Configuring Cisco EHWIC and 880G for 3G (EV-DO Rev A)

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This guide describes how to configure the Evolution-Data Optimized (EVDO) versions of 3G wireless Enhanced High-Speed WAN Interface Cards (EHWICs). The Cisco EHWIC-3G-EVDO-*x* cards — EHWIC-3G-EVDO-B (Bharat), EHWIC-3G-EVDO-S (Sprint), and EHWIC-3G-EVDO-V (Verizon) — are multiband, multiservice WAN cards for use over WCDMA Radio Access Networks (RAN).

This guide also describes the:

- EVDO versions of the Cisco C881G Series Integrated Services Router (ISR): C881G-B-K9, C881G-S-K9, and C881G-V-K9. Each router contains an embedded multiband, multiservice WAN modem for use over WCDMA networks.
- EVDO versions of the Cisco C881GW Series ISRs: C881GW-S-A-K9 and C881GW-V-A-K9. Each fixed-platform router provides support for dual-radio wireless LAN (WLAN) interfaces and 3G modem functionality on dual-core motherboards and contains an embedded multiband, multiservice WAN modem for use over Global System for Mobile Communications (GSM) networks.

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Modular Cisco ISR G2 Support for the EHWIC-3G-EVDO-*x* Cards

The EHWIC-3G-EVDO-*x* cards are supported on the following modular Cisco Integrated Service Routers Generation 2 (ISR G2) family of routers:

- Cisco 1900
- Cisco 2900
- Cisco 3900
- Cisco 3900e

EHWIC-3G-EVDO-*x* Features

The EHWIC-3G-EVDO-*x* cards and C881G-*x*-K routers provide the following functionalities:

- Remote Open Mobile Alliance Device Management (OMA-DM) activation
- 800/1900 MHz for 1xRTT
- 800/1900 MHz for 1xEVDO Revision 0 and Revision A
- Short Message Service (SMS)
- Remotely initiated data callback using SMS
- Global Positioning System (GPS)
- Broadband WAN connectivity using high-speed cellular data technology
- Automatic best-network selection
- Always-on capability
- Multiple antenna and cable options:
  - Diversity antenna
  - Indoor and outdoor external antennas
  - Radio Frequency Ultra-Low Loss (RF-ULL) cables (see Table 6 for details)
- IOS-based Mobile IP including network mobility (NEMO)
- Static and dynamic IP addressing
- Cellular interface based on the asynchronous interface in Cisco IOS software
- Network Address Translation (NAT) and Port Address Translation (PAT) support
- Security features such as firewall, intrusion-detection systems (IDS), and intrusion-prevention systems (IPS)

- Support for enhanced security features, such as GET VPN, EZ VPN, DMVPN, Multi-point GRE (mGRE), and IPSec VPN
- Auto-detecting optimized WAN switchover
- Support for Hot Standby Router Protocol (HSRP) and Virtual Router Redundancy Protocol (VRRP)
- 3G cellular WAN MIB
  - 3G WWAN MIB persistence
  - MIBs for GPS SMS
- Diagnostic and monitoring (DM) capability
- Remote DM logging over IP
- Voice-initiated data callback
- Cellular modem upgrade over wireless link
- Complete Cisco IOS feature capability
- Modem management — You can access modem software and hardware information, radio and network status, and data profile information using Cisco IOS commands.
- Dial on Demand Routing (DDR) — This allows you to set up a data call when there is data traffic to be sent over the wireless network.
- Fallback connection (DDR backup) — 3G WAN for fixed and modular routers allows you to configure the cellular modem to initiate a dialup connection when connection to a primary service is lost.
- Teardown after fallback (part of fallback DDR) — After a primary connection has failed and the cellular connection is in fallback mode, the 3G feature in fixed and modular routers tears down the fallback-mode connection when the primary connection is available.
- Automatic teardown—After a configurable timeout, the 3G WAN for fixed and modular routers automatically tears down a connection if there has been no activity.
- Autodetect—3G WAN for fixed and modular routers automatically detects and uses the best available service.
- Mobile IP (MIP) data profile configuration—SKU dependent. You can configure up to 5 profiles on Sprint and Bharat SKUs.
- Firmware upgrade—You can upgrade the firmware on the modem by using Cisco IOS commands.
- Comprehensive Cisco IOS MIB support including Interface (IF) MIBs and Entity MIBs.

Product Descriptions and Supported Frequencies

Table 1 shows the products discussed in this document and the frequencies they support.

Table 1 Product Descriptions and Supported Frequencies

SKU Number	Description	Region	Frequency Bands
EHWIC-3G-EVDO-B	This is a multiband, multiservice WAN card. It works on CDMA based cellular networks in India (Bharat).	India	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A
EHWIC-3G-EVDO-S	This is a multiband, multiservice WAN card. It works on Sprint networks.	United States	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A
EHWIC-3G-EVDO-V	This is a multiband, multiservice WAN card. It works on Verizon networks.	United States	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A
C881G-B-K9	This is a router with an embedded multiband, multiservice WAN modem. It works on Bharat networks.	India	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A
C881G-S-K9	This is a router with an embedded multiband, multiservice WAN modem. It works on Sprint networks.	United States	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A
C881G-V-K9	This is a router with an embedded multiband, multiservice WAN modem. It works on Verizon networks.	United States	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A

Table 1 Product Descriptions and Supported Frequencies (continued)

SKU Number	Description	Region	Frequency Bands
C881GW-S-A-K9	This is a router with an embedded multiband, multiservice WAN modem for use over GSM networks. It works on Sprint networks.	United States	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A
C881GW-V-A-K9	This is a router with an embedded multiband, multiservice WAN modem for use over GSM networks. It works on Verizon networks.	United States	800/1900 MHz for 1xRTT 800/1900 MHz for 1xEVDO Revision 0 and Revision A

New Features in the EVDO Versions of the EHWIC 3G Cards and C880 Series ISRs

The following are the new features available in EHWIC-3G-EVDO-*x* cards, C881G-B/S/V-K9 ISRs, and C881GW-S/V-A-K9 ISRs:

- GPS, page 6
- SMS, page 8
- Remotely Initiated Data Callback Using SMS, page 9
- 3G WWAN MIB Persistence, page 10

GPS

The GPS feature provides the following commands:

Command	Syntax	Description
cdma gps mode	**cdma gps mode standalone**	Enables the GPS standalone mode.
cdma gps nmea	**cdma gps nmea**	Enables the NMEA mode.
show cellular gps	**show cellular** *unit* **gps**	Displays a summary of GPS data.
	show cellular *unit* **gps detail**	Displays a detailed list of GPS data.

In the syntax of these commands, the *unit* parameter refers to:

- (EHWIC-3G-EVDO-*x*) The router slot, WAN interface card (WIC) slot, and port separated by slashes (for example, 0/1/0).
- (C880G) The number 0.

These examples show how to enable GPS standalone and NMEA for EHWIC-3G-EVDO-*x*:

```
router(config)#controller cellular 0/0
router(config-controller)#cdma gps mode standalone
...
controller Cellular 0/0
 cdma gps mode standalone

router(config-controller)#cdma gps nmea
...
controller Cellular 0/0
 cdma gps mode standalone
 cdma gps nmea
!
```

These examples show how to display summary and detailed GPS data for C881G-*x*-K9:

```
router#show cellular 0 gps
GPS Info
-------------
GPS State: GPS enabled
GPS Mode Configured: standalone
Latitude: 37 Deg 24 Min 59 Sec North
Longitude: 121 Deg 55 Min 8 Sec West
Timestamp (GMT): Thu Jul 29 11:08:39 2010
Fix type: 3D, Height: -6 m
Heading: 408, Velocity Horiz: 3, Velocity Vert: 0
Satellite Info
----------------
Satellite #13, elevation 75, azimuth 46, SNR 21
...

router#show cellular 0 gps detail
GPS Info
-------------
GPS State: GPS enabled
GPS Mode Configured: standalone
Latitude: 37 Deg 24 Min 59 Sec North
Longitude: 121 Deg 55 Min 7 Sec West
Timestamp (GMT): Thu Jul 29 22:17:57 2010
Fix type: 3D, Height: 12 m
Heading: 0, Velocity Horiz: 0, Velocity Vert: 0
...
```

Note Obtaining a GPS-fixed location requires a supported GPS antenna to be connected to the DIV/GPS port.

Note Obtaining a GPS-fixed location using the Standalone mode can take up to 12 minutes. This depends on the location and type of antenna used.

SMS

This feature enables the router to send and receive SMS messages. This feature also enables the router to save and store the SMS messages on an FTP server.

Note SMS is enabled by default. However, you need to define the FTP server to store incoming and outgoing SMS messages.

The SMS feature provides the following commands:

Command	Syntax	Description
cellular cdma sms send	**cellular** *unit* **cdma sms send** *telNum message*	Sends SMS messages (up to 160 characters per message).
cellular cdma profile select	**cellular** *unit* **cdma sms delete {all |** *msg_ID*}**	Deletes SMS messages.
cellular cdma sms view	**cellular** *unit* **cdma sms view {summary | all |** *msg_ID*}**	Displays SMS messages.
cdma sms archive path	**cdma sms archive path ftp:***path_to_FTP_server*	Saves SMS messages on an FTP server.

In the syntax of these commands, the *unit* parameter refers to:

- (EHWIC-3G-EVDO-*x*) The router slot, WIC slot, and port separated by slashes (for example, 0/1/0).
- (C880G) The number 0.

Note You can use the call screening command **dialer caller** *number* **callback** to authenticate SMS messages that you can use to establish data connections.

This example shows you how to send an SMS message (C881G-*x*-K9):

```
router#cellular 0 cdma sms send <phone number> "Test message"
```

This example deletes all SMS messages (EHWIC-3G-EVDO-*x*):

```
router#cellular 0/1/0 cdma sms delete all
```

This example shows you how to display a summary of SMS messages (EHWIC-3G-EVDO-*x*):

```
router#cellular 0/1/0 cdma sms view summary
ID    FROM                  YY/MM/DD HR:MN:SC  SIZE  CONTENT
0     4087993680            10/05/04 21:29:55  32    from John ...
1     4087993680            10/05/04 21:52:45  32    from Jane ...
2     4087993680            10/05/04 21:56:56  32    from Jake ...
3     4087993680            10/05/04 21:56:58  32    from Tom ...
4     4087993680            10/05/04 21:57:00  32    from Sam ...
```

The following example sets FTP path to the SMS_archive directory on the FTP server at 192.168.1.3 (C881G-*x*-K9 and EHWIC-3G-EVDO-*x*):

```
router(config-controller)# gsm sms archive path
ftp://username:password@192.168.1.3/SMS_archive
```

Remotely Initiated Data Callback Using SMS

This feature remotely brings up the cellular interface by sending SMS messages over CDMA networks.

The following example shows you how to configure this feature for the EHWIC:

```
chat-script cdma "" "atdt#777" TIMEOUT 60 "CONNECT"

interface Loopback1
 ip address 1.1.1.1 255.255.255.0
interface Cellular 0
     ip address negotiated
 ip virtual-reassembly in
 encapsulation ppp
 load-interval 30
 dialer in-band
 dialer pool-member 1
 dialer idle-timeout 0
 no peer default ip address
 async mode interactive
 ppp chap hostname abc.cell.org
 ppp chap password 0 nopassword
 ppp ipcp dns request
 routing dynamic

interface Dialer1
 ip address negotiated
 encapsulation ppp
 dialer pool 1
 dialer idle-timeout 0
 dialer string cdma
 dialer caller 4081234567 callback
 dialer-group 1
 ppp chap hostname abc.cell.org
     ppp chap password 0 nopassword
 ppp ipcp dns request

ip route 0.0.0.0 0.0.0.0 Dialer1
!
access-list 1 permit any
dialer-list 1 protocol ip list 1
!
line 3
 script dialer cdma
 login
 modem InOut
     no exec
     transport input all
     transport output all
```

Note In the example, the phone number of the administrator who wants to remotely bring up the link using SMS is 408-123-4567 on a GSM network (`dialer caller 4081234567 callback`). Replace this number with your own number. To test this example and bring the cellular link up, send an SMS message from your phone.

3G WWAN MIB Persistence

This feature allows you to retain 3G WWAN MIB object values and trap settings across router reloads.

Before configuring 3G WWAN MIB, you should perform some SNMP pre-configuration to avoid getting warning messages. The following is an example of SNMP pre-configuration:

```
snmp-server community public RO
snmp-server community private RW
snmp-server enable traps c3g
```

This example shows you the settings that you need to configure this feature for EHWIC-3G-EVDO-*x*:

```
controller Cellular 0/1
    cdma event rssi onset mib-trap 1xrtt
    cdma event rssi onset mib-trap evdoRel0
    cdma event rssi onset mib-trap evdoRelA
    cdma event rssi onset threshold -84
    cdma event rssi abate mib-trap 1xrtt
    cdma event rssi abate mib-trap evdoRel0
    cdma event rssi abate mib-trap evdoRelA
    cdma event rssi abate threshold -82
    cdma event ecio onset mib-trap 1xrtt
    cdma event ecio onset mib-trap evdoRel0
    cdma event ecio onset mib-trap evdoRelA
    cdma event ecio onset threshold -7
    cdma event ecio abate mib-trap 1xrtt
    cdma event ecio abate mib-trap evdoRel0
    cdma event ecio abate mib-trap evdoRelA
    cdma event ecio abate threshold -5
    cdma event temperature onset mib-trap
    cdma event temperature onset threshold 34
    cdma event temperature abate mib-trap
    cdma event temperature abate threshold 33
    cdma event modem-state mib-trap down
    cdma event modem-state mib-trap up
    cdma event service mib-trap
    cdma event network mib-trap
    cdma event connection-status mib-trap All-cdma
   !
```

Overview of the EHWIC-3G-EVDO Cards

The Evolution-Data Optimized (EVDO) SKUs support the following multiple bands and services:

- 800/1900 MHz for 1xRTT
- 800/1900 MHz for 1xEVDO Revision 0 and Revision A
- Standalone GPS

EHWIC-3G-EVDO-*x* is the Cisco part number for which the interface card is configured and *x* is a variable for carrier-specific versions.

The EHWIC-3G-EVDO versions currently available are:

- EHWIC-3G-EVDO-B (Bharat)
- EHWIC-3G-EVDO-S (Sprint)
- EHWIC-3G-EVDO-V (Verizon)

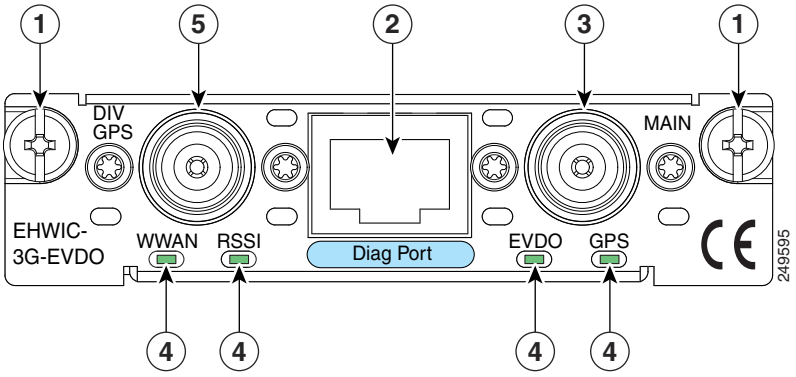
Additional carrier-specific versions may also be available. See the onboard Product ID (PID) sticker to differentiate between released versions.

The EHWIC-3G-EVDO versions support diversity mode (dual antenna mode) in the antennas. Types of antennas include swivel-mounted dipole with extended base and ceiling-mounted antennas. The diversity mode requires two antennas located together and spaced a minimum of 7.5 in. (19 cm) for better RF reception.

Note By default, the diversity mode is enabled. However, it is disabled after GPS is turned on.

Figure 1 shows the front panel view of EHWIC-3G-EVDO.

Figure 1 EHWIC-3G-EVDO Front Panel



1	Mounting Screws	**4**	LEDs
2	Diagnostic Port	**5**	Diversity/GPS Antenna Connector
3	Main Antenna Connector		

Note The diagnostic port is not required for normal activation or operation. For more information, see the "Modem Troubleshooting Using the Diagnostic Port" section on page 133.

Table 2 describes the functions of the LEDs of EHWIC-3G-EVDO. The LEDs provide a visual indication of your available services.

Table 2 EHWIC-3G-EVDO LED Description

LED	Description
WWAN LED Modem status and data transmission	**Off**: EHWIC in reset mode or not powered.
	Slow Green Blink: Searching for service.
	Solid Green: Active service; no traffic detected.
	Fast Green Blink: Active service. Detected traffic is proportional to blink rate.
RSSI LED Received Signal Strength Indicator	**Off**: Low RSSI (under -100 dBm).
	Slow Green Blink: Low or medium RSSI (-99 to -90 dBm).
	Fast Green Blink: Medium RSSI (-89 to -70 dBm).
	Solid Green: High RSSI (-69 dBm or higher).
	Solid Yellow: No service or no RSSI detected.
EVDO LED 3G-EVDO Service Indicator	**Off**: 1xRTT Service
	Green Blink: 1xEVDO Rev 0 Service
	Solid Green: 1xEVDO Rev A Service
GPS LED GPS Acquisition	**Off**: Searching for signal or Disabled.
	Solid Green: Signal found.

