
line 97 120
autoselect ppp
autoselect during-login
login authentication dialin
modem DialIn
line aux 0
login authentication console
line vty 0 4
login authentication vty
transport input telnet rlogin
!
end
```

Command Reference

This section provides information about new or modified commands for the Cisco 3640. All other commands used with this device are documented in the Cisco IOS Release 11.3 command references.

- **clear modem**
- **clear modem log**
- **isdn incoming-voice**
- **modem bad**
- **modem buffer-size**
- **modem country mica**
- **modem shutdown**
- **show controllers async**
- **show interfaces async**
- **show modem**
- **show modem call-stats**
- **show modem configuration**
- **show modem connect-speeds**
- **show modem csm**
- **show modem group**
- **show modem log**
- **show modem operational-status**
- **show modem summary**
- **show modem version**

- **show modem group**
- **show modem operational-status**
- **show modem summary**

clear modem

To reset the specified manageable modems on an access server or router, use the **clear modem** Privileged EXEC command:

```
clear modem {slot/port | modem-group | all}
```

Syntax Description

<i>slot/port</i>	Specifies the slot and port location of the modem. Valid <i>slot</i> entries are from 0 to 3. Valid <i>port</i> entries are from 0 to 29.
<i>modem-group</i>	Specifies the location of a specific group of modems. Valid entries are defined modem groups from 1 to 1002.
all	Resets all manageable modems on the access server.

Default

Disabled

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)T.

Use the clear modem command to rest a specific modem or group of modems on the AS5300. This command will disconnect an active call.

Examples

The following example resets all manageable modems on the Cisco 3640:

```
clear modem all
```

Related Commands

clear modem counters
clear modem group
clear modem log

clear modem log

To clear the modem event log for a specified manageable modem, use the **clear modem log** Privileged EXEC command:

```
clear modem log [slot/port | modem-group]
```

Syntax Description

<i>slot/port</i>	Specifies the slot and port location of the modem. Valid <i>slot</i> entries are from 0 to 3. Valid <i>port</i> entries are from 0 to 29.
<i>modem-group</i>	Specifies the location of a specific group of modems. Valid entries are defined modem groups from 1 to 1002.

Default

Disabled

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)T.

The modem event log displays history and status information of the MICA modems installed in the Cisco 3640, including modem state transitions, static link information, and final link information. The **clear modem log** command clears the event log for a specific modem or group of modems, depending on the optional arguments or keywords you use. If you enter the command with the optional *slot/port* specified, only the event log for the modem residing in that slot/port will be cleared. If you enter this command with the optional *modem-group* specified, event logs for all modems associated with that modem group will be cleared. If you enter the **clear modem log** command without specifying an optional keyword or argument, the event logs for all modems in the access server are cleared.

Examples

The following example clears the event log for the MICA modem located in slot 1/port 1 on the Cisco 3640:

```
clear modem log 1/1
```

Related Commands

clear modem
clear modem counters
clear modem group

isdn incoming-voice

To route all incoming voice calls to the modem and treat them as analog data, use the **isdn incoming-voice** interface configuration command. Use the **no** form of this command to disable this feature.

```
isdn incoming-voice {data [56 | 64] | modem [56 | 64]}
no isdn incoming-voice {data [56 | 64] | modem [56 | 64]}
```

Syntax Description

data	Specifies that incoming voice calls will bypass the modems and be handled as digital data.
modem	Specifies that incoming voice calls will be passed over to the digital modems where they will negotiate the appropriate modem connection with the far end modem.
56	Specifies that the bandwidth for this ISDN B-channel is 56 kilobits per second (kbps).
64	Specifies that the bandwidth for this ISDN B-channel is 64 kbps. If no argument is entered for either the data or modem keywords, the default value is 64.

Default

The default value for this command is **isdn incoming-voice data 64**.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3.

Unless you specify otherwise, all calls received by the router characterized as voice calls are treated as normal ISDN calls—meaning that calls are handled as digital data and not passed over to the modem. Use the **isdn incoming-voice** command with the **modem** keyword to have voice calls routed through the modem (as PCM data) instead of being treated as data.

The default ISDN B-channel bandwidth for either the modem or data keywords is 64.

Examples

The following example routes all incoming voice calls through the modem as analog data and specifies an ISDN B-channel bandwidth of 64 kbps:

```
interface Serial3/0:23
 isdn incoming-voice modem
```

Related Commands

None

modem bad

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

modem bad
no modem bad

Syntax Description

This command has no keywords or arguments.

Default

Disabled

Command Mode

Line configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

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

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

Example

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

```
router# test modem back-to-back 2/1 2/0
Repetitions (of 10-byte packets) [1]: 10
router#
%MODEM-5-B2BCONNECT: Modems (2/1) and (2/0) connected in back-to-back test: CONN
ECT9600/REL-MNP
%MODEM-5-B2BMODEMS: Modems (2/0) and (2/1) completed back-to-back test: success/
packets = 20/20
router# test modem back-to-back 2/1 2/3
Repetitions (of 10-byte packets) [1]: 10
router#
%MODEM-5-BADMODEMS: Modems (2/3) and (2/1) failed back-to-back test: NOCARRIER
router# configure terminal
router(config)# line 28
```

```
router(config-line)# modem bad  
router(config-line)# end
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

modem startup-test

show modem

test modem back-to-back

modem buffer-size

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

modem buffer-size *number*

Syntax Description

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

Default

100 modem events

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

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

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

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

Example

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

```
modem buffer-size 150
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

show modem log

modem country mica

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

```
modem country mica country  
no modem country mica country
```

Syntax Description

country Specifies a type of country code. Replace the argument *country* with one of the following supported country names:

- **australia**
- **austria**
- **belgium**
- **china**
- **cyprus**
- **czech-republic** (Czech/Slovak Republic)
- **denmark**
- **e1-default** (Default E1, uses A-law PCM encoding)
- **finland**
- **france**
- **germany**
- **hong-kong**
- **india**
- **ireland**
- **israel**
- **italy**
- **japan**
- **malaysia**
- **netherlands**
- **new-zealand**

- **norway**
- **poland**
- **portugal**
- **russia**
- **singapore**
- **south-africa**
- **spain**
- **sweden**
- **switzerland**
- **t1-default** (Default T1, uses u-law PCM encoding)
- **taiwan**
- **thailand**
- **turkey**
- **united-kingdom**
- **usa**

Default

The default for this command is automatically set by the system, depending on the installed interface. If the platform contains a T1 interface, **t1-default** is assumed. If the platform contains an E1 interface, **e1 default** is assumed.

Note The default setting is not added to the running configuration.

Command Mode

Global configuration

Usage Guideline

This command first appeared in Cisco IOS Release 11.2 P.

Example

The following example selects the country code for the United States as the country code for the Cisco 3640 MICA modems:

```
modem country mica usa
```

Related Commands

None

modem shutdown

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

modem shutdown
no modem shutdown

Syntax Description

This command has no keywords or arguments.

Default

Disabled

Command Mode

Line configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

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

Example

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

```
configure terminal
line 2
modem shutdown
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

modem busyout

show controllers async

To display Universal Asynchronous Receiver/Transmitter (UART) information specific to the Digital Modem Network Module (Cisco 3600 series routers), use the **show controllers async** Privileged EXEC command.

show controllers async

Syntax Description

This command has no keywords or arguments.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)T.

The information displayed by this command is generally useful for diagnostic tasks performed by technical support personnel only.

Sample Displays

The following example uses the **show controllers async** command to display UART information for a Cisco 3640:

```
router#show controllers async
Hex Modem Module Async Interface 65 on Slot 2/Port 0
IDB 0x60CB2890 Context 0x60CB275C
Async Mode Raw
Interface disabled
Buffer information:
Rx Int 0x744
Tx Int 0x73E
Rx Ring: head 0x0 tail 0x0 in ring 0x2
Rx Raw Free Pak Queue: head 0x0 tail 0x0 count 0x0
RxBuf Outstanding 0x0 Disallowed 0x0 PPP public buffers 0x1
Rx Raw Data Queue: head 0x60CB213C tail 0x60CB213C count 0x0
Rx TTY ring throttled 0x16F141
Tx Ring: head 0xE tail 0xE in ring 0x0
Out Pak 0x0 Particle Pak 0x0 count 0x0
Tx Raw Pak Queue: head 0x60CB12C8 tail 0x60CB14BC count 0x2
Tx Busy 0x0
```

Related Commands

show interfaces async

show interfaces async

To display information about the asynchronous interfaces, use the **show interfaces async** Privileged EXEC command.

```
show interfaces async interface-number
```

Syntax Description

interface-number Identifies the asynchronous interface. Valid entries are from 1 to 129.

Command Mode

Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)T.

Each digital modem is given a fixed, linear asynchronous identifier. The mapping between modem slot/port and asynchronous interface-number is given by multiplying the slot number by 32, adding the part number and then adding 1.

Sample Displays

The following example uses the **show interfaces async** command to display information for asynchronous interface 71:

```
router#show interfaces async 71
Async71 is up, line protocol is up
modem(slot/port):2/6, csm_state:CONNECTED_STATE,
bchan_num:4 csm_status: CALL_ACTIVE

Hardware is HMM Async Interface
Interface is unnumbered. Using address of Loopback0 (171.69.167.81)
MTU 1500 bytes, BW 115 Kbit, DLY 100000 usec, rely 255/255, load 1/255
Encapsulation PPP, loopback not set, keepalive not set
DTR is pulsed for 5 seconds on reset
LCP Open
Open: IPCP
Last input 00:03:22, output 00:07:37, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 329
Queueing strategy: weighted fair
Output queue: 0/1000/329 (size/max total/drops)
Conversations 0/4/64 (active/max active/threshold)
Reserved Conversations 0/0 (allocated/max allocated)
30 second input rate 0 bits/sec, 0 packets/sec
30 second output rate 0 bits/sec, 0 packets/sec
9441 packets input, 681811 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
1 input errors, 1 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
10539 packets output, 3095871 bytes, 0 underruns
0 output errors, 0 collisions, 4 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
```

Table 2 describes the fields in the previous display.

Table 2 Show Interfaces Async Field Description

Field	Description
Async	Identifier and state of the async interface.
line protocol	Describes current state of the line protocol.
modem(slot/port):	Slot/port location of the modem fixed to this async interface.
csm_state:	State of the modem as viewed by CSM (call switching module).
bchan_num:	ISDN B channel used by this interface.
csm_status:	Status of the modem as viewed by CSM.
Hardware	Type of interface.
Interface	Interface number and any associated addressing information.
MTU	Maximum transmission unit for packets on this interface.
BW	Bandwidth of the async interface in kilobits per second.
DLY	Delay of the async interface in microseconds.
rely	Reliability of the async interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over five minutes.
load	Load on the async interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over five minutes.
Encapsulation	Encapsulation method used on this interface.
loopback	Test in which signals are sent and then directed back toward the source at some point along the communication path. Used to test network interface usability.
keepalive	Interval set for keepalive packets on the interface.
DTR	Data Terminal Ready. An RS-232-C circuit that is activated to let the DCE know when the DTE is ready to send and receive data.
LCP open closed req sent	Link control protocol (for PPP only). LCP must come to the open state before any useful traffic can cross the link.
Open IPCP IPXCP ATCP	IPCP is IP control protocol for PPP, IPXCP is IPX control protocol for PPP, ATCP is AppleTalk control protocol for PPP. Network control protocols (NCPs) for the PPP suite. The NCP is negotiated after the LCP opens. The NCP must come into the open state before useful traffic can cross the link.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an async interface. Useful for knowing when a dead interface failed.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an async interface.
output hang	Number of hours, minutes, and seconds (or never) since the async interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

Table 2 Show Interfaces Async Field Description (Continued)

Field	Description
Last clearing	Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Input queue, drops	Number of packets in input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
Queueing strategy	Type of queueing selected to prioritize network traffic. The options are first-come-first-serve (FCFS) queueing, weighted fair queueing, priority queueing, and custom queueing.
Output queue	Number of packets in output queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
Conversations	Number of weighted fair queueing conversations.
Reserved Conversations	Number of reserved weighted fair queueing conversations. The example shows the number of allocated conversations divided by the number of maximum allocated conversations. In this case, there have been 0 reserved conversations.
30 second input rate, 30 second output rate	Average number of bits and packets transmitted per second in the last 30 seconds.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the async interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
throttles	Number of times the interface has been throttled, indicating that the interface is running out of resources (such as receive buffers) or is generating too many interrupts.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far end device does not match the checksum calculated from data received. On a LAN, this often indicates noise or transmission problems on the LAN interface or the LAN bus. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link, CRCs often indicate noise, gain hits or other transmission problems on the data link.

Table 2 Show Interfaces Async Field Description (Continued)

Field	Description
frame	Number of packets received incorrectly having a CRC error and a non-integer number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
ignored	Number of received packets ignored by the async interface because the interface hardware ran low on internal buffers. These buffers are different from the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on an async interface. This usually indicates a clocking problem between the virtual access interface and the data link equipment.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end communication server's receiver can handle. This might never be reported on some virtual access interfaces.
output errors	Sum of all errors that prevented the final transmission of datagrams out of the async interface being examined. Note that this might not balance with the sum of the enumerated output errors, as some datagrams might have more than one error, and others might have errors that do not fall into any of the tabulated categories.
collisions	Number of packets colliding.
interface resets	Number of times an async interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. This can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of an async interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an async interface is looped back or shut down.
output buffer failures	Number of outgoing packets dropped from the output buffer.
output buffers swapped out	Number of times the output buffer was swapped out.
carrier transitions	Number of times the carrier detect (CD) signal of an async interface has changed state. Indicates modem or line problems if the CD line changes state often. If data carrier detect (DCD) goes down and comes up, the carrier transition counter increments two times.

Related Commands
show controllers async

show modem

To display a high-level performance report for all the modems or a single modem inside an access server or router, use the show modem EXEC command.

show modem [slot/port | group number]

Syntax Description

slot/port (Optional) Specifies the location of a slot and modem port. If this number is not specified, statistics for all connected modems are displayed. Remember to include the forward slash (/) when entering this variable.

group number (Optional) Specifies a modem group to which a specified modem belongs. The group number range is between 1 and 200.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

Sample Displays

The following display shows output information for the **show modem** command:

```
router#show modem
      Mdm  Usage  Inc calls  Out calls  Busied  Failed  No  Succ
      Mdm  Usage  Succ  Fail  Succ  Fail  Out  Dial  Answer  Pct.
* 2/0    67%    0    0    27    1    0    0    0    96%
  2/1    67%    1    0    25    0    0    0    0    100%
  2/2    68%    1    0    25    0    0    0    0    100%
  2/3    64%    3    0    17    2    0    0    0    90%
  2/4    66%    4    0    18    1    0    0    0    95%
  2/5    68%    6    0    21    0    0    0    0    100%
* 2/6    65%    3    0    19    2    0    0    0    91%
  2/7    54%   14    0    8     1    0    0    0    95%
  2/8    57%   15    0    7     0    0    0    0    100%
* 2/9    53%   17    0    5     0    0    0    0    100%
* 2/10   50%   20    0    2     0    0    0    0    100%
  2/11   47%   21    1    0     0    0    0    0    95%
```

Table 3 describes the fields in the previous display.

Table 3 Show Modem Field Descriptions for MICA Modems

Field	Description
Mdm	<p>Slot and modem port number. Also, the following modem states can appear to the left of a slot/modem port number:</p> <ul style="list-style-type: none"> • 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 DSP code, which supports K56flex, is not configured. The modem will revert to transmitting at 33.6 kbps. • D—Modem is currently downloading firmware. • 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 Succ	Number of incoming calls that successfully connected to a modem.
Inc calls Fail	Number of incoming calls that unsuccessfully connected to a modem.
Out calls Succ	Number of outgoing calls that successfully dialed out from an available modem.
Out calls Fail	Number of outgoing calls that 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 display shows output information for the **show modem** command for the modem located in slot 2, port 0:

```
router#show modem 2/0
Mdm Typ      Status      Tx/Rx      G Duration TX  RX  RTS  CTS  DSR  DCD  DTR
2/0  V34bis Conn    33600/31200 1 00:00:44 -  -          x

Modem 2/0 [line 65], Async65, TTY65
MICA-6DM Firmware: CP ver 2017 - 9/29/1997, SP ver 2017 - 9/29/1997.
Modem config: Incoming and Outgoing
Protocol: LAPM, Compression: V42bis
  Last clearing of "show modem" counters: never
    0 incoming completes, 0 incoming failures
    24 outgoing completes, 1 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
    0 TDM errors, 7 speed shifts (up/dn - 3/0), 1 retrains (hi/lo - 0/0)
```

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	3	21	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	21	0
Connection Speeds	33600	34000	36000	38000	40000	42000
# of connections	3	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 4 describes the fields in the previous display.

Table 4 Show Modem Slot/Port Field Descriptions for MICA Modems

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.

Table 4 Show Modem Slot/Port Field Descriptions for MICA Modems (Continued)

Field	Description
Status	<p>Current status of the modem. Possible values include:</p> <p>Conn—Modem is connected to a remote host.</p> <ul style="list-style-type: none"> • 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 of the current call or the last call.
Modem Functions	<p>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 (-).</p> <ul style="list-style-type: none"> • TX—Transmit Data. The DTE transmits data to the DCE. • RX—Receive Data. The DCE receives data from the DTE. • RTS—Request To Send. The DTE signals to the DCE that the DTE accepts data into its buffers. • CTS—Clear To Send. The DCE signals to the DTE that the DCE accepts data into its buffers. • DSR—Data Set Ready. The modem is ready to start communication. • DCD—Data Carrier Detect. The DCE indicates to the DTE that a call is present and established with a remote modem. Dropping the DCD function terminates the session. • DTR—Data Terminal Ready. The DTE indicates to the DCE that it accepts calls.
Modem	Identifies the slot/port and interfaces associated with this modem.
MICA-6DM Firmware	Installed firmware on this modem.
Modem config:	Indicates the type of traffic this modem is configured for: Outgoing, Incoming, or Incoming and Outgoing.