For information on how to install the EHWIC-3G-EVDO-*x* card in supported Cisco Access Routers, see *Installing Cisco Interface Cards in Cisco Access Routers*.

For information on how to connect the EHWIC-3G-EVDO-*x* card to your network, see *Connecting Cisco EHWIC-3G-EVDO-x to the Network*.

Overview of the C881G-B/S/V-K9 ISRs

The C881G-B-K9, C881G-S-K9, and C881G-V-K9 ISRs are members of the Cisco 880 series data routers. These routers provide integrated Virtual Private Network (VPN), 802.11b/g/n-compliant wireless Access Point (AP), 3G, and backup capabilities.

For information on configuring Cisco 880 Series ISRs, see *Cisco 880 Series Integrated Services Router Software Configuration Guide*.

C881G-B/S/V-K9 Front and Back Panels

Figure 2 shows the front panel details of the C881G-B/S/V-K9 ISR. The front panel has only LEDs. All the ports are in the back panel.

Figure 2 Front Panel of the C881G-B/S/V-K9

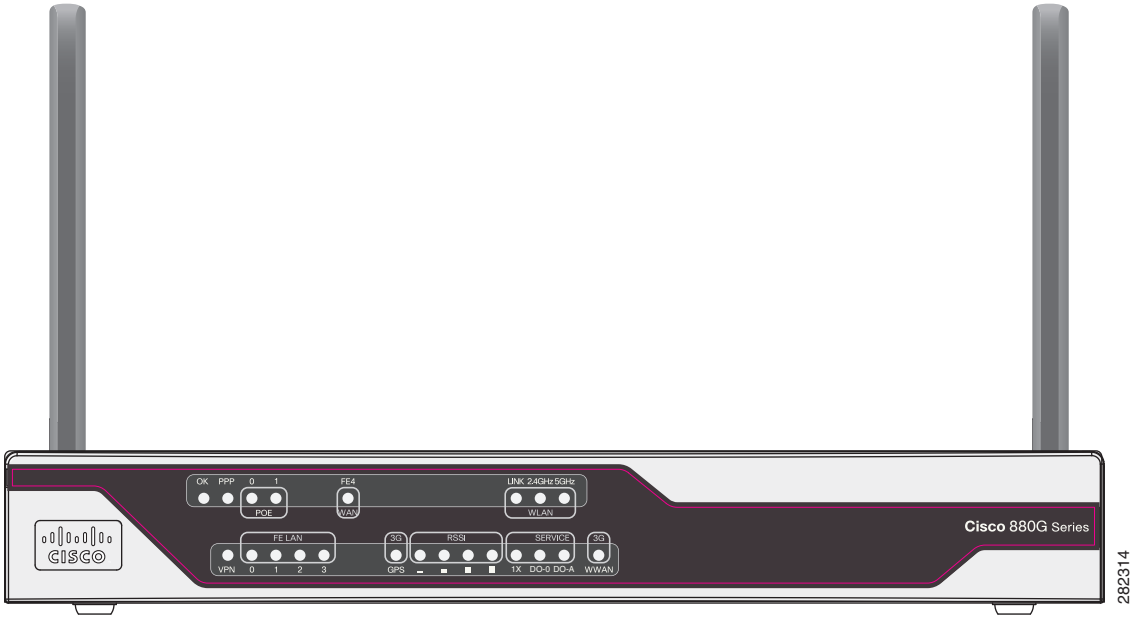


Table 3 describes the LEDs for the C881G-B/S/V-K9 ISR. The LEDs provide a visual indication of the available services.

Table 3 C881G-B/S/V-K9 LED Description

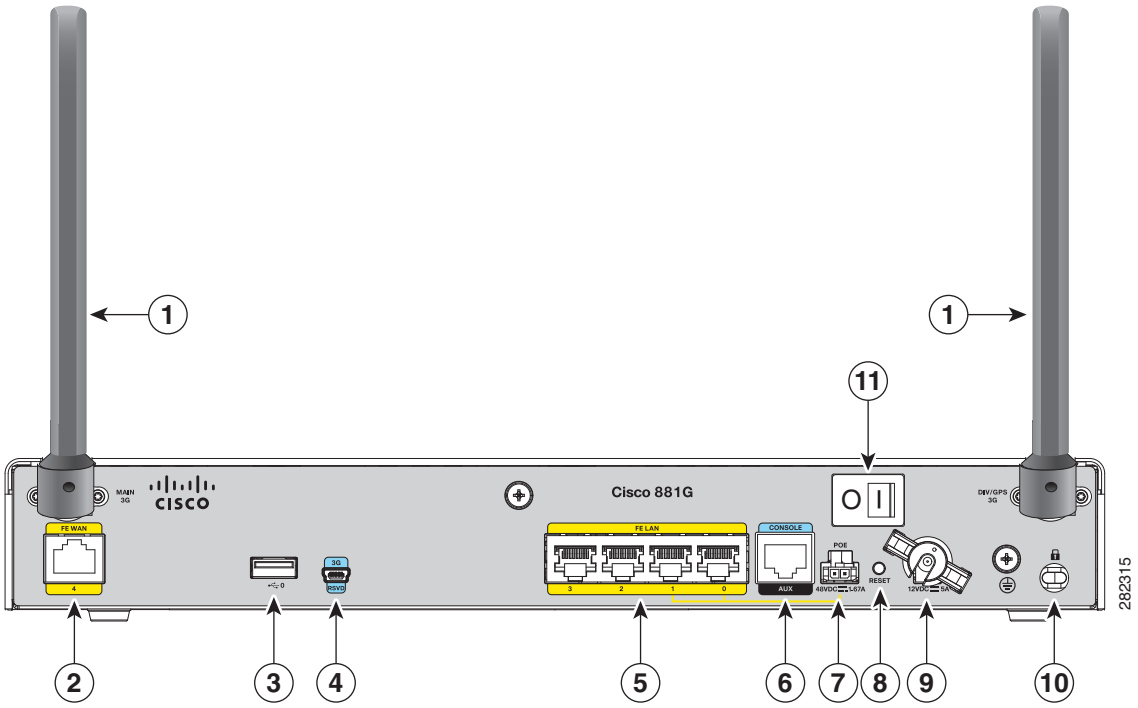
LED	Color	Description
OK (Power)	Green	On—DC power is being supplied to the router and the Cisco IOS software is running. Blinking—Bootup is in process or the router is in ROMMON monitor mode. Off—Power is not supplied to the router.
PPP	Green	On—At least one PPP session is established. Off—No PPP session established.
POE	Green	On—PoE is connected and powered. Off—PoE is not installed.
	Amber	On—Power delivery fault with the PoE.
FE4 (WAN Port)	Green	On—Port is connected. Blinking—Data is either being received or being transmitted. Off—Port is not connected.
WLAN (LINK)	Green	On—Wireless link is up. Blinking—Ethernet link is up, and data is either being received or being transmitted. Off—Wireless link is down.
WLAN (2.4GHz/5GHz)	Green	On—Radio is connected, SSID is configured, and client is associated, but no data is being received or being transmitted. Slow blinking—Radio is connected, SSID is configured, and beacons are being transmitted. Fast blinking—Data is either being received or being transmitted. Off—Radio is shut down, and no SSID is configured.
VPN	Green	Off—VPN is not connected. On—VPN is connected.
FE LAN (FE0:FE3)	Green	On—Ethernet port is connected. Blinking—Data is either being received or being transmitted. Off—Ethernet port is not connected.
GPS (3G)	Green (standalone GPS) Amber (assisted GPS)	Off—GPS not configured. On—GPS configured. Blinking—Acquiring GPS data.

Table 3 C881G-B/S/V-K9 LED Description (continued)

LED	Color	Description
RSSI	Green	RSSI status shown by four LEDs [0:3]. Off [0:3]—Very low signal strength (lower than -110 dBm). On [0], Off [1:3]—Low RSSI (-110 to -90 dBm). On [0:1], Off [2:3]—Medium RSSI (-90 to -75 dBm). On [0:2], Off [3]—High RSSI (-75 to -60 dBm). On [0:3]—Very high RSSI (-60 dBm or higher).
SERVICE	Green/Amber	An array of 3 LEDs [0:2] showing the multiple service levels for each modem type. Only one LED is on at any time; the LED corresponding to the current trained-up service level. When no service can be established the Service[0] LED is illuminated Amber, regardless of signal strength. Service[0]: 1xRTT (1x) Service[1]: EVDO Rev0 (E-0) Service[2]: EVDO RevA (E-A)
WWAN (3G)	Green	Off—Module not powered. On—Module is powered on and connected but not transmitting or receiving. Slow Blinking—Module is powered on and searching for connection. Fast Blinking—Module is transmitting or receiving.

Figure 3 shows the back panel of the C881G-B/S/V-K9.

Figure 3 Back Panel of the C881G-B/S/V-K9



1	Antenna (the antenna on the left is the main antenna and the one on the right is the DIV/GPS antenna)—connectorized wireless WAN (WWAN) omnidirectional dipole antenna (wireless models only)	**7**	PoE power connector—optional
2	Primary WAN port—10/100 FE	**8**	Reset button
3	USB port	**9**	Power connector
4	3G USB diagnostic port	**10**	Kensington security slot
5	4-port 10/100 Ethernet switch	**11**	Power switch
6	Serial port—console or auxiliary		

Installing the C881G-B/S/V-K9 ISR

To install the C881G-B/S/V-K9 ISR, follow the instructions in the *Cisco 860 Series, Cisco 880 Series, and Cisco 890 Series Integrated Services Routers Hardware Installation Guide*. This guide describes the equipment and the procedures for installing the Cisco 860 series, 880 series, and 890 series ISRs.

However, the instructions for connecting the 3G card in the hardware installation guide do not apply to the C881G-B/S/V-K9 ISR because it does not have a slot for adding a 3G card. Instead, a 3G modem is embedded in the router.

Overview of the C881GW-S/V-A-K9 ISRs

The C881GW-S-A-K9 and C881GW-V-A-K9 ISRs are members of the Cisco 880G series data routers. These routers provide integrated VPN, embedded Wi-Fi CERTIFIED™, 802.11b/g/n-compliant wireless AP, 3G, and backup capabilities.

For information on configuring Cisco 880 Series ISRs, see *Cisco 880 Series Integrated Services Router Software Configuration Guide*.

Front and Back Panels

Figure 4 shows the front panel details of the C881GW-S-A-K9 and C881GW-V-A-K9 ISRs. The front panel has LEDs only. All the ports are in the back panel.

Figure 4 Front Panel of the C881GW-S/V-A-K9 ISRs

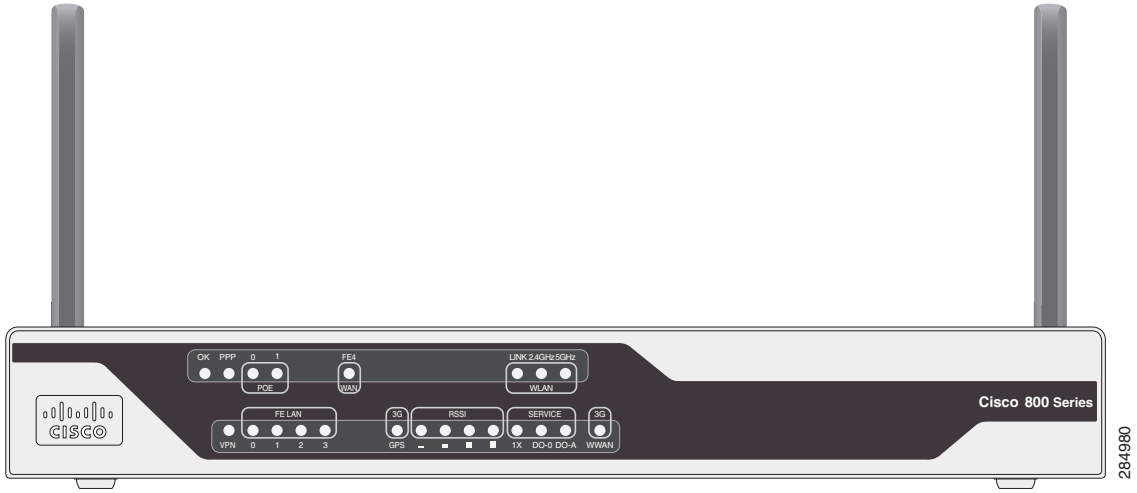


Table 4 describes the LEDs of the C881GW-S-A-K9 and C881GW-V-A-K9 ISRs. The LEDs provide a visual indication of the available services.

Table 4 C881GW-S/V-A-K9 LED Description

LED	Color	Description
OK (Power)	Green	On—DC power is being supplied to the router and the Cisco IOS software is running. Blinking—Bootup is in process or the router is in ROMMON monitor mode. Off—Power is not supplied to the router.
PPP	Green	On—At least one PPP session is established. Off—No PPP session established.

Table 4 C881GW-S/V-A-K9 LED Description (continued)

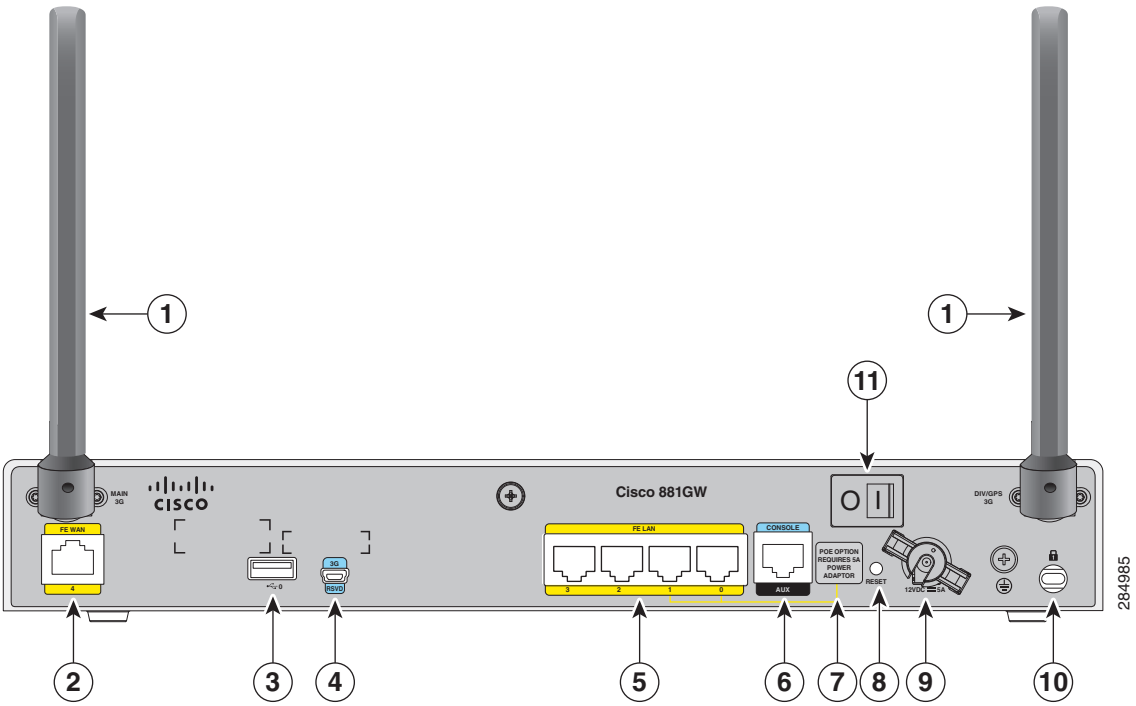
LED	Color	Description
POE	Green	On—PoE is connected and powered. Off—PoE is not installed.
	Amber	On—Power delivery fault with the PoE.
FE4 (WAN Port)	Green	On—Port is connected. Blinking—Data is either being received or being transmitted. Off—Port is not connected.
WLAN (LINK)	Green	On—Wireless link is up. Blinking—Ethernet link is up, and data is either being received or being transmitted. Off—Wireless link is down.
WLAN (2.4GHz/5GHz)	Green	On—Radio is connected, SSID is configured, and client is associated, but no data is being received or being transmitted. Slow blinking—Radio is connected, SSID is configured, and beacons are being transmitted. Fast blinking—Data is either being received or being transmitted. Off—Radio is shut down, and no SSID is configured.
VPN	Green	Off—VPN is not connected. On—VPN is connected.
FE LAN (FE0:FE3)	Green	On—Ethernet port is connected. Blinking—Data is either being received or being transmitted. Off—Ethernet port is not connected.
GPS (3G)	Green (standalone GPS) Amber (assisted GPS)	Off—GPS not configured. On—GPS configured. Blinking—Acquiring GPS data.

Table 4 C881GW-S/V-A-K9 LED Description (continued)

LED	Color	Description
RSSI	Green	RSSI status shown by four LEDs [0:3]. Off [0:3]—Very low signal strength (lower than -110 dBm). On [0], Off [1:3]—Low RSSI (-110 to -90 dBm). On [0:1], Off [2:3]—Medium RSSI (-90 to -75 dBm). On [0:2], Off [3]—High RSSI (-75 to -60 dBm). On [0:3]—Very high RSSI (-60 dBm or higher).
SERVICE	Green/Amber	An array of 3 LEDs [0:2] showing the multiple service levels for each modem type. Only one LED is on at any time; the LED corresponding to the current trained-up service level. When no service can be established the Service[0] LED is illuminated Amber, regardless of signal strength. Service[0]: 1xRTT (1x) Service[1]: EVDO Rev0 (DO-0) Service[2]: EVDO RevA (DO-A)
WWAN (3G)	Green	Off—Module not powered. On—Module is powered on and connected but not transmitting or receiving. Slow Blinking—Module is powered on and searching for connection. Fast Blinking—Module is transmitting or receiving.