Table 4 Show Modem Slot/Port Field Descriptions for MICA Modems (Continued)

Field	Description
Protocol:	Protocol the modem is running such as Normal, Direct, reliable/MNP4, and reliable/LAPM (Link Access Procedure for Modems).
Compression:	Compression algorithm running on the modem, such as None, V42bis, and MNP5.
Last clearing of “show modem” counters:	<p data-bbox="894 495 1490 583">Last time the modem's counters were cleared using the clear modem counters command. A summary of modem events also appears.</p> <ul data-bbox="894 590 1490 1730" style="list-style-type: none"> <li data-bbox="894 590 1490 716">• Incoming completes and failures—Total number of incoming connection requests that the modem answered and successfully or unsuccessfully connected with the remote DCE. <li data-bbox="894 722 1490 848">• Outgoing completes and failures—Total number of outgoing connection requests that the modem dialed and successfully or unsuccessfully connected with the remote DCE. <li data-bbox="894 854 1490 942">• Failed dial attempts—Number of times the modem attempted to dial out but the call failed to leave the modem. <li data-bbox="894 949 1490 1037">• Ring no answers—Number of times the integrated modem detected ringing but did not answer the incoming call. <li data-bbox="894 1043 1490 1131">• Busyed outs—Number of times the integrated modem was intentionally taken out of service (for example, the modem busyout command was enabled on the modem). <li data-bbox="894 1138 1490 1205">• No dial tones—Number of times the dial-out attempt failed because the modem failed to detect a dial tone. <li data-bbox="894 1211 1490 1278">• Dial timeouts—Number of times the modem has timed out while attempting to dial. <li data-bbox="894 1285 1490 1352">• Watchdog timeouts—Number of times the modem internal watchdog timer has expired. <li data-bbox="894 1358 1490 1425">• No carriers—Number of times the modem disconnected because no carrier was present. <li data-bbox="894 1432 1490 1499">• Link failures—Number of times the modem has detected a link failure. <li data-bbox="894 1505 1490 1530">• Resets—Number of times the modem has been reset. <li data-bbox="894 1537 1490 1604">• recover oob—Number of times the out-of-band feature has been cleared and re-initialized. <li data-bbox="894 1610 1490 1677">• Protocol timeouts and errors—Number of times the modem protocol failed to make a call connection. <li data-bbox="894 1684 1490 1730">• Lost events—Number of incomplete modem events performed by the modem.
TDM errors	Number of times the digital modem network module experiences a TDM error, meaning that some PCM samples were lost and were never delivered to the modem. This may be seen if multiple T1/E1 interfaces are used that do not share the same clock source.

Table 4 Show Modem Slot/Port Field Descriptions for MICA Modems (Continued)

Field	Description
speed shifts	<p>Number of times this modem has recorded a speed shift. A summary of events are</p> <ul style="list-style-type: none"> • up—Number of times the modem shifted to higher speed. • dn—Number of times the modem shifted to a lower speed. <p>It is possible for the modem to enter the speed shift state without actually changing the connect speed.</p>
retrains	<p>Number of times this modem has retrained. A summary of events are:</p> <ul style="list-style-type: none"> • hi—Number of times that the retraining resulted in a higher connect speed. • lo—Number of times the retraining resulted in a lower connect speed.
Transmit Speed Counters Connection Speeds	List of connection speeds that were transmitted by the modem.
# of connections	<p>A complete summary of possible connection speeds and the actual number of connections that occurred at those speeds.</p> <p>Depending on which modem port module and version of software you are running, possible connection speeds range from 75 to 56,000 bps. The number of successful connections are displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps.</p> <pre> Connection Speeds 56000 # of connections 3 </pre>
Receive Speed Counters Connection Speeds	List of connection speeds that were received by the modem.
# of connections	<p>A complete summary of possible connection speeds and the actual number of connections that occurred at those speeds.</p> <p>Depending on which modem port module and version of software you are running, possible connection speeds range from 75 to 56,000 bps. The number of successful connections are displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps.</p> <pre> Connection Speeds 56000 # of connections 3 </pre>

Related Commands

- show modem call-stats**
- show modem configuration**
- show modem connect-speeds**
- show modem csm**
- show modem group**
- show modem log**
- modem operational-status**
- show modem summary**
- show modem version**

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** EXEC command.

```
show modem call-stats [slot]
```

Syntax Description

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

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3.

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 the `lostCarr` error occurred on all the modems in the system, the `lostCarr` error occurred 2% 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.

Sample Displays

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

See Table 5 for descriptions of the fields and end-connection events in the following sample display.

```

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
* 0/1   5   2   2   3   2   1   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
* 0/3   5   2   2   3   2   1   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
* 0/5   5   2   2   3   2   1   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
* 0/7   4   1   2   3   4   3   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
* 0/9   5   2   1   1   1   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
* 0/11  5   2   1   1   2   1   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
* 0/13  5   2   1   1   1   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
* 0/15  5   2   1   1   1   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
* 0/17  5   2   1   1   2   1   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
* 0/19  5   2   1   1   3   2   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
* 0/21  5   2   1   1   1   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
* 0/23  5   2   1   1   2   1   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
* 2/1   5   2   1   1   2   1   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
* 2/3   5   2   1   1   2   1   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
* 2/5   5   2   1   1   2   1   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
* 2/7   5   2   1   1   1   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
* 2/9   4   1   1   1   2   1   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
* 2/11  5   2   1   1   5   4   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
* 2/13  5   2   1   1   1   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
* 2/15  4   1   1   1   3   2   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
* 2/17  5   2   2   3   9   8   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
* 2/19  3   1   1   1   2   1   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
    
```

* 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

Mdm	noCarr		noDitone		busy		abort		dialStrg		autoLgon		dialTout		rmtHgup	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
* 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 5 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 re-established 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 MNP-10 or LAPM in reliable mode.
moduFail	Modulation error. An error was detected at the 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 an 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 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 dialtone. No dial tone was detected after the modem went off-hook.
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	Dialstring 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.

Table 5 Show Modem Call-Stats Field Descriptions (Continued)

Field	Description
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 hangup. 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.

Related Commands

show modem
show modem configuration
show modem connect-speeds
show modem csm
show modem group
show modem log
modem operational-status
show modem summary
show modem version

show modem configuration

To display the current modem configuration if a digital MICA modems, use the **show modem configuration EXEC** command.

show modem configuration {*slot/port*}

Syntax Description

slot/port Specifies the location of a slot and modem port. Remember to include the forward slash (/) when entering this variable.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2P.

The modem operates with a default configuration that is reloaded after every connection. If the command is issued when the modem is disconnected, it will display this default configuration. If issued when a call is active, it will reflect any changes that might have been made through a chat script.