Figure 5 shows the back panel details of the C881GW-S-A-K9 and C881GW-V-A-K9 ISRs.

Figure 5 Back Panel of the C881GW-S/V-A-K9 ISRs



1	Antenna (the antenna on the left is the main antenna and the one on the right is the DIV/GPS antenna)—connectorized wireless WAN (WWAN) omnidirectional dipole antenna (wireless models only)	**7**	**Note** No separate PoE power supply is required for routers with embedded WLAN antennas. For information on system power supply requirements when PoE is enabled, see the Power over Ethernet Module section of *Cisco 860 Series, Cisco 880 Series, and Cisco 890 Series Integrated Services Routers Hardware Installation Guide*.
2	Primary WAN port—10/100 FE	**8**	Reset button
3	USB port	**9**	Power connector
4	3G USB diagnostic port	**10**	Kensington security slot
5	4-port 10/100 Ethernet switch	**11**	Power switch
6	Serial port—console or auxiliary		

Installing the C881GW-S/V-A-K9 ISR

To install the C881GW-S-A-K9 and C881GW-V-A-K9 ISRs, follow the instructions in *Cisco 860 Series, Cisco 880 Series, and Cisco 890 Series Integrated Services Routers Hardware Installation Guide*. This guide describes the equipment and the procedures for installing the Cisco 860 series, 880 series, and 890 series ISRs.

However, the instructions for connecting the 3G card in the hardware installation guide do not apply because these ISRs do not have a slot for adding a 3G card. Instead, a 3G modem is embedded in the router.

Supported Cisco Antennas and Cables

Table 5 lists the Cisco antennas that are supported for use with 3G EHWIC cards and C881G ISRs.

Table 5 Supported Cisco Antennas (3G EHWIC cards and C881G ISRs)

Cisco Part Number	Antenna Type	Maximum Gain and Frequency Range	Description
3G-ANTM1916-CM	High-Gain Ceiling-Mount Omnidirectional	1.5 dBi (806–960 MHz) 2.5 dBi (1710–2170 MHz)	Multiband ceiling-mounted omnidirectional antenna. For more information, see *Cisco Multiband In-Building Omnidirectional Ceiling-Mount Antenna (3G-ANTM1916-CM)*.
3G-ANTM1919D	Dipole Omnidirectional	0 dBi (806–960 MHz) 0 dBi (1710–2170 MHz)	This is the default antenna. Multiband dipole antenna. For more information, see *Cisco Multiband Swivel-Mount Dipole Antenna (3G-ANTM1919D)*.
3G-AE015-R (Antenna Extension)	Extension Base	0.8–6.0 GHz	This antenna extension is a base with a 15-foot cable included for use with a dipole omnidirectional antenna. For more information, see *Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (Cisco 3G-AE015-R)*.
3G-AE010-R (Antenna Extension)	Extension Base	0.8–6.0 GHz	This is the default antenna extension. This antenna extension is a base with a 10-foot cable included for use with dipole omnidirectional antennas. For more information, see *Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (Cisco 3G-AE015-R)*. This document applies to both 3G-AE015-R and 3G-AE010-R. The only difference between these two products is the length of the cable.
3G-ANTM-OUT-OM	Outdoor Omnidirectional	+2 dBi 800/900 MHz +4 dBi 1800/1900/2100 MHz	This is an outdoor low-profile omnidirectional mast antenna. For more information, see *Cisco 3G Omnidirectional Outdoor Antenna (3G-ANTM-OUT-OM)*.
3G-ANTM-OUT-LP	Low-Profile Stick Antenna	- 1.5 dBi 850, 900 MHz - 2.5 dBi 1800, 1900, 2100 MHz	This is an omnidirectional stick antenna. For more information, see *Cisco Multiband Omnidirectional Panel-Mount Antenna (3G-ANTM-OUT-LP)*

Table 5 Supported Cisco Antennas (3G EHWIC cards and C881G ISRs) (continued)

Cisco Part Number	Antenna Type	Maximum Gain and Frequency Range	Description
3G-ACC-OUT-LA (Lightning Arrestor)	Lightning Arrestor	800-2200 MHz	This is a quarter-wave lightning protector with integrated high-pass filter. For more information, see *Cisco 3G Lightning Arrestor (3G-ACC-OUT-LA)*
3G-ACC-OUT-COMBO	Lightning Arrestor and Antenna	N/A	Multi-band outdoor omnidirectional antenna mast/wall mount (3G-ACC-OUT-OM) and 3G outdoor antenna lightning arrestor (3G-ACC-OUT-LA)
4G-ANTM-OM-CM	Low-Profile Surface Mount Omnidirectonal	698–2690 MHz	This is a ceiling mount omnidirectional antenna that can be used in any of the 3G or 4G bands (any of the 700/800/900/1700/1800/1900/2100/2600 MHz bands). For more information, see *Cisco 4G Indoor Ceiling-Mount Omnidirectional Antenna (4G-ANTM-OM-CM)*.

Table 6 lists insertion loss information for the ultra-low-loss (ULL) LMR 400 extension cables available from Cisco for use with 3G antennas.

Table 6 Cisco Extension Cables for Use with Antennas

Cisco Product Number	Cable Length	Insertion Loss	Frequency (MHz)
3G-CAB-ULL-20	20 ft (6 m)	1.50 dB max.	2100
3G-CAB-ULL-50	50 ft (15 m)	3.50 dB max.	2100
3G-CAB-LMR240-25	25 ft (7.5 m)	3.50 dB max.	2200
3G-CAB-LMR240-50	50 ft (15 m)	6.90 dB max.	2200
3G-CAB-LMR240-75	75 ft (23 m)	10.5 dB max.	2200

Note You can use the RG-174/U type cables to adapt the modem external antenna connection to any of the EHWIC cables and antennas.

Figure 6 and Figure 7 show some antenna options that can be used with C880G ISRs and routers with 3G EHWIC cards, respectively.

Figure 6 Antenna Options

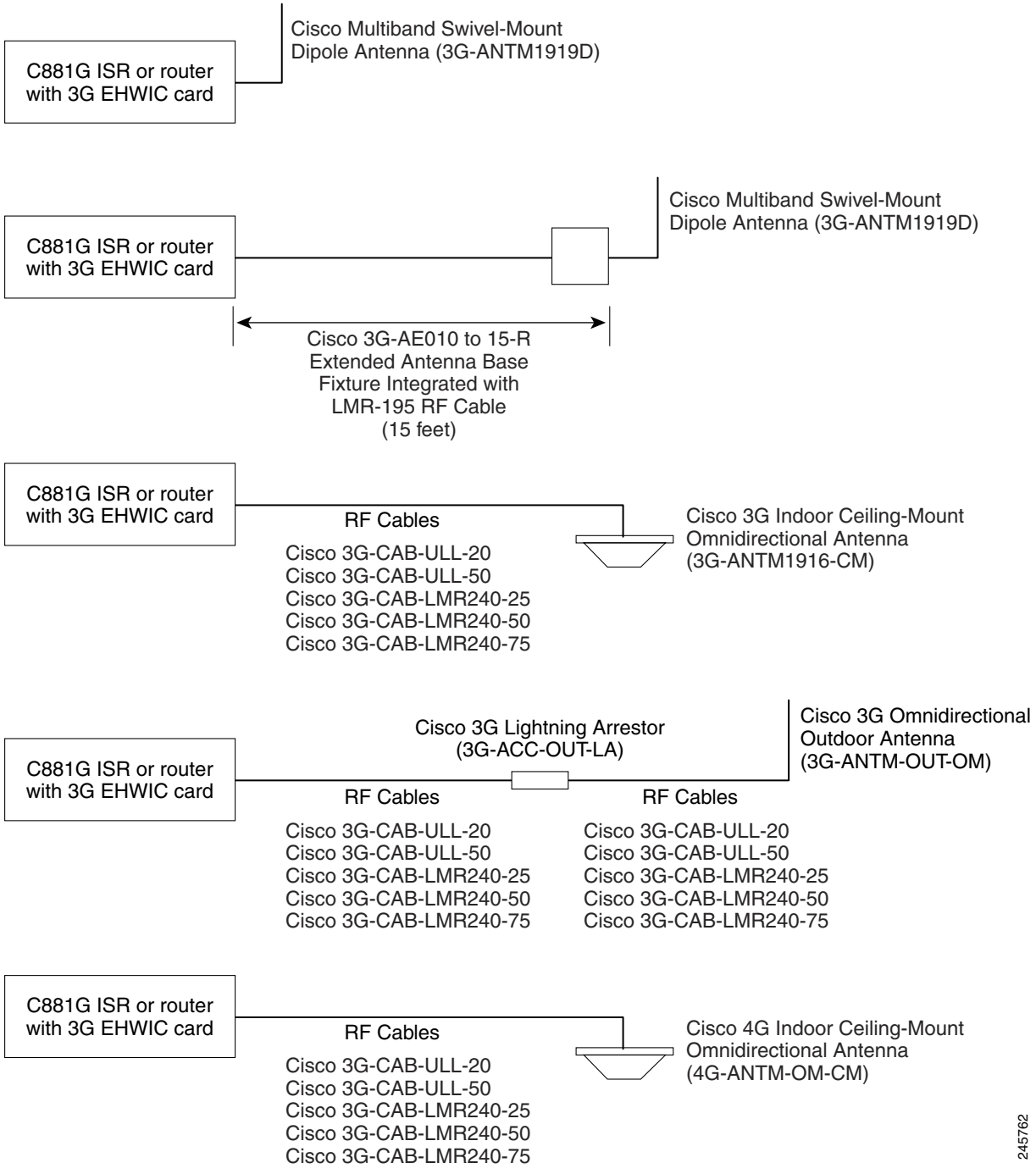
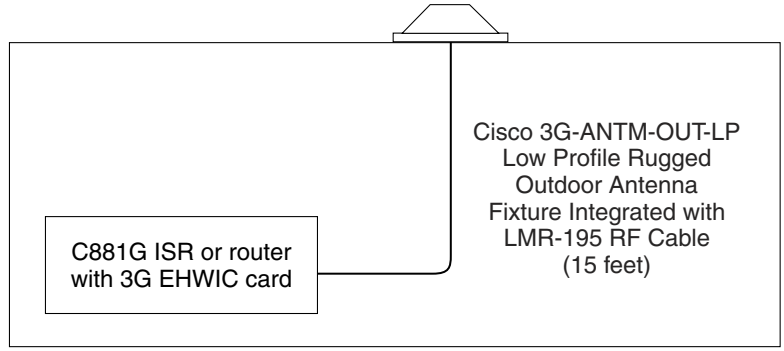
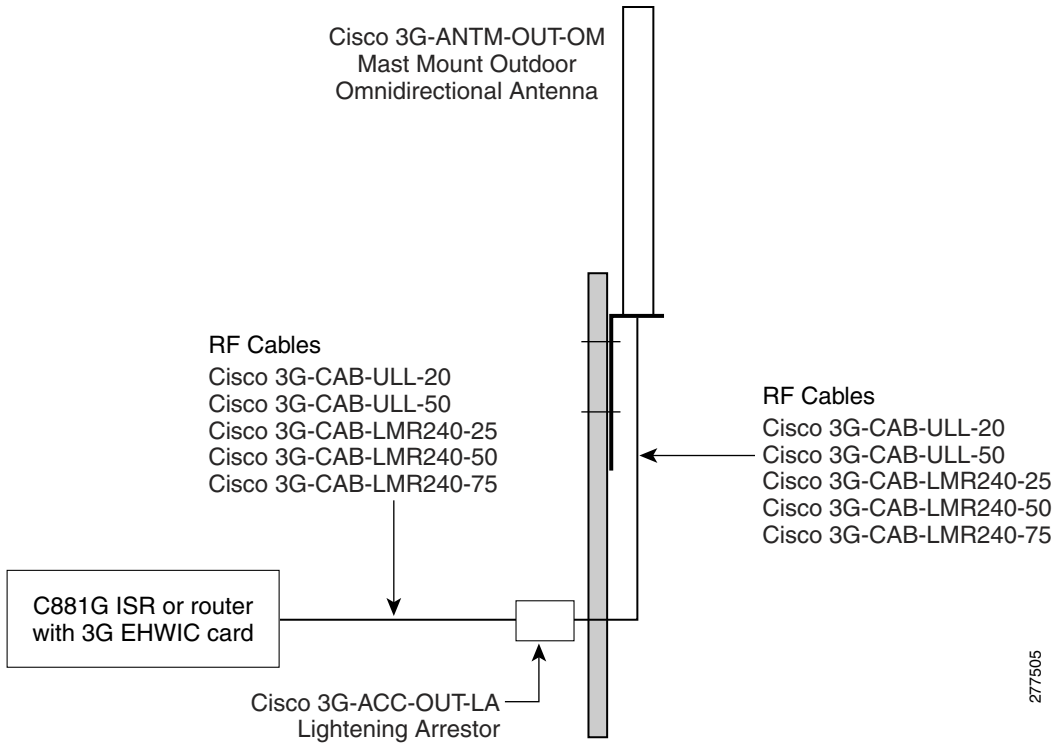


Figure 7 Antenna Options





Configuring EHWIC-3G-EVDO-*x* Cards and C880G-*x*-K9 ISRs

- Overview of SNMP MIBs, page 27
- Configuration Prerequisites and Restrictions, page 32
- Configuring the 3G Wireless Modular and Fixed Cisco ISRs, page 33

Overview of SNMP MIBs

Simple Network Management Protocol (SNMP) development and use is centered around the MIB. An SNMP MIB is an abstract database that is a conceptual specification for information that a management application may read and modify in a certain form. This does not imply that the information is kept in the managed system in that same form. The SNMP agent translates between the internal data structures and formats of the managed system and the external data structures and formats defined for the MIB.

The SNMP MIB is conceptually a tree structure with conceptual tables. Cisco 3G MIB is discussed in more detail in the next section. Relative to this tree structure, the term MIB is used in two senses. In one sense, it is actually a MIB branch, usually containing information for a single aspect of technology, such as a transmission medium or a routing protocol. A MIB used in this sense is more accurately called a MIB module and is usually defined in a single document. In the other sense, a MIB is a collection of such branches. Such a collection might comprise, for example, all the MIB modules implemented by a given agent or the entire collection of MIB modules defined for SNMP.

A MIB is a tree where the leaves are individual items of data called objects. An object may be, for example, a counter or a protocol status. MIB objects are also sometimes called variables.

MIBs can be classified into three categories:

- IF MIBs—Describe interface statistics.
- Cisco-Entity-Vendortype-OID-MIB.my—ENTITY-MIBs are used to provide general hardware type for both the EHWIC and the modem. The CISCO-ENTITY-VENDORTYPE-OID-MIB assigns OIDs for Cisco components (including the HWICs and the modems). The OIDs are then used as the values of entPhysicalVendorType in the ENTITY-MIB.
- Cisco 3G WAN MIBs—Cellular or wireless-specific MIBs.

3G Cellular WAN MIB Architecture

This section describes the MIB definition and implementation support for Cisco's cellular 3G WAN products on the customer premises equipment (CPE) end.

The 3G Cellular WAN MIB supports both CDMA and GSM set of cellular standards and includes the following technologies:

- GSM—GPRS/EDGE/UMTS/HSPA
- CDMA—1xRTT/EVDO RevA/EVDO RevB

The 3G cellular MIB uses indexes from the cellular interface and from the modem. You can obtain the interface index using IF-MIBs and the modem index using the ENTITY MIBs.

The 3G MIB definition includes the following major sub-trees:

- Common objects
- CDMA objects
- GSM objects
- Traps or notifications

You can use MIB object c3gStandard defined in the c3gWanCommonTable to distinguish between CDMA or GSM and implementing MIB for CDMA or GSM.

Note Cisco 3G MIB supports all SNMP versions including V1, V2, V2C, and V3.