The S-register values can be changed through a chat script by specifying the register number and new value, using the following syntax:

ATS*number*=*value*

The *number* argument defines the S-register number. The *value* argument is the value for the S-register. For example, if you wanted to disable data compression, you would enter **ATS21=0**.

You can obtain similar information to that displayed by the **show modem configuration** command by reverse telneting to the modem and issuing the following AT command: **AT%R**.

Sample Displays

The following example uses the **show modem configuration** command to display the configuration for modem 2/1, which resides in slot 2/1 of a Cisco 3640:

```
router#show modem config 2/1
  S-Reg  Value  Meaning
-----|-----|-----
  S-- = 1      Country Code is Domestic
  S00 = 1      Auto Answer after 1 seconds
  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 = 40     wait up to 40 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 = 8      8 Data Bits
  S13 = 0      No 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 = 1      ARA Error Correction is enabled for answer, not originate
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 = 5      K56Flex 1.1 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 500 ms
S34 = 1000   Fall Forward Timer is 10.0 seconds
S35 = 50     Fall Back Timer is 0.50 seconds
S36 = 20     Terminate timeout is 20 seconds
S37 = 40     Wait 40 seconds for data mode timeout
S38 = 14     1.4 second lost carrier to hang-up delay
S39 = 7      Transmit level setting of -13 dBm
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 = 32000  Minimum PCM connect rate of 32000 bps
S52 = 1      Digital Pad Compensation is enabled

```

Table 6 describes the fields in the previous display.

Table 6 Show Modem Configuration Field Descriptions for MICA Modems

Field	Description
S-Reg	S-Register.
Value	Number identifying the S-Register value.
Meaning	Description of the defined S-Register value.

Related Commands

- show modem**
- show modem call-stats**
- show modem connect-speeds**
- show modem csm**
- show modem group**
- show modem log**
- modem operational-status**
- show modem summary**
- show modem version**

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** EXEC command.

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

Syntax Description

<i>max-speed</i>	(Optional) Maximum speed you want displayed in the shifting speed window. You can specify from 12,000 to 56,000 bps.
<i>slot</i>	(Optional) Specifies the slot number, which limits the display output to a particular range of modems in the system.

Default

The maximum speed displayed is 12,000 bps.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3.

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 see 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 *max-speed* variable also rounds up to the nearest recognizable baud rate by the software, so you do not need to 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 enter the **show modem connect-speeds** *max-speed* command, only nine baud rate columns can be displayed at the same time. Table 7 shows a range of commands that you can issue, one at a time, to see a complete picture of the total possible connection speeds on your access server.

Table 7 Connect Speed Displays for the Show Modem Connect-Speeds Command

Command	Connect Speed Range Displayed
show modem connect-speeds 56000	40,000 to 56,000 bps
show modem connect-speeds 38000	24,000 to 38,000 bps
show modem connect-speeds 21600	2,400 to 21,600 bps
show modem connect-speeds 12000	75 to 1200 bps

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 entered. If you want to create a monthly report of the connection speeds achieved by the modems, enter the **clear modem counters** command at the beginning of the month and enter the **show modem connect-speeds** command at the end of the month.

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

Sample Displays

The following display 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 display 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	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 8 describes the fields in the previous displays.

Table 8 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.
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

- show modem**
- show modem call-stats**
- show modem configuration**
- show modem csm**
- show modem group**
- show modem log**
- modem operational-status**
- show modem summary**
- show modem version**

show modem csm

To display call switch module (CSM) modem information about MICA digital modems, use the **show modem csm** EXEC command.

```
show modem csm [slot/port | group-number]
```

Syntax Description

slot/port Specifies the display for a single modem in a MICA digital modem board.

group-number Displays output for a predefined group of modems. Valid entries are defined groups from 1 to 1002.

Command Mode

User EXEC

Usage Guideline

This command first appeared in Cisco IOS Release 11.3(2)T.

Use the **show modem csm** command to display CSM MICA modem information. If you do not enter the optional slot/port or group-number arguments, CSM modem information for all modems is displayed.

Sample Displays

The following example uses the **show modem csm** command to display CSM information for MICA modem 2/6, which resides in slot 2/6 of a Cisco 3640:

```
router#show modem csm 2/6
Modem 2/6, line 71 (digital)
CSM status(0): CSM_STATUS_UNLOCKED
CSM current state(0x00000000): IDLE_STATE
CSM last event: ASYNC_DTR_UP, cause: 0x0000
wdt timer is not activated
invalid_events 0, wdt_timeouts 0
ic_failure 0, ic_complete 4, oc_failure 0, oc_complete 0
oc_busy 0, remote_link_disc 0, busyout 0, modem_reset 0
call started 2d05h, call ended 2d19h, total modem active time 13:53:01
```

Table 9 describes the fields in the previous display.

Table 9 Show Modem MICA Field Descriptions

Field	Description
Modem	Slot/port of the modem being displayed.
line	Corresponding async interface number.
CSM status	Status of modem.
CSM current state	State of modem.
CSM last event	Last event received.

Table 9 Show Modem MICA Field Descriptions (Continued)

Field	Description
wdt timer	Indicates whether or not the watchdog timer is running.
invalid events:	Number of unexpected events received by CSM.
wdt timeouts:	Number of watchdog timeouts that have occurred.
ic_failure	Number of incoming call failures.
ic_complete	Number of incoming call completions.
oc_failure	Number of outgoing call failures.
oc_complete	Number of outgoing call completions.
oc_busy	Number of outgoing calls that reached a busy signal.
remote_link_disc	Number of disconnections initiated from the remote end.
busyout	Number of times the modem has been configured for busyout.
modem_reset	Number of times the modem has been reset.
call started	Time when the last call started.
call ended	Time when the last call ended.
total modem active time	Total amount of time the modem has been active across all calls.

Related Commands

- show modem**
- show modem call-stats**
- show modem configuration**
- show modem group**
- show modem log**
- modem operational-status**
- show modem summary**
- show modem version**

show modem group

To display call summary information for MICA digital modems associated with a modem group (and which modems are associated with that group), use the **show modem group EXEC** command.

```
show modem group [number]
```

Syntax Description

number (Optional) Specifies the identifying number for the modem group. Valid entries are from 1 to 1002.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)T.