At a high-level architecture, the Cisco 3G WAN MIBs are divided into two groups and have the following structure:

1. ciscoWan3gMIBNotifs—Defines all the trap events for Cisco 3G WAN MIBs.
2. ciscoWan3gMIBObjects—Defines all the MIB objects for Cisco 3G WAN MIBs.

ciscoWan3gMIBObjects

The ciscoWan3gMIBObjects group has three sub-groups:

- c3gWanCommonTable—Defines the common MIB objects for both CDMA and GSM.
- c3gWanCdma—Defines the MIB objects specific for a CDMA set of standards (3GPP2).
- c3gWanGsm—Defines the MIB objects specific for a GSM set of standards (3GPP).
- c3gWanLbs—Defines the MIB objects specific for GPS.
- c3gWanSms—Defines the MIB objects specific for SMS.

c3gWanCdma

Under c3gWanCdma, there are seven sub-groups:

- c3gCdmaSessionTable for CDMA session-related objects
- c3gCdmaConnectionTable for CDMA connection-related objects
- c3gCdmaIdentityTable for CDMA user identity-related objects
- c3gCdmaNetworkTable for CDMA network-related objects
- c3gCdmaProfile for CDMA user profile-related objects
- c3gCdmaRadio for CDMA radio-related objects
- c3gCdmaSecurityTable for CDMA security-related objects

c3gWanGsm

Under c3gWANGsm, there are five sub-groups:

- c3gGsmIdentityTable for GSM user identity-related objects
- c3gGsmNetworkTable for GSM network-related objects
- c3gGsmPdpProfile for GSM PDP profile-related objects
- c3gGsmRadio for GSM radio-related objects
- c3gGsmSecurityTable for GSM security-related objects

c3gWanLbs

The following is a list of the MIB objects under c3gWanLbs:

- c3gLbsModeSelected
- c3gLbsState
- c3gLbsLocFixError
- c3gLbsLatitude
- c3gLbsLongitude
- c3gLbsTimeStamp
- c3gLbsLocUncertaintyAngle
- c3gLbsLocUncertaintyA
- c3gLbsLocUncertaintyPos
- c3gLbsFixtype
- c3gLbsHeightValid
- c3gLbsHeight
- c3gLbsLocUncertaintyVertical
- c3gLbsVelocityValid
- c3gLbsHeading
- c3gLbsVelocityHorizontal
- c3gLbsVelocityVertical
- c3gLbsHepe
- c3gLbsNumSatellites
- c3gWanLbsSatelliteNumber
- c3gWanLbsSatelliteElevation
- c3gWanLbsSatelliteAzimuth
- c3gWanLbsSatelliteUsed
- c3gWanLbsSatelliteInfoSignalNoiseRatio
- c3gWanLbsSatelliteInfoRowStatus

c3gWanSms

The following is a list of the MIB objects under c3gWanSms:

- c3gSmsServiceAvailable
- c3gSmsOutSmsCount
- c3gSmsOutSmsErrorCount
- c3gSmsInSmsStorageUsed
- c3gSmsInSmsStorageUnused
- c3gSmsInSmsArchiveCount
- c3gSmsInSmsArchiveErrorCount
- c3gSmsInSmsArchived
- c3gSmsArchiveUrl

- c3gSmsOutSmsStatus
- c3gSmsInSmsCount
- c3gSmsInSmsDeleted
- c3gSmsInSmsStorageMax
- c3gSmsInSmsCallBack
- c3gSmsOutSmsPendingCount
- c3gSmsOutSmsArchiveCount
- c3gSmsOutSmsArchiveErrorCount

ciscoWan3gMIBNotifs

Cisco 3G WAN MIBs implementation supports SNMP GET (read operation) for all MIB objects and SNMP SET (write operation) for the following RW (read-write) objects and more:

- c3gRssiOnsetNotifEnabled
- c3gRssiOnsetNotifThreshold
- c3gRssiAbateNotifEnabled
- c3gRssiAbateNotifThreshold
- c3gEcIoOnsetNotifEnabled
- c3gEcIoOnsetNotifThreshold
- c3gEcIoAbateNotifEnabled
- c3gEcIoAbateNotifThreshold
- c3gModemTemperOnsetNotifEnabled
- c3gModemTemperOnsetNotifThreshold
- c3gModemTemperAbateNotifEnabled
- c3gModemTemperAbateNotifThreshold
- c3gModemReset
- c3gModemUpNotifEnabled
- c3gModemDownNotifEnabled
- c3gServiceChangedNotifEnabled
- c3gNetworkChangedNotifEnabled
- c3gConnectionStatusChangedNotifFlag
- c3gRssiOnsetNotifFlag
- c3gRssiAbateNotifFlag
- c3gEcIoOnsetNotifFlag
- c3gEcIoAbateNotifFlag
- c3gModemTemperOnsetNotifEnabled
- c3gModemTemperAbateNotifEnabled

Note By default, all notifications are disabled. To view notifications, you must enable these notifications.

Note The IF MIBs also have notifications for the cellular interface objects that are used in conjunction with the notification type. When you get a notification, you must check the associated objects.

Table 7 shows various 3G WAN MIB traps and what they mean.

Table 7 3G WAN MIB Traps

3G WAN MIB Traps	Details
c3gModemUpNotif	Modem has successfully been recognized.
c3gModemDownNotif	Crash or power-cycle.
c3gServiceChangedNotif	Service type has changed.
c3gConnectionStatusChangedNotif	Connection status has changed.

Restrictions

- For the router that runs the SNMP agent, you must configure appropriate access control (for example, SNMP-server community) using the Cisco IOS CLI for the NMS and agent to work properly.
- It is strongly recommended that you configure SNMP V3 with authentication/privacy when implementing SNMP SET operation.

Configuration Prerequisites and Restrictions

- Configuration Prerequisites, page 32
- Restrictions for Configuring 3G, page 32

Configuration Prerequisites

The following are prerequisites for configuring EHWIC cards and C880G ISRs:

- You must have service availability on your EHWIC card or C880G ISR from a carrier. In addition, you must have network coverage at your router's location. For a complete list of supported carriers, see the datasheet at

  http://www.cisco.com/go/3g.

- You must subscribe to a service plan with a wireless service provider.
- Before you configure your card, you must install the required antennas. For more information on how to connect antennas to your card, see Table 6.
- You must check your LEDs for signal reception as described in Table 2.
- You should be familiar with the Cisco IOS software, beginning with Release 15.1(3)T or later. (See the Cisco IOS documentation).
- To configure your 3G data profile, you will need the following information from your service provider:
  - Username (if required by your carrier)
  - Password (if required by your carrier)
  - Access Point Name (APN)

Restrictions for Configuring 3G

The following restrictions apply to configuring EHWIC cards and C880G ISRs:

- Data connection—Data connection can be originated only by the 3G EHWIC card.
- Throughput—Due to the shared nature of wireless communications, the experienced throughput varies depending on the number of active users or congestion in a given network.
- Latency—Cellular networks have higher latency compared to wired networks. Latency rates depend on the technology and carrier. Latency may be higher because of network congestion.
- Carrier—Any restrictions that are a part of the terms of service from your carrier.

Configuring the 3G Wireless Modular and Fixed Cisco ISRs

To configure the 3G wireless modular and fixed Cisco ISRs, follow these procedures:

- Modem Activation and Provisioning, page 33
- Data Call Set up, page 37

Note The procedure to configure 3G on both modular and fixed Cisco ISRs is the same except for slot numbering. For example, for 3G EHWIC cards, the numbering for slot 0, wic 0 and port 0 would be 0/0/0 for all commands. For fixed Cisco ISRs, it is only 0. For more information on slot numbering, refer to the relevant modular host documentation for the Cisco 1900 Series, 2900 Series, and 3900 Series ISRs.

Modem Activation and Provisioning

To activate and provision your modem, follow these procedures:

- Verifying Signal Strength and Service Availability, page 33
- Activating the Modem, page 35

Verifying Signal Strength and Service Availability

SUMMARY STEPS

To verify the signal strength and service availability on your modem, use the following commands in EXEC mode.

Note For modem activation, the modem should be attached to a 1xRTT/EVDO service.

1. **show cellular** *unit* **network**
2. **show cellular** *unit* **radio**
3. **show cellular** *unit* **hardware**
4. **show cellular** *unit* **all**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**show cellular** *unit* **network** **Example:** `Router# show cellular 0/0/0 network`	Displays information about the carrier network, cell site, and available service.
Step 2	**show cellular** *unit* **radio** **Example:** `Router# show cellular 0/0/0 radio`	Shows the radio signal strength. **Note** The RSSI should be better than -90 dBm for steady and reliable connection and better than -80 dBm for optimal data throughput.
Step 3	**show cellular** *unit* **hardware** **Example:** `Router# show cellular 0/0/0 hardware`	Shows the hardware details and modem type.
Step 4	**show cellular** *unit* **all** **Example:** `Router# show cellular 0/0/0 all`	Shows consolidated information about the modem, profiles created, radio signal strength, and network security.

Activating the Modem

The activation procedures may differ depending on your carrier. Consult your carrier and follow one of the following procedures:

- Manual Activation, page 35
- Activating Using OMA-DM, page 36
- Activating Using OTASP, page 37

Note Use the **show cellular controller** command to obtain information for the modem type for your modular and fixed Cisco ISRs.

Table 8 lists the activation and provisioning procedures supported by different wireless carriers, depending on the type of MC5728V modem.

Table 8 Support for Activation Procedures by SKUs and Modem Type

	Sprint (-S)	Verizon (-V)	Bharat (-B)
Activation Procedure	**MC5728V**	**MC5728V**	**MC5728V**
Manual Activation using MDN[1]/MSID[2]/MSL[3]	Yes	Yes	Yes
OTASP[4] Activation	No	Yes	Yes
OMA-DM[5] Activation	Yes	No	Yes
IOTA[6] for Data Profile Refresh	No	No	Yes

1. MDN = mobile directory number
2. MSID = mobile subscriber identification number
3. MSL = mobile subscriber lock
4. OTASP= over-the-air service provisioning
5. OMA-DN = Open Mobile Alliance Device Management
6. IOTA = Internet-based over-the-air provisioning

Manual Activation

Note Before you start, you must have valid MDN, MSL, and MSID information from your carrier.

To manually configure a modem profile, use the following command in EXEC mode:

cellular *unit* **cdma activate manual** *mdn msid msl*

For more information about the parameters, see the "cellular cdma activate manual" section on page 74.

In addition to activation, modem data profile provisioning is done using a process called IOTA. IOTA is initiated automatically when you use the **cellular cdma activate manual** command.

The following is a sample output from the **cellular cdma activate manual** command:

```
router# cellular 0/0/0 cdma activate manual 1234567890 1234567890 123456
NAM 0 will be configured and will become Active
Modem will be activated with following Parameters
MDN :1234567890; MSID :1234567890; SID :4183; NID 87:
Checking Current Activation Status
Modem activation status: Not Activated
```

```
Begin Activation
Account activation - Step 1 of 5
Account activation - Step 2 of 5
Account activation - Step 3 of 5
*Jan  1 23:57:41.639: %HWIC_CELL-1-MGMT_ERROR: [Cellular0/0/0] Error response (0x1038)
received from modem (err3:invalid operation type).
Unable to configure MDN
Modem Could not be activated
c3845-1#
*Jan  1 23:57:46.703: %HWIC_CELL-1-MODEM_ACK_FAIL: [Cellular0/0/0] Modem Ack not received.
```

Note The IOTA start and end must have "success" as the resulting output. If you receive an error message, you can run IOTA independently using the **cellular cdma activate iota** command.

Tip A periodic refresh of the data profile may be needed as required by your carrier. Use the following command to refresh the data profile: **cellular cdma activate iota**.

Activating Using OMA-DM

When you power up the modem for the first time, the modem automatically initiates Hands Free Activation (HFA) to receive over-the-air programming for the MDN and MSID numbers and refreshes mobile IP profile1 (MIP1). You will see the message "OMA DM Hands Free Activation session is active" on your device.

At the end of the session, you may see one of the following three messages depending on the activation status:

- If activation is successful: "OMA DM Hands Free Activation completed successfully"
- If activation is unsuccessful, you will see the following message (up to 5 times) indicating that the modem is retrying HFA: "OMA DM Hands Free Activation, waiting for retry in <*n*> seconds".
- If activation is still unsuccessful, user will see the message "OMA DM Hands Free Activation Failed - Error: <*error_code*>(<error_string>). Please try again later. If the problem persists, you may need to contact Customer Service."

To check if the account is provisioned and the modem is activated, use the **show cellular profile** command. If the account is not activated, use the user-initiated mode using the Cisco IOS CLI to activate your modem.

To activate using the Cisco IOS CLI, use the following command in EXEC mode:

cellular *slot/wic/port* **cdma activate oma-dm device-config**

```
Router#cellular 0/0/0 cdma activate oma-dm device-config
Modem is activated
MIP profile 1 will be updated and will be active, if command is successful
Beginning OMA-DM.

Router#
*Feb  5 20:50:18.207: %CELLWAN-2-OMA_DM_ACTIVE: [Cellular0/0/0]: OMA DM Device
Configuration session is active
Enzo-sustaining_1841_Live#
*Feb  5 20:50:34.755: %CELLWAN-2-OMA_DM_SUCCESS: [Cellular0/0/0]: OMA DM Device
Configuration completed successfully
```

Activating Using OTASP

To provision and activate your modem using OTASP, use the following command in EXEC mode:

cellular *slot/wic_slot/port* **cdma activate otasp** *phone_number*

Note You need to obtain the phone number for use with this command from your carrier. The standard OTASP calling number is *22899.

```
router# cellular 0/1/0 cdma activate otasp *22899

Beginning OTASP activation
OTASP number is *22899
router#
*Feb  6 23:18:45.393: OTA State = SPL unlock, Result = Success
*Feb  6 23:19:10.229: OTA State = PRL downloaded, Result = Success
*Feb  6 23:19:11.169: OTA State = Profile downloaded, Result = Success
*Feb  6 23:19:11.173: OTA State = MDN downloaded, Result = Success
*Feb  6 23:19:12.537: OTA State = Parameters committed to NVRAM, Result = Success
*Feb  6 23:19:14.613: Over the air provisioning complete; Result:Success
```

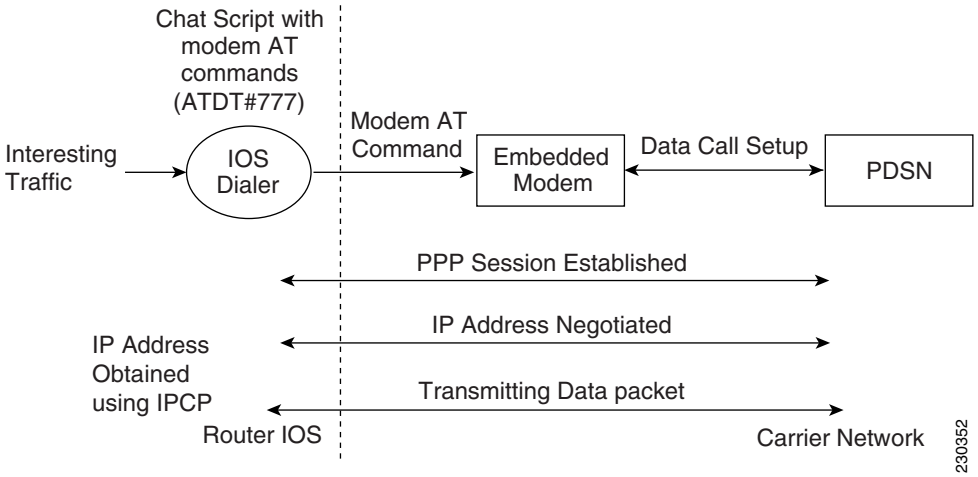
Data Call Set up

To set up a data call, use the following procedures:

- Configuring the Cellular Interface, page 38
- Configuring DDR, page 40
- Configuring DDR Backup, page 42
- Configuring Multiple Mobile IP Profiles, page 47
- Configuring Data Dedicated Transmission Mode (DDTM), page 47

Figure 8 shows a data call setup using the 3G wireless EHWIC.

Figure 8 Data Call Setup with the EHWIC-3G-EVDO



Configuring the Cellular Interface

To configure the cellular interface, perform the following steps.

SUMMARY STEPS

1. **configure terminal**
2. **interface cellular** *unit*
3. **encapsulation ppp**
4. **ppp chap password** *password*
5. **asynchronous mode interactive**
6. **ip address negotiated**

Note The modem supports both mobile IP (MIP) and simple IP (SIP). In both modes, the modem authenticates with the network. However, when the modem is configured in MIP-preferred mode (ask your carrier which mode is supported), if MIP authentication fails, the modem tries to set up a SIP call. The modem uses SIP authentication parameters derived during modem provisioning and passes the CHAP authentication challenge to the cellular interface. The purpose of the authentication challenge is to keep the cellular interface informed of Link Control Protocol (LCP) negotiations between the modem and the network. The authentication challenge from the modem does not have a username, so under the cellular interface, you should configure a default CHAP password; that is, configure only the **ppp chap password** and not the **ppp chap hostname**. If your carrier supports only MIP, you do not need to configure either of the two parameters.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode from the terminal.
Step 2	**interface cellular** *unit* **Example:** `Router(config)# interface cellular 0/0/0`	Specifies the cellular interface.
Step 3	**encapsulation ppp** **Example:** `Router(config-if)# encapsulation ppp`	Specifies PPP encapsulation for an interface configured for dedicated asynchronous mode or dial-on-demand routing (DDR).
Step 4	**ppp chap password** *password* **Example:** `Router(config-if)# ppp chap password cisco`	Defines an interface-specific CHAP password. **Note** You can set the password to any value. This password is used only when the modem has failed MIP authentication and fails over to SIP mode. The modem ignores the CHAP authentication response from the cellular interface.
Step 5	**asynchronous mode interactive** **Example:** `Router(config-if)# asynchronous mode interactive`	Returns a line that has been placed into dedicated asynchronous network mode to interactive mode, enabling the slip and ppp EXEC commands.
Step 6	**ip address negotiated** **Example:** `Router(config-if)# ip address negotiated`	Specifies that the IP address for a particular interface is obtained via PPP/IPCP address negotiation.

Note When static IP address is required for the cellular interface, the address may be configured with **ip address negotiated**. During IPCP, the network ensures that the correct static IP address is allocated to the device. If a tunnel interface is configured with **ip address unnumbered** *cellular interface*, it is necessary to configure the actual static IP address under the cellular interface, in place of **ip address negotiated**. For a sample cellular interface configuration, see the "Example: Basic Cellular Interface Configuration" section on page 48.

Configuring DDR

To configure DDR for the cellular interface, perform the following steps.

SUMMARY STEPS

1. **configure terminal**
2. **interface cellular** *unit*
3. **dialer in-band**
4. **dialer idle-timeout** *seconds*
5. **dialer string** *string*
6. **dialer group** *number*
7. **exit**
8. **dialer-list** *dialer-group* **protocol** *protocol-name* {**permit** | **deny** | **list** *access-list-number* | **access-group**}
9. **ip access-list** *access list number* **permit** *ip source address*
10. **line** *unit*
11. **script dialer** *regexp*
12. **exit**
13. **chat-script** *script name* **"" "ATDT#777" TIMEOUT** *timeout value* **CONNECT**
14. **interface cellular** *unit*
15. **dialer string** *string*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode from the terminal.
Step 2	**interface cellular** *unit* **Example:** `Router(config)# interface cellular 0/0/0`	Specifies the cellular interface.
Step 3	**dialer in-band** **Example:** `Router(config-if)# dialer in-band`	Enables DDR and configures the specified serial interface to use in-band dialing.
Step 4	**dialer idle-timeout** *seconds* **Example:** `Router(config-if)# dialer idle-timeout 30`	Specifies the duration of idle time, in seconds, after which a line will be disconnected.
Step 5	**dialer string** *string* **Example:** `Router(config-if)# dialer string cdma`	Specifies the number or string to dial. Use the name of the CHAT script here.
Step 6	**dialer-group** *number* **Example:** `Router(config-if)# dialer-group 1`	Specifies the number of the dialer access group to which the specific interface belongs.
Step 7	**exit** **Example:** `Router(config-if)# exit`	Enters global configuration mode.
Step 8	**dialer-list** *dialer-group* **protocol** *protocol-name* {**permit** | **deny** | **list** *access-list-number* | **access-group**}> **Example:** `Router(config)# dialer-list 1 protocol ip list 1`	Creates a dialer list for traffic of interest and permits access to an entire protocol.
Step 9	**ip access-list** *access list number* **permit** *ip source address* **Example:** `Router(config)# ip access-list 1 permit any`	Defines traffic of interest.
Step 10	**line** *unit* **Example:** `Router(config)# line 0/0/0`	Specifies the line configuration mode.

	Command or Action	Purpose
Step 11	**script dialer** *regexp* **Example:** `Router(config-line)# script dialer cdma`	Specifies a default modem chat script.
Step 12	**exit** **Example:** `Router(config-line)# exit`	Exits line configuration mode.
Step 13	**chat-script** *script name* **"" "ATDT#777" TIMEOUT** *timeout value* **CONNECT** **Example:** `Router(config)# chat-script cdma "" "ATDT#777" TIMEOUT 60 CONNECT`	Defines the ATDT commands when the dialer is initiated.
Step 14	**interface cellular** *unit* **Example:** `Router(config)# interface cellular 0/1/0`	Specifies the cellular interface.
Step 15	**dialer string** *string* **Example:** `Router(config)# dialer string cdma`	Specifies the dialer script (defined using the **chat script** command).

Configuring DDR Backup

To monitor the primary connection and initiate the backup connection when needed, the router can use one of the following methods:

- Backup Interface—The backup interface that stays in standby mode until the primary interface line protocol is detected as down and then is brought up. See the "Configuring Interfaces to Use a Backup Interface" section on page 43.
- Floating Static Route—The route through the backup interface has an administrative distance that is greater than the administrative distance of the primary connection route and therefore would not be in the routing table until the primary interface goes down. See the "Configuring DDR Backup Using Floating Static Route" section on page 44.
- Dialer Watch—The backup feature that integrates dial backup with routing capabilities. See the "Configuring DDR Backup Using Dialer Watch" section on page 45.

Configuring Interfaces to Use a Backup Interface

To configure one or more interfaces to use a backup interface, perform the following steps.

SUMMARY STEPS

1. **interface** *type number*
2. **backup interface cellular** *number*
3. **backup delay** *enable-delay disable-delay*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**interface** *type number* **Example:** `Router(config)# interface ATM0/0/0`	Specifies the interface to be backed up and begins interface configuration mode.
Step 2	**backup interface cellular** *number* **Example:** `Router(config-if)# backup interface cellular0/3/0`	Specifies the cellular interface as backup.
Step 3	**backup delay** *enable-delay disable-delay* **Example:** `Router(config-if)# backup delay enable-delay`	Specifies delay between the physical interface going down and the backup interface being enabled, and between the physical interface coming back up and the backup being disabled.

Note You cannot configure a backup interface for the cellular interface and any other asynchronous serial interface.

Configuring DDR Backup Using Floating Static Route

To configure a floating static default route on the secondary interface, perform the following steps.

Note Make sure you have ip classless enabled on your router.

SUMMARY STEPS

1. **configure terminal**
2. **ip route** *network-number network-mask* {*ip address* | *interface*} [*administrative distance*] [**name** *name*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode from the terminal.
Step 2	**ip route** *network-number network-mask* {*ip-address* | *interface*} [*administrative distance*] [**name** *name*] **Example:** `Router(config)# ip route 0.0.0.0 Dialer 2 track 234`	Establishes a floating static route with the configured administrative distance through the specified interface. **Note** A high administrative distance should be configured for the route through the backup interface so that it is used only when the primary interface is down.

Configuring DDR Backup Using Dialer Watch

To initiate dialer watch, you must configure the interface to perform DDR and backup. Use traditional DDR configuration commands, such as dialer maps, for DDR capabilities. To enable dialer watch on the backup interface and create a dialer list, perform the following steps.

SUMMARY STEPS

1. **configure terminal**
2. **interface** *type number*
3. **dialer watch group** *group-number*
4. **dialer watch-list** *group-number* **ip** *ip-address address-mask*
5. **dialer-list** *dialer-group* **protocol** *protocol name* {**permit** | **deny** | **list** *access list number* | **access-group**}
6. **ip access-list** *access list number* **permit** *ip source address*
7. **interface cellular** *unit*
8. **dialer-group** *dialer group number*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode from the terminal.
Step 2	**interface** *type number* **Example:** `Router(config)# interface ATM0/0/0`	Specifies the interface.
Step 3	**dialer watch-group** *group-number* **Example:** `Router(config-if)# dialer watch-group 2`	Enables dialer watch on the backup interface.
Step 4	**dialer watch-list** *group-number* **ip** *ip-address address-mask* **Example:** `Router(config-if)# dialer watch-list 2 ip 10.4.0.254 255.255.0.0`	Defines a list of all IP addresses to be watched.
Step 5	**dialer-list** *dialer-group* **protocol** *protocol-name* {**permit** | **deny** | **list** *access-list-number* | **access-group**} **Example:** `Router(config)# dialer-list 2 protocol ip permit`	Creates dialer list for traffic of interest and permits access to an entire protocol.

	Command or Action	Purpose
Step 6	**ip access-list** *access list number* **permit** *ip source address* **Example:** `Router(config)# access list 2 permit 10.4.0.0`	Defines traffic of interest. **Note** Do not use the **access list permit all** command to avoid sending traffic to the IP network. This may result in call termination.
Step 7	**interface cellular** *slot/wic_slot/port* **Example:** `Router(config)# interface cellular 0/1/0`	Enters the interface configuration mode.
Step 8	**dialer-group** *dialer group number* **Example:** `Router(config-if)# dialer-group 2`	Maps a dialer list to the dialer interface.

Configuring Multiple Mobile IP Profiles

This procedure is for the EHWIC-3G-EVDO SKUs only.

Note Please verify with your carrier if mobile IP is supported on your EHWIC.

SUMMARY STEPS

1. **cellular** *unit* **cdma profile configure** *<profile number> <primary home agent address> <secondary home agent address> <mobile home agent address> <NAI> <MN-AAA SS> <MN-HA SS> <MN-AAA SPI> <MN-HA SPI> <rev-tunneling>*
2. **cellular** *unit* **cdma profile select** *profile number*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**cellular** *unit* **cdma profile configure** *<profile number> <primary home agent address> <secondary home agent address> <mobile home agent address> <NAI> <MN-AAA SS> <MN-HA SS> <MN-AAA SPI> <MN-HA SPI> <rev-tunneling>* **Example:** `Router# cellular 0/0/0 cdma profile configure 1 1.1.1.1 2.2.2.2 3.3.3.3 test@xyz.com aaa bbb 1234 1234 1`	Configures data (MIP) profile. **Note** Parameters for this command may be different for different SKUs. For more information, see the "cellular cdma activate oma-dm device config" section on page 76.
Step 2	**cellular** *unit* **cdma profile select** *profile number* **Example:** `Router# cellular 0/0/0 cdma profile select 1`	Sets a profile as the current active profile.

Configuring Data Dedicated Transmission Mode (DDTM)

On CDMA modems, data transmission is disrupted by incoming voice calls if data dedicated transmission mode (DDTM) is disabled. You can enable DDTM mode so the modem will ignore incoming voice calls.

To enable DDTM on a CDMA modem, use the **cdma ddtm** command in controller configuration mode:

```
Router(config)# controller cellular 0
Router(config-controller)# cdma ddtm
```

This command is enabled by default. You can disable this feature using the **no** form of the **cdma ddtm** command:

```
Router(config)# controller cellular 0
Router(config-controller)# no cdma ddtm
```

Note When DDTM is enabled, only voice calls are blocked for the MC5728V modem. SMS messages are not.

Configuration Examples for the 3G Wireless Modular and Fixed Cisco ISRs

This section provides the following configuration examples:

- Example: Basic Cellular Interface Configuration, page 48
- Example: Tunnel over Cellular Interface Configuration, page 48
- Example: 3G Wireless Modem as Backup with NAT and IPSec, page 49
- Example: Voice-Initiated Data Callback, page 51

Example: Basic Cellular Interface Configuration

The following is a sample configuration where the cellular interface is used as a primary and is configured as the default route:

```
chat-script cdma "" "ATDT#777" TIMEOUT 60 "CONNECT"

!
interface Cellular0/0/0
 ip address negotiated
 encapsulation ppp
 dialer in-band
 dialer string cdma
 dialer-group 1
 async mode interactive
 ppp chap password 0 cisco
ppp ipcp dns request
!

!
!
access-list 1 permit any
dialer-list 1 protocol ip list 1
!
line 0/0/0
 exec-timeout 0 0
 script dialer cdma
 login
 modem InOut
```

Example: Tunnel over Cellular Interface Configuration

The following is a sample configuration, showing the static IP address when a tunnel interface is configured using the **ip address unnumbered** *cellular interface* command:

```
interface Tunnel2
 ip unnumbered GigabitEthernet0/1
 tunnel source Cellular0/3/0
 tunnel destination 128.107.248.254

interface Cellular0/3/0
!
 ip address negotiated
```

```
 encapsulation ppp

 dialer in-band
 dialer idle-timeout 0
 dialer string cdma
 dialer-group 1
 async mode interactive

 ppp chap password 0 cisco
 ppp ipcp dns request


! traffic of interest through the tunnel/cellular interface
ip route 10.10.0.0 255.255.0.0 Tunnel2
```

Example: 3G Wireless Modem as Backup with NAT and IPSec

The following is a sample configuration of a 3G wireless modem as backup with NAT and IPSec:

```
ip dhcp excluded-address 10.4.0.254
!
ip dhcp pool cdma-pool
   network 10.4.0.0 255.255.0.0
   default-router 10.4.0.254
!
chat-script cdma "" "atdt#777" TIMEOUT 20 "CONNECT"
!
track 234 rtr 1 reachability
!
crypto isakmp policy 1
 encr 3des
 authentication pre-share
!
crypto isakmp key mykey address 20.20.241.234
!
crypto ipsec transform-set mytransformset ah-sha-hmac esp-3des
!
crypto map vpn1 10 ipsec-isakmp
 set peer 20.20.241.234
 set transform-set mytransformset
 match address 103
!
interface GigabitEthernet0/0
 ip address 10.4.0.254 255.255.0.0
 duplex auto
 speed auto
!
interface ATM0/0/0
 no ip address
 ip virtual-reassembly
 load-interval 30
 no atm ilmi-keepalive
 dsl operating-mode auto
!
interface ATM0/0/0.1 point-to-point
 ip nat outside
 ip virtual-reassembly
 no snmp trap link-status
```

```
 pvc 0/35
  pppoe-client dial-pool-number 2
 !
interface Cellular0/3/0
 ip address negotiated
 ip nat outside
 encapsulation ppp
 dialer in-band
 dialer idle-timeout 0
 dialer string cdma
 dialer-group 1
 ppp chap hostname host@apn
 ppp chap password 0 cisco123
 ppp ipcp dns request
 crypto map vpn1
!
interface Dialer2
 ip address negotiated
 ip nat outside
 encapsulation ppp
 dialer pool 2
 dialer-group 2
 ppp chap hostname cisco@dsl.net
 ppp chap password 0 cisco123
 ppp pap sent-username Cisco@dsl.net password 0 cisco123
 ppp ipcp dns request
 crypto map vpn1
!
ip local policy route-map track-primary-if
!
ip route 0.0.0.0 0.0.0.0 Dialer2 track 234
!
ip route 0.0.0.0 0.0.0.0 Cellular0/3/0 254
!
ip nat inside source route-map nat2cell interface Cellular0/3/0 overload
ip nat inside source route-map nat2dsl interface Dialer2 overload
!
ip sla 1
 icmp-echo 209.131.36.158 source-interface Dialer2
 timeout 1000
 frequency 2
ip sla schedule 1 life forever start-time now
!
access-list 1 permit any
access-list 101 deny ip 10.4.0.0 0.0.255.255 20.20.0.0 0.0.255.255
access-list 101 permit ip 10.4.0.0 0.0.255.255 any
!
access-list 102 permit icmp any host 209.131.36.158
!
access-list 103 permit ip 10.4.0.0 0.0.255.255 20.20.0.0 0.0.255.255
!
dialer-list 1 protocol ip list 1
dialer-list 2 protocol ip permit
!
route-map track-primary-if permit 10
 match ip address 102
 set interface Dialer2 null0
!
route-map nat2dsl permit 10
 match ip address 101
 match interface Dialer2
!
route-map nat2cell permit 10
 match ip address 101
```

```
 match interface Cellular0/3/0
!
event manager applet pri_back
 event track 234 state any
 action 2.0 cli command "clear ip nat trans forced"
!
line 0/3/0
 script dialer cdma
 modem InOut
```

Example: Voice-Initiated Data Callback

The following example shows how to configure voice-initiated data callback on a router:

```
hostname 1900
!
boot-start-marker
boot-end-marker
!
security passwords min-length 1
enable password lab
!
no aaa new-model
service-module wlan-ap 0 bootimage autonomous
!
no ipv6 cef
ip source-route
ip cef

!
!
multilink bundle-name authenticated
!
chat-script cdma "" "atdt#777" TIMEOUT 60 "CONNECT"
!
!
license udi pid CISCO1941-W sn FHH1249P021
!
!
archive
 log config
  hidekeys
!
!
controller Cellular 0/0
!
!
!
interface Loopback1
 ip address 1.1.1.1 255.255.255.255
!
interface Wlan-GigabitEthernet0/0
 description Internal switch interface connecting to the embedded AP
!
interface GigabitEthernet0/0
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface wlan-ap0
```

```
 description Service module interface to manage the embedded AP
 no ip address
 shutdown
 arp timeout 0
 no mop enabled
 no mop sysid
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Cellular0/0/0
 ip address negotiated
 encapsulation ppp
 no ip mroute-cache
 load-interval 30
 dialer in-band
 dialer pool-member 1
 dialer-group 1
 no peer default ip address
 fair-queue 64 16 0
 no ppp lcp fast-start
 routing dynamic
!
interface Vlan1
 no ip address
!
interface Dialer1
 ip address negotiated
 encapsulation ppp
 dialer pool 1
 dialer idle-timeout 0
 dialer string cdma
 dialer caller 9994082188382 callback
 dialer-group 1
!
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 Dialer1
!
no ip http server
no ip http secure-server
!
!
dialer-list 1 protocol ip permit
!
!
snmp-server group steeler3g v3 auth match exact notify 3gView
snmp-server community public RW
snmp-server community steeler3g-test RW
snmp-server enable traps c3g
snmp-server host 172.27.168.158 public  c3g
snmp-server host 172.27.168.158 public udp-port 6059
!
control-plane
!
!
line con 0
 exec-timeout 0 0
line aux 0
line 0/0/0
 script dialer cdma
 login
```

```
 modem InOut
 no exec
 transport input all
 transport output all
 rxspeed 3100000
 txspeed 1800000
line 67
 no activation-character
 no exec
 transport preferred none
 transport input all
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
line vty 0 3
 password lab
 login
!
exception data-corruption buffer truncate
scheduler allocate 20000 1000
end

1900#
```

Upgrading Modem Firmware

The fixed and modular ISRs have a 3G modem from Sierra Wireless. The firmware for the modem is upgradable using Cisco IOS commands. The firmware is packaged in a tar distribution file and can be downloaded from the wireless software download page on Cisco.com. Use the following procedure to upgrade the modem firmware:

Caution Before upgrading the modem to a new firmware version, please check if the new firmware version has been certified by your wireless service provider. Using an uncertified firmware version on the modem may impact the wireless service provider network adversely.