This command displays call summary information about the modems associated with the specific modem group and lists which modems are members of that group. If a modem group number is specified, the system displays detailed call information normally displayed by the **show modem** command, in addition to the summary information. If a group number is not specified, call summary statistics for each defined modem group is displayed.

Sample Displays

The following example uses the **show modem group** command to display call summary information for each defined group.

```
router#show modem group
          Incoming calls   Outgoing calls   Busied   Failed   No   Succ
Grp  Usage  Succ  Fail  Avail Succ  Fail  Avail  Out   Dial   Ans  Pct.
  1    7%   46    1    11    0    0    11    0     0     0   97%

Modem Group 1: 2/0, 2/1, 2/2, 2/3, 2/4, 2/5, 2/6, 2/7, 2/8, 2/9, 2/10, 2/11
```

Table 10 describes the fields in the previous display.

Table 10 Show Modem Group Field Descriptions for MICA Modems

Field	Description
Grp	Group number.
Usage	Average percentage of time that a modem is busy or in use.
Incoming calls Succ	Number of all incoming call completions for all modems in the group.
Incoming calls Fail	Number of all incoming call failures for all modems in the group.
Incoming calls Avail	Number of modems currently available to receive an incoming call.

Table 10 Show Modem Group Field Descriptions for MICA Modems (Continued)

Field	Description
Outgoing calls Succ	Number of all outgoing call completions for all modems in the group.
Outgoing calls Fail	Number of all outgoing call failures for all modems in the group.
Outgoing calls Avail	Number of modems currently available that could place an outgoing call.
Busied Out	Total number of times that the modem has been taken out of service with the modem busyout command.
Failed Dial	Total number of times that a B-channel failed to be established during dial-out.
No Ans	Number of outgoing call failures where the remote end did not respond for all modems in the group.
Succ Pct	Percentage of successful call completion for all modems in the group.
Modem Group	Number designating this modem group.

The following example uses the **show modem group** command to display call summary information for a particular modem group, followed by the detailed **show modem** command call information for each modem in that group. The example output below only shows the information displayed for one modem; when you issue this command, information will be displayed for all modems belonging to the specified modem group.

```

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    6%   62    4    11    1    9    11    0     1    0   82%

Modem Group 1: 2/0, 2/1, 2/2, 2/3, 2/4, 2/5, 2/6, 2/7, 2/8, 2/9, 2/10, 2/11

Mdm  Typ   Status   Tx/Rx   G  Duration  TX  RX  RTS  CTS  DSR  DCD  DTR
2/0  V34bis Idle    28800/26400  1  00:00:16  -  -             x

Modem 2/0 [line 65], Async65, TTY65
MICA-6DM Firmware: CP ver 2218 - 15/7/52768, SP ver 2218 - 2/9/1998.
Modem config: Incoming and Outgoing
Protocol: LAPM, Compression: V42bis

Last clearing of "show modem" counters: never
  5 incoming completes, 0 incoming failures
  0 outgoing completes, 6 outgoing failures
  1 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
  0 TDM errors, 4 speed shifts (up/dn - 4/0), 5 retrains (hi/lo - 1/2)
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           1        0        2        1        1        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          1
Connection Speeds        21600        24000        26400        28800        31200        32000
# of connections          0          0          0          1          0          0
Connection Speeds        33600        34000        36000        38000        40000        42000
# of connections          2          0          0          0          0          1
Connection Speeds        44000        46000        48000        50000        52000        54000
# of connections          0          0          0          0          0          0
Connection Speeds        56000
# of connections          0

```

Table 11 describes the fields in the previous display.

Table 11 Detailed Show Modem Group Field Descriptions for MICA Modems

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	<p>Current status of the modem. Possible values include:</p> <p>Conn—Modem is connected to a remote host.</p> <ul style="list-style-type: none"> • 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 of the current call or the last call.

Table 11 Detailed Show Modem Group Field Descriptions for MICA Modems (Continued)

Field	Description
Modem Functions	<p>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 (-).</p> <ul style="list-style-type: none"> • TX—Transmit Data. The DTE transmits data to the DCE. • RX—Receive Data. The DCE receives data from the DTE. • RTS—Request To Send. The DTE signals to the DCE that the DTE accepts data into its buffers. • CTS—Clear To Send. The DCE signals to the DTE that the DCE accepts data into its buffers. • DSR—Data Set Ready. The modem is ready to start communication. • DCD—Data Carrier Detect. The DCE indicates to the DTE that a call is present and established with a remote modem. Dropping the DCD function terminates the session. • DTR—Data Terminal Ready. The DTE indicates to the DCE that it accepts calls.
Modem	Identifies the slot/port and interfaces associated with this modem.
MICA-6DM Firmware	Installed firmware on this modem.
Modem config:	Indicates the type of traffic this modem is configured for: Outgoing, Incoming, or Incoming and Outgoing.
Protocol:	Protocol the modem is running such as Normal, Direct, reliable/MNP4, and reliable/LAPM (Link Access Procedure for Modems).
Compression:	Compression algorithm running on the modem, such as None, V42bis, and MNP5.

Table 11 Detailed Show Modem Group Field Descriptions for MICA Modems (Continued)

Field	Description
Last clearing of “show modem” counters:	<p>Last time the modem's counters were cleared using the clear modem counters command. A summary of modem events also appears.</p> <ul style="list-style-type: none"> • Incoming completes and failures—Total number of incoming connection requests that the modem answered and successfully or unsuccessfully connected with the remote DCE. • Outgoing completes and failures—Total number of outgoing connection requests that the modem dialed and successfully or unsuccessfully connected with the remote DCE. • 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.
TDM errors	<p>Number of times the digital modem network module experiences a TDM error, meaning that some PCM samples were lost and were never delivered to the modem. This may be seen if multiple T1/E1 interfaces are used that do not share the same clock source.</p>
speed shifts	<p>Number of times this modem has recorded a speed shift. A summary of events are</p> <ul style="list-style-type: none"> • up: Number of times the modem shifted to higher speed. • dn: Number of times the modem shifted to a lower speed. <p>It is possible for the modem to enter the speed shift state without actually changing the connect speed.</p>

Table 11 Detailed Show Modem Group Field Descriptions for MICA Modems (Continued)