Refer to the following website for the latest certified firmware version for your carrier and IOS compatibility:

http://www.cisco.com/en/US/prod/routers/networking_solutions_products_genericcontent0900aecd80601f7e.html

To remotely download the firmware over the air, perform the following steps.

SUMMARY STEPS

Step 1 Go to the CDMA/EVDO firmware download website at:

http://software.cisco.com/download/navigator.html?mdfid=279119319&flowid=6999

and in the third column, select Verizon or Sprint, depending on the type of card you have.

Note For remote download, you can transfer this using the 3G wireless link from Cisco.com onto flash. You must configure external dialer and dialer persistent to bring the interface and the dialer up again.

Step 2 Download the appropriate CDMA firmware release under Wireless Integrated Switches and Routers.

Step 3 Copy the files to the device's flash.

Step 4 Use the archive command to untar the firmware distribution into router flash:

archive tar /xtract *source-url destination-url*

Step 5 Use the following command to initiate the firmware upgrade process:

microcode reload cellular *pa-bay slot* **cdma modem-provision**

Note For remote downloads, you will lose connectivity if 3G is your only link. Connectivity is restored after the download. If you have opted for logging in step 4, the firmware log file would be available on flash with the download status.

DETAILED STEPS

	Command or Action	Purpose
Step 1	Go to the Download Software site at: http://software.cisco.com/download/navigator.html and select Wireless > Wireless Integrated Switches and Routers. In the third column, select Verizon or Sprint, depending on the type of card you have.	Gives you access to Cisco Wireless WAN software downloads. Select firmware for Cisco 3G. **Note** This website is only available to registered Cisco.com users.
Step 2	Download the appropriate CDMA firmware release under Wireless Integrated Switches and Routers.	Downloads the modem firmware package to a TFTP/FTP server that is accessible from the router with 3G.
Step 3	Copy the files to the device's flash.	—
Step 4	**archive tar/xtract** *source-url destination-url* **Example:** `Router# archive tar/xtract tftp://192.168.1.1/MC8775_1_0_0_7_package.tar flash:`	Uncompresses the files of the modem firmware package and copies them to a location that is accessible by the router with 3G. • *source-url*—URL of the source location with the firmware TAR filename. Valid URLs can refer to TFTP or HTTP servers or to router flash memory. • *destination-url*—URL of the destination where the tar file would be extracted. Use router flash.
Step 5	**microcode reload cellular** *pa-bay slot* **cdma modem-provision** **Example:** `Router# microcode reload cellular 0 1 cdma modem-provision`	Initiates the firmware upgrade process. • *pa-bay*—Use 0 for EHWIC. • *slot*—Slot number where the EHWIC is plugged in. **Note** For remote download, you can transfer this using the 3G wireless link from Cisco.com onto flash. You must configure external dialer and dialer persistent to bring the interface and the dialer up again.

Caution Do not disconnect the power or switch the router off during the firmware upgrade process. This may result in permanent modem failure.

Command Reference

This section documents new and modified commands.

- cdma ddtm
- cdma event connection-status mib-trap
- cdma event ecio abate
- cdma event ecio onset
- cdma event modem-state mib-trap
- cdma event network mib-trap
- cdma event rssi abate
- cdma event rssi onset
- cdma event service mib-trap
- cdma event temperature abate
- cdma event temperature onset
- cdma gps mode
- cdma gps nmea
- cdma sms archive path
- cellular cdma activate iota
- cellular cdma activate manual
- cellular cdma activate oma-dm device config
- cellular cdma activate oma-dm ni-alert
- cellular cdma activate oma-dm prl-update
- cellular cdma activate otasp
- cellular cdma mode
- cellular cdma profile configure
- cellular cdma profile select
- cellular cdma sms delete
- cellular cdma sms send
- cellular cdma sms view
- debug cell-hwic driver
- debug cell-hwic firmware
- debug cell-hwic virt-con
- debug cellular messages all
- debug cellular messages async
- debug cellular messages data
- debug cellular messages gps
- debug cellular messages nmea
- debug cellular messages sms

- show cellular all
- show cellular connection
- show cellular gps
- show cellular hardware
- show cellular network
- show cellular profile
- show cellular radio
- show cellular security
- show cellular sms
- show controllers cellular
- show interfaces cellular
- show run interface cellular

cdma ddtm

On CDMA modems, data transmission is disrupted by incoming voice calls if data dedicated transmission mode (DDTM) is disabled. You can enable DDTM mode so the modem will ignore incoming voice calls.

To enable DDTM on a CDMA modem, use the **cdma ddtm** command in controller configuration mode. To disable DDTM, use the **no** form of this command.

cdma ddtm

no cdma ddtm

Syntax Description

This command has no arguments or keywords.

Command Default

DDTM is enabled by default.

Command Modes

Controller configuration (config-controller)

Command History

Releases	Modifications
15.1(4)M1	This command was introduced.

Usage Guidelines

Disable this feature only if you require the voice-initiated data callback feature.

Examples

The following example shows how to configure the **cdma ddtm** command:

```
router(config)# controller cellular 0/0
router(config-controller)# cdma ddtm
```

The following example shows how to configure the **no cdma ddtm** command:

```
router(config)# controller cellular 0/0
router(config-controller)# no cdma ddtm
router(config-controller)# end
```

The following output for the **show cellular connection** command shows that DDTM is enabled:

```
router# show cellular 0/0/0 connection
Phone number of outgoing call =
HDR AT State = Inactive, HDR Session State = Close
HDR Session Info:
    UATI (Hex) = 0000:0000:0000:0000:0000:0000:0000:0000
    Color Code = 0, RATI = 0x0
    Session duration = 0 msecs, Session start = 0 msecs
    Session end = 0 msecs, Authentication Status = Not authenticated
HDR DRC Value = 0, DRC Cover = 0, RRI = Pilot only
Current Transmitted = 0 bytes, Received = 0 bytes
Total Transmitted = 0 KB, Received = 0 KB
Current Call Status = None
```

```
Current Call Duration = 0 secs
Total Call Duration = 376179855 seconds
Current Call Type =
Last Call Disconnect Reason = Modem offline
Last Connection Error = None
HDR DDTM (Data Dedicated Transmission Mode) Preference = On
Mobile IP Error Code (RFC-2002) = 0 (Registration accepted)
```

cdma event connection-status mib-trap

To check the connection status of a 3G WAN MIB trap event, use the **cdma event connection-status mib-trap** command in controller configuration mode.

cdma event connection-status mib-trap {**All-cdma | active | connected | connecting | disconnected | dormant | error | inactive | idle | unknown**}

Syntax Description

All-cdma	All CDMA connection states.
active	Active state.
connected	Connected state.
connecting	Connecting state.
disconnected	Disconnected state.
dormant	Dormant state.
error	Error state.
inactive	Inactive state.
idle	Idle state.
unknown	Unknown state.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example shows you how to use this command:

```
router(config-controller)# cdma event connection-status mib-trap active
```

Related Commands

Command	Description
cdma event modem-state mib-trap	Sets the modem state for sending 3G WAN MIB trap events.
cdma event network mib-trap	Sends 3G WAN MIB trap events when network changes occur.
cdma event service mib-trap	Sends 3G WAN MIB trap events when service changes occur.

cdma event ecio abate

To set the threshold for a 3G WAN MIB trap ECIO event, use the **cdma event ecio abate** command in controller configuration mode.

cdma event ecio abate {**mib-trap** *mibtrap* | **threshold** *threshold-value*}

Syntax Description

mib-trap *mibtrap*	Specifies one of the following mib-trap technologies: • **1xrtt**: 1xRTT Service • **All-cdma**: All the CDMA Services • **evdoRel0**: EVDO Revision 0 Service • **evdoRelA**: EVDO Revision A Service • **evdoRelB**: EVDO Revision B Service
threshold *threshold-value*	Sets the threshold for sending MIB trap events to the specified value. When the ECIO abate value is greater than the specified threshold, a MIB trap event is sent to the administrator. Range of the threshold value is from -150 to 0 dBm.

Command Default

None

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events for all supported CDMA technologies when ECIO is greater than -50 dBm:

```
router(config-controller)# cdma event ecio abate mib-trap All-cdma
router(config-controller)# cdma event ecio abate threshold -50
```

The following example configures the router to send MIB trap events on the 1xrtt network when ECIO is greater than -100 dBm:

```
router(config-controller)# cdma event ecio abate mib-trap 1xrtt
router(config-controller)# cdma event ecio abate threshold -100
```

Related Commands

Command	Description
cdma event ecio onset	Sets the ECIO onset threshold value for sending 3G WAN MIB trap events.

cdma event ecio onset

To set the ECIO onset threshold value for sending 3G WAN MIB trap events, use the **cdma event ecio onset** command in controller configuration mode.

cdma event ecio onset {**mib-trap** *mibtrap* | **threshold** *threshold-value*}

Syntax Description

mib-trap *mibtrap*	Specifies the mib-trap network on which to send the MIB trap: • **1xrtt**: 1xRTT Service • **All-cdma**: All the CDMA Services • **evdoRel0**: EVDO Revision 0 Service • **evdoRelA**: EVDO Revision A Service • **evdoRelB**: EVDO Revision B Service
threshold *threshold-value*	Sets the threshold for sending MIB trap events to the specified value. When the ECIO value is less than the specified onset threshold, a MIB trap event is sent to the administrator. Range of the threshold value is from -150 to 0 dBm.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events on all supported CDMA networks when the ECIO value is below -50 dBm:

```
router(config-controller)# cdma event ecio onset mib-trap All-cdma
router(config-controller)# cdma event ecio onset threshold -50
```

The following example configures the router to send MIB trap events on the evdoRel0 network when the ECIO value is below -100 dBm:

```
router(config-controller)# cdma event ecio onset mib-trap evdoRel0
router(config-controller)# cdma event ecio onset threshold -100
```

Related Commands

Command	Description
cdma event ecio abate	Sets the ECIO abate threshold value for sending 3G WAN MIB trap events.

cdma event modem-state mib-trap

To set the modem state for sending 3G WAN MIB trap events, use the **cdma event modem-state mib-trap** command in controller configuration mode.

cdma event modem-state mib-trap {all | up | down}

Syntax Description

all	Sends MIB trap events when the modem is up or down.
up	Sends MIB trap events when the modem is up.
down	Sends MIB trap events when the modem is down.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events only when the modem is down:

```
router(config-controller)# cdma event modem-state mib-trap down
```

Related Commands

Command	Description
cdma event connection-status mib-trap	Checks the connection status of a 3G WAN MIB trap event.
cdma event network mib-trap	Sends 3G WAN MIB trap events when network changes occur.
cdma event service mib-trap	Sends 3G WAN MIB trap events when service changes occur.

cdma event network mib-trap

To configure the router to send 3G WAN MIB trap events when network changes occur, use the **cdma event network mib-trap** command in controller configuration mode.

cdma event network mib-trap

Syntax Description

This command has no arguments or keywords.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events in response to network changes (for example, switching from an AT&T network to a Verizon network):

```
router(config-controller)# cdma event network mib-trap
```

Related Commands

Command	Description
cdma event connection-status mib-trap	Checks the connection status of a 3G WAN MIB trap event.
cdma event modem-state mib-trap	Sets the modem state for sending 3G WAN MIB trap events.
cdma event service mib-trap	Sends 3G WAN MIB trap events when service changes occur.

cdma event rssi abate

To set the RSSI abate threshold value for sending 3G WAN MIB trap events, use the **cdma event rssi abate** command in controller configuration mode.

cdma event rssi abate {**mib-trap** *mibtrap* | **threshold** *threshold-value*}

Syntax Description

mib-trap *mibtrap*	Specifies the mib-trap network on which to send the MIB trap: • **1xrtt**: 1xRTT Service • **All-cdma**: All the CDMA Services • **evdoRel0**: EVDO Revision 0 Service • **evdoRelA**: EVDO Revision A Service • **evdoRelB**: EVDO Revision B Servic
threshold *threshold-value*	Sets the threshold for sending MIB trap events to the specified value. When the RSSI abate value is greater than the specified threshold (signal getting weaker), a MIB trap event is sent to the administrator. Range of the threshold value is from -150 to 0 dBm.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events for all supported CDMA technologies when RSSI is greater than -50 dBm:

```
router(config-controller)# cdma event rssi abate mib-trap All-cdma
router(config-controller)# cdma event rssi abate threshold -50
```

The following example configures the router to send MIB trap events on the evdoRel0 network when RSSI is greater than -100 dBm:

```
router(config-controller)# cdma event rssi abate mib-trap evdoRel0
router(config-controller)# cdma event rssi abate threshold -100
```

Related Commands

Command	Description
cdma event rssi onset	Sets the RSSI onset threshold value for sending 3G WAN MIB trap events.

cdma event rssi onset

To set the RSSI onset threshold value for sending 3G WAN MIB trap events, use the **cdma event rssi onset** command in controller configuration mode.

cdma event rssi onset {**mib-trap** *mibtrap* | **threshold** *threshold-value*}

Syntax Description

mib-trap *mibtrap*	Specifies the mib-trap network on which to send the MIB trap: • **1xrtt**: 1xRTT Service • **All-cdma**: All the CDMA Services • **evdoRel0**: EVDO Revision 0 Service • **evdoRelA**: EVDO Revision A Service • **evdoRelB**: EVDO Revision B Servic
threshold *threshold-value*	Sets the threshold for sending MIB trap events to the specified value. When the RSSI value is less than the specified onset threshold (signal getting stronger), a MIB trap event is sent to the administrator. Range of the threshold value is from -150 to 0 dBm.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events on all supported CDMA networks when RSSI is below -50 dBm:

```
router(config-controller)# cdma event rssi onset mib-trap All-cdma
router(config-controller)# cdma event rssi onset threshold -50
```

The following example configures the router to send MIB trap events on the evdoRel0 network when RSSI is below -100 dBm:

```
router(config-controller)# cdma event rssi onset mib-trap evdoRel0
router(config-controller)# cdma event rssi onset threshold -100
```

Related Commands

Command	Description
cdma event rssi abate	Sets the RSSI abate threshold value for sending 3G WAN MIB trap events.

cdma event service mib-trap

To configure the router to send 3G WAN MIB trap events when service changes occur, use the **cdma event service mib-trap** command in contoller configuration mode.

cdma event service mib-trap

Syntax Description

This command has no arguments or keywords.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example configures the router to send MIB trap events in response to service changes (for example, switching from evdoRel0 to evdoRelA):

```
router(config-controller)# cdma event service mib-trap
```

Related Commands

Command	Description
cdma event connection-status mib-trap	Checks the connection status of a 3G WAN MIB trap event.
cdma event modem-state mib-trap	Sets the modem state for sending 3G WAN MIB trap events.
cdma event network mib-trap	Sends 3G WAN MIB trap events when network changes occur.

cdma event temperature abate

To set the temperature abate threshold value for sending 3G WAN MIB trap events, use the **cdma event temperature abate** command in controller configuration mode.

cdma event temperature abate {**mib-trap** | **threshold** *threshold-value*}

Syntax Description

mib-trap	Enables or disables temperature abate MIB trap events.
threshold *threshold-value*	Sets the threshold in Celsius for sending MIB trap events to the specified value. When the temperature abate value is less than the specified threshold (lower temperature), a MIB trap event is sent to the administrator. Range of the threshold value is from -58 to 212°F (-50 to 100°C).

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example enables temperature abate MIB trap events, then configures the router to send MIB trap events when temperature goes below 32°F (0°C):

```
router(config-controller)# cdma event temperature abate mib-trap
router(config-controller)# cdma event temperature abate threshold 0
```

Related Commands

Command	Description
cdma event temperature onset	Sets the temperature onset threshold value.

cdma event temperature onset

To set the temperature onset threshold value for sending 3G WAN MIB trap events, use the **cdma event temperature onset** command in controller configuration mode.

cdma event temperature onset {**mib-trap** | **threshold** *threshold-value*}

Syntax Description

mib-trap	Enables or disables temperature onset MIB trap events.
threshold *threshold-value*	Sets the threshold in Celsius for sending MIB trap events to the specified value. When the temperature onset value is greater than the specified threshold (higher temperature), a MIB trap event is sent to the administrator. Range of the threshold value is from -58 to 212°F (-50 to 100°C).

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example enables temperature onset MIB trap events, then configures the router to send MIB trap events when temperature goes above 32°F (0°C):

```
router(config-controller)# cdma event temperature onset mib-trap
router(config-controller)# cdma event temperature onset threshold 0
```

Related Commands

Command	Description
cdma event temperature abate	Sets the temperature abate threshold value.

cdma gps mode

To enable the GPS mode, use the **cdma gps mode** command in privileged EXEC mode.

cdma gps mode standalone

Syntax Description

standalone	Ena bles autonomous GPS without assistance data. The Mobile Station computes its own location; no position determination equipment is required. This is the Default mode.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example enables the standalone GPS mode:

```
router# cdma gps mode standalone
```

Related Commands

Command	Description
debug cellular messages gps	Displays the GPS background activities for debugging purposes.
show cellular gps	Displays GPS statistics.

cdma gps nmea

To enable or disable GPS National Marine Electronics Association (NMEA) stream state, use the **cdma gps nmea** command in privileged EXEC mode.

cdma gps nmea

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example enables the NMEA stream state:

```
router# cdma gps nmea
```

Related Commands

Command	Description
debug cellular messages nmea	Displays NMEA background activities for debugging purposes.

cdma sms archive path

To configure the FTP settings of the directory used to archive SMS messages, use the **cdma sms archive path** command in controller configuration mode.

cdma sms archive path ftp:*FTP-path*

Syntax Description		
	ftp:*FTP-path*	Path to the directory on the FTP server used to archive SMS messages.