Field	Description
retrains	Number of times this modem has retrained. A summary of events are: <ul style="list-style-type: none"> • hi: Number of times that the retraining resulted in a higher connect speed. • lo: Number of times the retraining resulted in a lower connect speed.
Transmit Speed Counters Connection Speeds	List of connection speeds that were transmitted by the modem.
# of connections	A complete summary of possible connection speeds and the actual number of connections that occurred at those speeds. <p>Depending on which modem port module and version of software you are running, possible connection speeds range from 75 to 56,000 bps. The number of successful connections are displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps.</p> <pre style="margin-left: 40px;">Connection Speeds 56000 # of connections 3</pre>
Receive Speed Counters Connection Speeds	List of connection speeds that were received by the modem.
# of connections	A complete summary of possible connection speeds and the actual number of connections that occurred at those speeds. <p>Depending on which modem port module and version of software you are running, possible connection speeds range from 75 to 56,000 bps. The number of successful connections are displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps.</p> <pre style="margin-left: 40px;">Connection Speeds 56000 # of connections 3</pre>

Related Commands

- show modem**
- show modem call-stats**
- show modem configuration**
- show modem csm**
- show modem log**
- show modem operational-status**
- show modem summary**
- show modem version**

show modem log

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

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

Syntax Description

<i>slot/port</i>	(Optional) Specifies the location of a slot and modem port. If this number is not specified, statistics for all connected modems are displayed. Remember to include the forward slash (/) when entering this variable.
group number	(Optional) Specifies the location of a specific group of modems. If this number is not specified, statistics for all modems in the access server are displayed. The group number range is between 1 and 200.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

Sample Display

The following example shows 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 12 describes significant fields in the previous display.

Table 12 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 why the local or remote modem disconnected: <ul style="list-style-type: none"> — 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

modem buffer size
show modem
show modem call-stats
show modem configuration
show modem csm
show modem group
show modem operational-status
show modem summary
show modem version

show modem operational-status

To display the current modem operational status for MICA digital modems, use the **show modem operational-status EXEC** command.

```
show modem operational-status {slot/port}
```

Syntax Description

slot/port Specifies the location of a slot and modem port. Remember to include the forward slash (/) when entering this variable.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2P.

This command displays operational status information about the MICA modems inside this device.

Sample Displays

The following example uses the **show modem operational-status** command to display the operational status for the modem 2/6 in a Cisco 3640. The modem resides in slot 2 and has been assigned to port number 6.

```
router#show modem operational-status 2/6
Dynamic Link info for modem 2/6:
 4 signal quality (range 0-7 or worst-best)
37 dB signal-to-noise ratio -15 dBm rx signal level
 0 Hz phase jitter freq, 0 degrees phase jitter level
-30 dBm far end echo level, 0 degrees phase roll
 7 retrains and/or speed shifts, 4504 ec retransmissions
2408144 chars tx, 616067 chars rx, 0 chars rx bad
 9292 ppp packets tx, 7928 ppp packets rx, 0 ppp packets rx bad
15436 ec packets tx, 27126 ec packets rx, 4633 ec packets rx bad
```

Table 13 describes the fields in the previous display.

Table 13 Show Modem Configuration Field Descriptions for MICA Modems

Field	Description
Dynamic Link info for modem	Describing the information to be displayed about specified modem.
signal quality	Signal quality value, expressed as a value 0 to 7 where 7 is the worst.
signal-to-noise ratio	Signal-to-noise ratio from 0 to 70 in dB steps.
Rx signal level	Receive level from 0 to -128 in dBm steps.
Hz phase jitter freq	Phase jitter frequency +/-32 in 1/8 Hz steps.
degrees phase jitter level	Phase jitter level from 0 to 90 degrees.

Table 13 Show Modem Configuration Field Descriptions for MICA Modems (Continued)

Field	Description
far end echo level	Far end echo level from 0 to 90 in dBm. This is the part of the transmitted analog signal that has bounced off of the remote modem's analog front end.
degree phase roll	Phase roll +/-32 in 1/8 Hz steps.
retrains and/or speed shifts	Count of total retrains.
ec retransmissions	Count of total error correction retransmission that occurred during the duration of the link.
char tx	Number of characters transmitted.
char rx	Number of characters received.
char rx bad	Number of characters received with parity error.
ppp packets tx	Number of PPP packets transmitted.
ppp packets rx	Number of PPP packets received.
ppp packets rx bad	Number of defective PPP packets received.
ec packets tx	Number of error correction frames transmitted.
ec packets rx	Number of error correction frames received.
ec packets rx bad	Total count of the bad or aborted error correction packets.

Related Commands

show modem
show modem call-stats
show modem configuration
show modem csm
show modem group
show modem log
show modem summary
show modem version

show modem summary

To display call summary information for MICA digital modems, use the **show modem summary EXEC** command.

show modem summary

Syntax Description

This command has no arguments or keywords.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.3(2)T.

This command displays a summary of call statistics for all modems in the access server.

Sample Displays

The following example shows the additional information displayed when you enter the **show modem summary** command. The example below only shows the information displayed for one modem; when you issue this command, information will be displayed for all modems in the access server.

```

router#show modem summary
      Incoming calls      Outgoing calls      Busied      Failed      No      Succ
Usage  Succ  Fail  Avail  Succ  Fail  Avail  Out      Dial      Ans      Pct.
   25%  409   10   22   581   19   22     10       2       0     97%

Mdm  Typ   Status   Tx/Rx   G  Duration  TX  RX  RTS  CTS  DSR  DCD  DTR
2/0  V34bis Idle   28800/26400  1  00:00:16  -  -             x

Modem 2/0 [line 65], Async65, TTY65
MICA-6DM Firmware: CP ver 2218 - 15/7/52768, SP ver 2218 - 2/9/1998.
Modem config: Incoming and Outgoing
Protocol: LAPM, Compression: V42bis

Last clearing of "show modem" counters: never
  5 incoming completes, 0 incoming failures
  0 outgoing completes, 6 outgoing failures
  1 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
  0 TDM errors, 4 speed shifts (up/dn - 4/0), 5 retrains (hi/lo - 1/2)
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       1        0        2        1        1        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         1
Connection Speeds      21600    24000   26400   28800   31200   32000
# of connections       0         0         0         1         0         0
Connection Speeds      33600    34000   36000   38000   40000   42000
# of connections       2         0         0         0         0         1
Connection Speeds      44000    46000   48000   50000   52000   54000
# of connections       0         0         0         0         0         0
Connection Speeds      56000
# of connections       0

```

Table 14 describes the fields in the previous display.