Command Default None

Command Modes Controller configuration (config-controller)

Command History	Release	Modification
	15.1(3)T	This command was introduced.

Examples The following example sets the FTP path to the SMS_archive directory on the FTP server at 192.168.1.3:

```
router(config-controller)# cdma sms archive path
ftp://username:password@192.168.1.3/SMS_archive
```

Related Commands

Command	Description
cellular cdma sms delete	Deletes SMS messages on the CDMA band.
cellular cdma sms send	Sends outgoing SMS messages on the CDMA band.
cellular cdma sms view	Displays all incoming messages stored on the SIM card.
debug cellular messages sms	Displays SMS background activities for debugging purposes.
show cellular sms	Displays SMS statistics.

cellular cdma activate iota

To periodically refresh the modem data profile using Internet-based over-the-air provisioning (IOTA), use the **cellular cdma activate iota** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma activate iota**

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

IOTA is used by some wireless service providers to activate the modem data profile . Use the **cellular cdma activate iota** command to display the current active connection state and statistics. (Ask your carrier whether IOTA is supported and how often a refresh is needed.)

You can verify the updated modem data profile using the **show cellular** *slot/wic_slot/port* **profile** command.

Note Use this command only if you are using an HWIC-3G-CDMA-S interface card.

Examples

The following is a sample output from the **cellular cdma activate iota** command:

```
router# cellular 0/0/0 cdma activate iota
Begin IOTA
router#
*Feb  6 23:32:21.339: IOTA Status Message Received. Event: IOTA Start, Result: SUCCESS
*Feb  6 23:32:21.339: Please wait till IOTA END message is received
*Feb  6 23:32:21.339: It can take up to 5 minutes
*Feb  6 23:32:40.867: OTA State = SPL unlock, Result = Success
*Feb  6 23:32:45.235: OTA State = Parameters commited to NVRAM, Result = Success
*Feb  6 23:32:52.087: Over the air provisioning complete; Result:Success
*Feb  6 23:32:52.615: IOTA Status Message Received. Event: IOTA End, Result: SUCCESS
```

Related Commands

Command	Description
cellular cdma activate manual	Manually activates a cellular account using the over-the-air service procedure.
show cellular profile	Displays the cellular profile information.

cellular cdma activate manual

To manually activate the modem, use the **cellular cdma activate manual** command in privileged EXEC mode.

Note The modem activation process is specific to the carrier. Ask your carrier whether manual activation—using mobile directory number (MDN), mobile subscriber identification number (MSID), and mobile subscriber lock (MSL)—or activation using over-the-air service provisioning is supported.

cellular *unit* **cdma activate manual** {**mdn** | **msid** | **msl**}

Syntax Description

unit	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
mdn	Ten-digit MDN.
msid	Ten-digit MSID.
msl	MDL obtained from your service provider.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

Use the **show cellular network** command to obtain the system identification number and the network identification number.

You can verify whether the modem has been activated using the **show cellular** *slot/wic_slot/port* **all** command.

Note Use this command only if you have an HWIC-3G-CDMA-S interface card.

Examples

The following is a sample output from the **cellular cdma activate manual** command:

```
router# cellular 0/0/0 cdma activate manual 1234567890 1234567890 123456
NAM 0 will be configured and will become Active
Modem will be activated with following Parameters
MDN :1234567890; MSID :1234567890; SID :4183; NID 87:
Checking Current Activation Status
Modem activation status: Not Activated
Begin Activation
Account activation - Step 1 of 5
Account activation - Step 2 of 5
Account activation - Step 3 of 5
*Jan  1 23:57:41.639: %HWIC_CELL-1-MGMT_ERROR: [Cellular0/0/0] Error response (0x1038)
received from modem (err3:invalid operation type).
Unable to configure MDN
Modem Could not be activated
c3845-1#
*Jan  1 23:57:46.703: %HWIC_CELL-1-MODEM_ACK_FAIL: [Cellular0/0/0] Modem Ack not received.
```

The following is a sample output from the **show cellular profile** command after the modem has been activated:

```
router# show cellular 0/3/0 profile

Profile Information
====================
Electronic Serial Number (ESN) = 0x603C6426
Modem activated = YES

Account Information:
=====================
Activation Date: 20070221
Phone Number (MDN) : 2029976763
Mobile Station Identifier (MSID) : 2029976763

Data Profile Info:
====================
Number of data profiles configured : 1
Current active data profile : 0

Data Profile 0 Information (Active)
=================================
NAI (Network Access Identifier) = 2029976763@vzw3g.com
MN-HA SS = Set
MN-HA SPI = 300
MN-AAA SS = Set
MN-AAA SPI = 2
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 255.255.255.255
Secondary Home Agent Address = 255.255.255.255
```

Related Commands

Command	Description
cellular cdma activate iota	Manually activates a cellular account using the Internet over-the-air service procedure.
show cellular all	Displays all the modem information.
show cellular profile	Displays the cellular profile information.

cellular cdma activate oma-dm device config

To start a user-initiated Open Mobile Alliance Device Management (OMA-DM) session to provision an account and MIP1 (Mobile IP) profile update, use the **cellular cdma activate oma-dm device config** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma activate oma-dm device config**

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)YB1	This command was introduced.

Usage Guidelines

The **cellular cdma activate oma-dm device config** command refreshes the mobile directory number (MDN) and mobile subscriber identification number (MSID) on the account.

Before you execute this command, terminate any existing active or dormant data connection. The modem is activated automatically when it powers up using Hands Free Activation. Use this command only when activation fails or you need to update your account parameters.

To view profile and MIB information, use the **show cellular profile** command.

Examples

The following example shows the output for slot 0, WIC slot 0, and port 0 of HWIC-3G-CDMA:

```
router# cellular 0/0/0 cdma activate oma-dm device-config
Modem is activated
MIP profile 1 will be updated and will be active, if command is successful
Beginning OMA-DM.

router#
*Feb  5 20:50:18.207: %CELLWAN-2-OMA_DM_ACTIVE: [Cellular0/0/0]: OMA DM Device
Configuration session is active
Router_1841_Live#
*Feb  5 20:50:34.755: %CELLWAN-2-OMA_DM_SUCCESS: [Cellular0/0/0]: OMA DM Device
Configuration completed successfully
```

Related Commands

Command	Description
cellular cdma activate oma-dm ni-alert	Allows or denies a network-initiated alert (NIA) queued in the modem.
cellular cdma activate oma-dm prl-update	Starts a user-initiated OMA-DM session to get an over-the-air PRL update.
debug cellular messages oma-dm	Starts OMA-DM debugging.
show cellular oma-dm	Displays OMA-DM session details.
show cellular profile	Displays the cellular profile information.

cellular cdma activate oma-dm ni-alert

To allow or deny a network-initiated alert (NIA) queued in the modem, use the **cellular cdma activate oma-dm ni-alert** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma activate oma-dm ni-alert** {**allow** | **deny**}

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
allow	Allows a network-initiated alert.
deny	Denies a network-initiated alert.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)YB1	This command was introduced.

Usage Guidelines

On execution of the **cellular cdma activate oma-dm ni-alert** command, a message warns that the current data connection will be interrupted. You must confirm if you want to proceed with this command.

Note If you deny the NIA, depending on the SKU of the modem, the NIA may be available for a later attempt or permanently deleted from the system.

Examples

The following is a sample output for slot 0, WIC slot 0, and port 0 of HWIC-3G-CDMA with network-initiated alert while the modem is in dormant state:

```
*Feb  5 20:57:04.827: %CELLWAN-2-OMA_DM_NI_ALERT: [Cellular0/0/0]: OMA DM NI Alert is
received for Device Configuration
Please execute 'cellular <unit> cdma activate oma-dm ni-alert [allow | deny]'
router# cellular 0/0/0 cdma activate oma-dm ni-alert allow
Modem is activated
!!!WARNING: Data connection will be terminated. Service will be interrupted until the NI
session is completed.
Are you sure?(y/n) [confirm]
[Cellular0/0/0]:The interface will be shutdown to allow the Network-Initiated OMA DM
session. This will terminate any active data connection.

OMA DM NI alert: Interactive response accepted

*Feb  5 20:57:19.611: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cellular0/0/0,
changed state to down
*Feb  5 20:57:20.627: %LINK-5-CHANGED: Interface Cellular0/0/0, changed state to
administratively down
*Feb  5 20:57:26.063: %CELLWAN-2-OMA_DM_ACTIVE: [Cellular0/0/0]: OMA DM Device
Configuration session is active
```

```
*Feb  5 20:57:36.847: %CELLWAN-2-OMA_DM_SUCCESS: [Cellular0/0/0]: OMA DM Device
Configuration completed successfully
```

The following is a sample output from the **cellular** *slot/wic_slot/port* **cdma activate oma-dm ni-alert deny** command for slot 0, WIC slot 0, and port 0 of HWIC-3G-CDMA**:**

```
*Feb  5 21:01:08.487: %CELLWAN-2-OMA_DM_NI_ALERT: [Cellular0/0/0]: OMA DM NI Alert is
received for Device Configuration
Please execute 'cellular <unit> cdma activate oma-dm ni-alert [allow | deny]'

Enzo-sustaining_1841_Live# cellular 0/0/0 cdma activate oma-dm ni-alert deny
Modem is activated
OMA DM NI alert: Interactive response accepted
```

Table 9 describes the output fields from the command.

Table 9 cellular cdma activate oma-dm ni-alert Field Descriptions

Field	Description
Interactive response accepted	Alert response is accepted by the modem. You will see OMA-DM status messages in SYSLOG or on the console.
Fail: Interactive response not expected	No alert queued in the modem.
Fail: Invalid response	Not a valid response.

Related Commands

Command	Description
cellular cdma activate oma-dm device config	Starts a user-initiated OMA-DM session to provision an account and profile update.
cellular cdma activate oma-dm prl-update	Starts a user-initiated OMA-DM session to get an over-the-air PRL update.
debug cellular messages oma-dm	Starts OMA-DM debugging.
show cellular oma-dm	Displays OMA-DM session details.
show cellular profile	Displays the cellular profile information.

cellular cdma activate oma-dm prl-update

To start a user-initiated Open Mobile Alliance Device Management (OMA-DM) session to get an over-the-air PRL update, use the **cellular cdma activate oma-dm prl-update** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma activate oma-dm prl-update**

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)YB1	This command was introduced.

Usage Guidelines

Preferred roaming list (PRL) upates are provided periodically by the service provider. If no updates are available, an empty session error message is returned.

Note If the PRL is updated successfully, the modem will be reset.

Examples

The following is a sample ouptut for slot 0, WIC slot 0, and port 0 of HWIC-3G-CDMA when the update is successful:

```
router# cellular 0/0/0 cdma activate oma-dm prl-update
Modem is activated
Beginning OMA-DM
*Jan 27 18:32:08.087: %CELLWAN-2-OMA_DM_ACTIVE: [Cellular0/0/0]: OMA DM PRL Update session
is active
*Jan 27 18:32:31.643: %CELLWAN-2-OMA_DM_SUCCESS: [Cellular0/0/0]: OMA DM PRL Update
completed successfully
```

The following is a sample ouptut for slot 0, WIC slot 0, and port 0 of HWIC-3G-CDMA when the update is unsuccessful:

```
router# cellular 0/0/0 cdma activate oma-dm  prl-update
Modem is activated
Beginning OMA-DM.
*Feb  5 21:33:23.795: %CELLWAN-2-OMA_DM_ACTIVE: [Cellular0/0/0]: OMA DM PRL Update session
is active
*Feb  5 21:34:03.587: %CELLWAN-2-OMA_DM_ERROR: [Cellular0/0/0]: OMA DM PRL Update Failed -
Error:0x504(Unrecoverable network error)
```

Related Commands

Command	Description
cellular cdma activate oma-dm device config	Starts a user-initiated OMA-DM session to provision an account and profile update.
cellular cdma activate oma-dm ni-alert	Allows or denies a network-initiated alert (NIA) queued in the modem.
debug cellular messages oma-dm	Starts OMA-DM debugging.
show cellular oma-dm	Displays OMA-DM session details.
show cellular profile	Displays the cellular profile information.

cellular cdma activate otasp

To activate a wireless account using over-the-air service provisioning (OTASP), use the **cellular cdma activate otasp** command in privileged EXEC mode.

Note The modem activation process is specific to the carrier. Check with your carrier if they support manual activation—using mobile directory number (MDN), mobile subscriber identification number (MSID), and mobile subscriber lock (MSL)—or activation using OTASP.

cellular *slot/wic_slot/port* **cdma activate otasp** *phone_number*

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
phone_number	Phone number that you must dial to begin activation using OTASP. This number is specific to a wireless provider. For Verizon Wireless, it is *22899.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

You can verify the modem activation using the **show cellular** *slot/wic_slot/port* **all** command.

Note Use this command only if you are using an HWIC-3G-CDMA-V interface card.

Examples

The following is a sample output from the **cellular cdma activate otasp** command:

```
router# cellular 0/1/0 cdma activate otasp *22899

Beginning OTASP activation
OTASP number is *22899
router#
*Feb  6 23:18:45.393: OTA State = SPL unlock, Result = Success
*Feb  6 23:19:10.229: OTA State = PRL downloaded, Result = Success
*Feb  6 23:19:11.169: OTA State = Profile downloaded, Result = Success
*Feb  6 23:19:11.173: OTA State = MDN downloaded, Result = Success
*Feb  6 23:19:12.537: OTA State = Parameters commited to NVRAM, Result = Success
*Feb  6 23:19:14.613: Over the air provisioning complete; Result:Success
```

The following is a sample output from the **show cellular profile** command after the modem has been activated:

```
router# show cellular 0/3/0 profile

Profile Information
====================
Electronic Serial Number (ESN) = 0x603C6426
Modem activated = YES

Account Information:
======================
Activation Date: 20070221
Phone Number (MDN) : 2029976763
Mobile Station Identifier (MSID) : 2029976763

Data Profile Info:
====================
Number of data profiles configured : 1
Current active data profile : 0

Data Profile 0 Information (Active)
==================================
NAI (Network Access Identifier) = 2029976763@vzw3g.com
MN-HA SS = Set
MN-HA SPI = 300
MN-AAA SS = Set
MN-AAA SPI = 2
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 255.255.255.255
Secondary Home Agent Address = 255.255.255.255
```

Related Commands

Command	Description
show cellular profile	Displays the cellular profile information.

cellular cdma mode

To configure the modem mode to connect to 1xRTT, EVDO, or hybrid services, use the **cellular cdma mode** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma mode** {**hybrid** | **EVDO-only** | **1xRTT-only**}

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
hybrid	Connects to EVDO/1xRTT services (default).
EVDO-only	Connects to EVDO service only.
1xRTT-only	Connects to 1xRTT service only.

Command Default

Connects to hybrid (EVDO/1xRTT) services.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)YB1	This command was introduced.

Usage Guidelines

This command is executed only upon confirmation from the user. A service mode change is followed by a modem reset.

Examples

The following is a sample output for slot 0, WIC slot 1, and port 1 of HWIC-3G-CDMA:

```
router# cellular 0/1/1 cdma mode ?
  1xRTT   Modem will connect to 1xRTT only service
  evdo    Modem will connect to EVDO only service
  hybrid  Modem will connect to EVDO and 1xRTT service (default behavior)
```

Table 10 describes the output fields from the command.

Table 10 cellular cdma mode Field Descriptions

Field	Description
1xRTT	Modem will connect to 1xRTT service only.
EVDO	Modem will connect to EVDO service only.
Hybrid	Modem will connect to EVDO and 1xRTT services (default).

Related Commands

Command	Description
cellular cdma activate iota	Provisions data profile using Internet-based over-the-air provisioning (IOTA). **Note** IOTA is supported only with certain wireless service providers. Please check with your wireless service provider.
cellular cdma activate manual	Manually activates a cellular account using the over-the-air service (OTA) procedure.
cellular cdma activate otasp	Activates a cellular account using over-the-air service provisioning (OTASP).

cellular cdma profile configure

To manipulate CDMA modem data profile information, use the **cellular cdma profile configure** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma profile configure** <*profile number*> <*primary HA address*> <*secondary HA address*><*mobile HA*><*NAI*> <*MN-AAA SS*> <*MN-HA SS*> <*MN-AAA SPI*><*MN-HA SPI*> <*rev-tunneling*>

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
profile number	Profile number to be configured.
primary HA address	Primary Home Agent Address as obtained from the service provider.
secondary HA address	Secondary Home Agent Address as obtained from the service provider.
*mobile HA**	Mobile Home Agent. This parameter is only needed for generic SKUs.
NAI	Network Access Identifier.
MN-AAA SS	Mobile Node AAA Shared Secret.
MN-HA SS	Mobile Node Home Agent Shared Secret.
*MN-AAA SPI**	Mobile Node AAA Security Parameter Index.
*MN-HA SPI**	Mobile Node Home Agent Security Parameter Index.
*rev-tunneling**	Reverse tunneling preference.
* Denotes parameters only applicable to generic HWIC-3G-CDMA and EHWIC-3G-EVDO-B SKUs.	

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)YB1	This command was introduced.

Usage Guidelines

This command is not supported for the HWIC-3G-CDMA-V SKU.

Examples

The following is a sample output for the **cellular** *unit* **cdma profile configure** command.

Sample Output for HWIC-3G-CDMA

```
router#cellular 0 cdma profile configure ?
  <1-5>  profile number
router#cellular 0 cdma profile configure 5 ?
  A.B.C.D  Primary HA Address
router#cellular 0 cdma profile configure 5 100.1.1.1 ?
  A.B.C.D  Secondary HA Address
router#cellular 0 cdma profile configure 5 100.1.1.1 200.1.1.1 ?
  WORD  Network Access Identifier (Ex:username@domain)
router#$le configure 5 100.1.1.1 200.1.1.1 testing@sp.com ?
  WORD  MN-AAA Shared Secret
```

```
router#$le configure 5 100.1.1.1 200.1.1.1 testing@sp.com kkk ?
  WORD  MN-HA Shared Secret
router#$le configure 5 100.1.1.1 200.1.1.1 testing@sp.com kkk mmm ?
  <cr>
router#$le configure 5 100.1.1.1 200.1.1.1 testing@sp.com kkk mmm
Profile 5 will be configured with following parameters:
NAI (Network Access Identifier) = testing@sp.com
Home Address = 0.0.0.0
Primary Home Agent Address = 100.1.1.1
Secondary Home Agent Address = 200.1.1.1
MN-AAA SS = Set
MN-HA SS = Set
MN-AAA SPI = 1234
MN-HA SPI = 1234
Reverse Tunneling Preference = Set
!!!WARNING: Modem will be reset
Are you sure? [confirm]
Done configuring - Please wait while the modem resets
*Feb 25 21:21:37.504: %CISCO800-2-MODEM_REMOVAL_DETECTED: Cellular0 modem is now REMOVED
*Feb 25 21:21:37.504: %CISCO800-2-CELLULAR_INTERFACE_NOT_SHUTDOWN: WARNING: Cellular0
interface should be shutdown before removing modem. Reload Required to reset interface
*Feb 25 21:21:38.508: %LINEPROTO-5-UPDOWN: Line protocol on Interface Cellular0, changed
state to down
*Feb 25 21:21:43.264: %CELLWAN-2-HEART_BEAT_TIMEOUT: No heart beat signal from Cellular0
*Feb 25 21:21:43.540: %CISCO800-2-MODEM_INSERTED_DETECTED: Cellular0 modem is now INSERTED
*Feb 25 21:21:43.544: %CELLWAN-2-MODEM_DOWN: Cellular0 modem is DOWN
*Feb 25 21:21:45.540: %LINK-5-CHANGED: Interface Cellular0, changed state to reset
Profile 5 configured successfully
router#
router#
*Feb 25 21:21:48.648: %CELLWAN-2-MODEM_UP: Cellular0 modem is now UP
router#
router#sh
*Feb 25 21:21:50.540: %LINK-3-UPDOWN: Interface Cellular0, changed state to down
router#show cellu
router#show cellular 0 p
router#show cellular 0 profile 5
Electronic Serial Number (ESN) = 0x605F6982 [09606252930]
Modem activated = YES
Account Information:
=====================
Activation Date: Not available
Phone Number (MDN) : 4084205046
Mobile Station Identifier (MSID) : 4084205046
Data Profile Info:
=====================
Number of data profiles configurable : 5
Current active data profile : 1
Data Profile 5 Information
==================================
NAI (Network Access Identifier) = testing@sp.com
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 100.1.1.1
Secondary Home Agent Address = 200.1.1.1
router#
```

cellular cdma profile select

To select a CDMA modem data profile, use the **cellular cdma profile select** command in privileged EXEC mode.

cellular *slot/wic_slot/port* **cdma profile select** <*profile number*> <*primary HA address*> <*secondary HA address*> <*mobile HA*> <*NAI*> <*MN-AAA SS*> <*MN-HA SS*> <*MN-AAA SPI*> <*MN-HA SPI*> <*rev-tunneling*>

Syntax Description

slot/wic_slot/port	Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
profile number	Profile number to be configured.
primary HA address	Primary Home Agent Address as obtained from the service provider.
secondary HA address	Secondary Home Agent Address as obtained from the service provider.
*mobile HA**	Mobile Home Agent. This parameter is only needed for generic SKUs.
NAI	Network Access Identifier.
MN-AAA SS	Mobile Node AAA Shared Secret.
MN-HA SS	Mobile Node Home Agent Shared Secret.
*MN-AAA SPI**	Mobile Node AAA Security Parameter Index.
*MN-HA SPI**	Mobile Node Home Agent Security Parameter Index.
*rev-tunneling**	Reverse tunneling preference.
** Denotes parameters only applicable to generic HWIC-3G-CDMA and EHWIC-3G-EVDO-B SKUs.*	

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(22)YB1	This command was introduced.

Usage Guidelines

This command is not supported for the HWIC-3G-CDMA-V SKU.

Examples

The following is a sample output from the **cellular** *slot/wic_slot/port* **cdma profile select** command for HWIC-3G-CDMA:

```
router# cellular 0 cdma profile select 5 ?
  <cr>
router# cellular 0 cdma profile select 5
Profile 5 will become active
!!!WARNING: Modem will be reset
Are you sure? [confirm]
Done configuring - Please wait while the modem resets
*Feb 25 21:23:58.224: %CISCO800-2-MODEM_REMOVAL_DETECTED: Cellular0 modem is now REMOVED
*Feb 25 21:23:58.224: %CISCO800-2-CELLULAR_INTERFACE_NOT_SHUTDOWN: WARNING: Cellular0
interface should be shutdown before removing modem. Reload Required to reset interface
*Feb 25 21:23:58.232: %CELLWAN-2-MODEM_DOWN: Cellular0 modem is DOWN
```

```
*Feb 25 21:23:59.784: %CISCO800-2-MODEM_INSERTED_DETECTED: Cellular0 modem is now INSERTED
*Feb 25 21:24:04.900: %CELLWAN-2-MODEM_UP: Cellular0 modem is now UP
Profile 5 selected successfully
router#
router#
router#
router#
router# show cellular 0 profile 5
Electronic Serial Number (ESN) = 0x605F6982 [09606252930]
Modem activated = YES
Account Information:
=====================
Activation Date: Not available
Phone Number (MDN) : 4084205046
Mobile Station Identifier (MSID) : 4084205046
Data Profile Info:
====================
Number of data profiles configurable : 5
Current active data profile : 5
Data Profile 5 Information (Active)
<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<
==================================
NAI (Network Access Identifier) = testing@sp.com
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 100.1.1.1
Secondary Home Agent Address = 200.1.1.1
router#
```

Related Commands

Command	Description
cellular cdma activate iota	Provisions data profile using Internet-based over-the-air provisioning (IOTA). **Note** IOTA is supported only with certain wireless service providers. Please check with your wireless service provider.
cellular cdma activate manual	Manually activates a cellular account using the over-the-air service (OTA) procedure.
cellular cdma activate oma-dm device config	Starts a user-initiated OMA-DM session for modem activation.
cellular cdma activate otasp	Activates a cellular account using over-the-air service provisioning (OTASP).

cellular cdma sms delete

To delete an SMS message on the CDMA band, use the **cellular cdma sms delete** command in privileged EXEC mode.

cellular *unit* **cdma sms delete** {**all** | *message-id*}

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.
all	Deletes all messages.
message-id	ID of the message to be deleted. Range is 0 to 255.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example deletes all SMS messages:

```
router# cellular 0/1/0 cdma sms delete all
```

Related Commands

Command	Description
cdma sms archive path	Configures the FTP settings of the directory used to archive SMS messages.
cellular cdma sms send	Sends outgoing SMS messages on the CDMA band.
cellular cdma sms view	Displays all incoming messages stored on the SIM card.
debug cellular messages sms	Displays SMS background activities for debugging purposes.
show cellular sms	Displays SMS statistics.

cellular cdma sms send

To send an outgoing SMS message on the CDMA band, use the **cellular cdma sms send** command in privileged EXEC mode.

cellular *unit* **cdma sms send** *destination-number sms-content*

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.
destination-number	Telephone number of SMS message recipient.
sms-content	SMS message text that is sent to recipient. The message can be no more than 160 characters long.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example shows how to send an SMS message:

```
router# cellular 0/1/0 cdma sms send <phone number> "Test message"
```

Related Commands

Command	Description
cdma sms archive path	Configures the FTP settings of the directory used to archive SMS messages.
cellular cdma sms delete	Deletes SMS messages on the CDMA band.
cellular cdma sms view	Displays all incoming messages stored on the SIM card.
debug cellular messages sms	Displays SMS background activities for debugging purposes.
show cellular sms	Displays SMS statistics.

cellular cdma sms view

To display all incoming messages on the CDMA band stored on the SIM card, use the **cellular cdma sms view** command in privileged EXEC mode.

cellular *unit* **cdma sms view** {**summary** | **all** | *message-id*}

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.
summary	Displays the first few characters of a message.
all	Displays the entire payload of all messages.
message-id	Displays the entire payload of the specified message. The ID of the message to be viewed. Range is 0 to 255.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following is a sample output from the **cellular cdma sms view** command:

```
router# cellular 0/1/0 cdma sms view 3
SMS ID: 3
TIME: 10/05/04 21:56:58
FROM: 4087993680
SIZE: 32
from john This is a test message
```

Related Commands

Command	Description
cdma sms archive path	Configures the FTP settings of the directory used to archive SMS messages.
cellular cdma sms delete	Deletes SMS messages on the CDMA band.
cellular cdma sms send	Sends outgoing SMS messages on the CDMA band.
debug cellular messages sms	Displays SMS background activities for debugging purposes.
show cellular sms	Displays SMS statistics.

debug cell-hwic driver

To debug the Cisco IOS driver for the cellular interface, use the **debug cell-hwic driver** command in privileged EXEC mode.

debug cell-hwic *unit* **driver** {**crcdump** | **errdump** | **errors**}

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.
crcdump	CRC error details.
errdump	Other error details.
errors	Errors debugging.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command for debugging purposes only.

Related Commands

Command	Description
debug cellular firmware	Displays Cisco IOS firmware information.
debug cellular messages async	Debugs cellular async.
debug cellular messages data	Prints Cisco IOS data path debug messages.
debug cellular messages dm	Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.
debug cellular messages management	Prints management path messages, such as CnS.
debug cell-hwic virt-con	Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.

debug cell-hwic firmware

To see the Cisco IOS firmware information, use the **debug cell-hwic firmware** command in privileged EXEC mode.

debug cell-hwic *unit* **firmware**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.
12.4(22)YB1	This command was integrated into Cisco IOS Release 12.4(22)YB1.

Usage Guidelines

Use this command for debugging purposes only.

Related Commands

Command	Description
debug cellular messages async	Debugs cellular async.
debug cellular messages data	Prints Cisco IOS data path debug messages.
debug cell-hwic driver	Debugs the Cisco IOS driver.
debug cell-hwic virt-con	Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.

debug cell-hwic virt-con

To redirect the Nios II console driver messages to display in the Cisco IOS router console environment, use the **debug cell-hwic virt-con** command in privileged EXEC mode.

debug cell-hwic *unit* **virt-con** [**clear | disable | dump-data-structs | log | monitor | wrapper-on | wrapper-off**]

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.
clear	(Optional) Clears all virtual console debug log messages.
disable	(Optional) Disables virtual console real-time debug monitoring.
dump-data-structs	(Optional) Dumps virtual console data structures.
log	(Optional) Displays virtual console messages from the debug log.
monitor	(Optional) Enables monitoring of real-time virtual console debug messages.
wrapper-on	(Optional) Disables wraparound for virtual console log messages.
wrapper-off	(Optional) Enables wraparound for virtual console log messages.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.4(22)YB1	This command was integrated into Cisco IOS Release 12.4(22)YB1.

Usage Guidelines

Use this command for debugging purposes only.

Related Commands

Command	Description
debug cellular messages all	Prints all Cisco IOS driver debug messages.
debug cellular messages async	Debugs cellular async.
debug cellular messages data	Prints Cisco IOS data path debug messages.
debug cellular messages dm	Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.
debug cellular messages management	Prints management path messages, such as CnS.
debug cell-hwic driver	Debugs the Cisco IOS driver.
debug cell-hwic firmware	Displays Cisco IOS firmware information.

debug cellular messages all

To print all Cisco IOS driver debug messages, use the **debug cellular messages all** command in privileged EXEC mode.

debug cellular *unit* **messages all**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

Use this command for debugging purposes only.

Related Commands

Command	Description
debug cellular messages async	Debugs cellular async.
debug cellular messages data	Prints Cisco IOS data path debug messages.
debug cell-hwic virt-con	Redirects the Nios II console driver messages to display in the Cisco IOS router console environment.

debug cellular messages async

To debug cellular async, use the **debug cellular messages async** command in privileged EXEC mode.

debug cellular *unit* **messages async**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

Use this command for debugging purposes only.

Related Commands

Command	Description
debug cellular messages all	Prints all Cisco IOS driver debug messages.
debug cellular messages data	Prints Cisco IOS data path debug messages.
debug cell-hwic virt-con	Redirects the Nios II console driver messages to display in the Cisco IOS router console environment.

debug cellular messages data

To print Cisco IOS data path debug messages, use the **debug cellular messages data** command in privileged EXEC mode.

debug cellular *unit* **messages data**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

Use this command for debugging purposes only.

Related Commands

Command	Description
debug cellular messages all	Prints all Cisco IOS driver debug messages.
debug cellular messages async	Debugs cellular async.
debug cell-hwic virt-con	Redirects the Nios II console driver messages to display in the Cisco IOS router console environment.

debug cellular messages gps

To display the GPS background activities for debugging purposes, use the **debug cellular messages gps** command in privileged EXEC mode.

debug cellular *unit* **messages gps**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following is a sample output for the **debug cellular messages gps** command:

```
router# debug cellular 0/1/0 messages gps
GPS debugging is on
```

Related Commands

Command	Description
cdma gps mode	Enables the GPS mode.
show cellular gps	Displays GPS statistics.

debug cellular messages nmea

To display NMEA background activities for debugging purposes, use the **debug cellular messages nmea** command in privileged EXEC mode.

debug cellular *unit* **messages nmea**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following is a sample output for the **debug cellular messages nmea** command:

```
router# debug cellular 0/1/0 messages nmea
```

Related Commands

Command	Description
cdma gps nmea	Enables or disables GPS NMEA stream state.

debug cellular messages sms

To display SMS background activities (for example, SMS downloading, deleting, and sending activities) for debugging purposes, use the **debug cellular messages sms** command in privileged EXEC mode.

debug cellular *unit* **messages sms**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following is a sample output for the **debug cellular messages sms** command:

```
router# debug cellular 0/1/0 messages sms
```

Related Commands

Command	Description
cdma sms archive path	Configures the FTP settings of the directory used to archive SMS messages.
cellular cdma profile select	Deletes SMS messages on the CDMA band.
cellular cdma sms send	Sends outgoing SMS messages on the CDMA band.
cellular cdma sms view	Displays all incoming messages stored on the SIM card.
show cellular sms	Displays SMS statistics.

show cellular all

To display all the modem information in one listing, use the **show cellular all** command in privileged EXEC mode.

show cellular *unit* **all**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the output is different for each.

Examples

The following example shows the output from the **show cellular all** command for slot 0, WIC slot 3, and port 0:

```
router# show cellular 0/0/0 all

Hardware Information
====================
Modem Firmware Version = p2813301
Modem Firmware built = 06-24-10
Hardware Version = MC5728V Rev 1.0
Electronic Serial Number (ESN) = 0x609938F3 [09610041587]
Preferred Roaming List (PRL) Version = 60667
PRI SKU ID = 535491
Current Modem Temperature = 30 degrees Celsius
Endpoint Port Map = 75

Profile Information
====================
Electronic Serial Number (ESN) = 0x609938F3 [09610041587]
Modem activated = YES

Account Information:
======================
Activation Date: 20100517
Phone Number (MDN) : 4088368172
Mobile Station Identifier (MSID) : 4088368172

Data Profile Info:
====================
```

```
Number of data profiles configurable : 5
Current active data profile : 1

Data Profile 0 Information
==================================
NAI (Network Access Identifier) = 609938F3@hcm.sprintpcs.com
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 68.28.15.12
Secondary Home Agent Address = 68.28.31.12

Data Profile 1 Information (Active)
==================================
NAI (Network Access Identifier) = cpciscosystemsin103@sprintpcs.com
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 255.255.255.255
Secondary Home Agent Address = 68.28.57.76

Data Profile 2 Information
==================================
NAI (Network Access Identifier) =
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 0.0.0.0
Secondary Home Agent Address = 0.0.0.0

Data Profile 3 Information
==================================
NAI (Network Access Identifier) =
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 0.0.0.0
Secondary Home Agent Address = 0.0.0.0

Data Profile 4 Information
==================================
NAI (Network Access Identifier) =
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 0.0.0.0
Secondary Home Agent Address = 0.0.0.0

Data Profile 5 