Table 14 Show Modem Group Field Descriptions for MICA Modems

Field	Description
Grp	Group number.
Usage	Average percentage of time that a modem is busy or in use.
Incoming calls Succ	Number of all incoming call completions for all modems in the group.
Incoming calls Fail	Number of all incoming call failures for all modems in the group.
Incoming calls Avail	Number of modems currently available to receive an incoming call.
Outgoing calls Succ	Number of all outgoing call completions for all modems in the group.
Outgoing calls Fail	Number of all outgoing call failures for all modems in the group.
Outgoing calls Avail	Number of modems currently available that could place an outgoing call.
Busied Out	Total number of times that the modem has been taken out of service with the modem busyout command.
Failed Dial	Total number of times that a B-channel failed to be established during dial-out.
No Ans	Number of outgoing call failures where the remote end did not respond for all modems in the group.
Succ Pct	Percentage of successful call completion for all modems in the group.
Modem Group	Number designating this modem group.

Table 15 Detailed Show Modem Group Field Descriptions for MICA Modems

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	<p>Current status of the modem. Possible values include:</p> <ul style="list-style-type: none"> • 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 of the current call or the last call.
Modem Functions	<p>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 (-).</p> <ul style="list-style-type: none"> • TX—Transmit Data. The DTE transmits data to the DCE. • RX—Receive Data. The DCE receives data from the DTE. • RTS—Request To Send. The DTE signals to the DCE that the DTE accepts data into its buffers. • CTS—Clear To Send. The DCE signals to the DTE that the DCE accepts data into its buffers. • DSR—Data Set Ready. The modem is ready to start communication. • DCD—Data Carrier Detect. The DCE indicates to the DTE that a call is present and established with a remote modem. Dropping the DCD function terminates the session. • DTR—Data Terminal Ready. The DTE indicates to the DCE that it accepts calls.

Table 15 Detailed Show Modem Group Field Descriptions for MICA Modems (Continued)

Field	Description
Modem	Identifies the slot/port and interfaces associated with this modem.
MICA-6DM Firmware	Installed firmware on this modem.
Modem config:	Indicates the type of traffic this modem is configured for Outgoing, Incoming, or Incoming and Outgoing.
Protocol:	Protocol the modem is running such as Normal, Direct, reliable/MNP4, and reliable/LAPM (Link Access Procedure for Modems).
Compression:	Compression algorithm running on the modem, such as None, V42bis, and MNP5.
Last clearing of “show modem” counters:	<p>Last time the modem's counters were cleared using the clear modem counters command. A summary of modem events also appears.</p> <ul style="list-style-type: none"> • Incoming completes and failures—Total number of incoming connection requests that the modem answered and successfully or unsuccessfully connected with the remote DCE. • Outgoing completes and failures—Total number of outgoing connection requests that the modem dialed and successfully or unsuccessfully connected with the remote DCE. • 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. • Busyed 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.

Table 15 Detailed Show Modem Group Field Descriptions for MICA Modems (Continued)

Field	Description
TDM errors	Number of times the digital modem network module experiences a TDM error, meaning that some PCM samples were lost and were never delivered to the modem. This may be seen if multiple T1/E1 interfaces are used that do not share the same clock source.
speed shifts	Number of times this modem has recorded a speed shift. A summary of events are <ul style="list-style-type: none"> • up—Number of times the modem shifted to higher speed. • dn—Number of times the modem shifted to a lower speed. It is possible for the modem to enter the speed shift state without actually changing the connect speed.
retrains	Number of times this modem has retrained. A summary of events are: <ul style="list-style-type: none"> • hi—Number of times that the retraining resulted in a higher connect speed. • lo—Number of times the retraining resulted in a lower connect speed.
Transmit Speed Counters Connection Speeds	List of connection speeds that were transmitted by the modem.
# 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 bps. The number of successful connections are displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps. <pre>Connection Speeds 56000 # of connections 3</pre>
Receive Speed Counters Connection Speeds	List of connection speeds that were received by the modem.
# 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 bps. The number of successful connections are displayed directly beneath the connection speed identifier. For example, the following output shows that three connections were made at 56 kbps. <pre>Connection Speeds 56000 # of connections 3</pre>

Related Commands

- show modem**
- show modem call-stats**
- show modem configuration**
- show modem csm**
- show modem group**

show modem log
show modem operational-status
show modem summary
show modem version

show modem version

To display version information about the modem firmware, controller and DSP code (for 56K modems only), and boot code, use the show modem version EXEC command:

show modem version

Syntax Description

This command has no arguments or keywords.

Command Mode

User and Privileged EXEC

Usage Guidelines

This command first appeared in Cisco IOS Release 11.2.

This command displays hardware and software information about each digital modem network module. This command is very useful for verifying the version of modem firmware running on the system after a modem firmware upgrade.

Sample Displays

The following example shows information displayed when you issue the **show modem version** command.

```
router#show modem version
Slot 2:MICA-6DM Firmware, Source - slot0:1:c3600-mica.2017
CP ver 2017 - 9/29/1997, CheckSum 84E088C5.
SP ver 2017 - 9/29/1997.
MICA 0: HW Version 1.0, Serial Number 5433187.
MICA 1: HW Version 1.0, Serial Number 5433232.
```

Table 16 describes the fields in the previous display.

Table 16 Show Modem Version Field Descriptions for MICA Modems

Field	Description
Slot number	Slot where the VFC is installed.
Firmware	Name of the portware image currently loaded.
Source	Source of the portware image. Example output shows portware being loaded from the PCMCIA slot 0.
CP ver	Version of Control Processor code included in this portware.
Checksum	Checksum associated with the Control Processor code in this portware.
SP ver	Version of Signal Processor code included in this portware.
MICA	MICA SIMM installed on the network module, including the hardware version and serial number of each SIMM shown.

Related Commands

show modem
show modem call-stats
show modem configuration
show modem csm
show modem group
show modem log
modem operational-status
show modem summary

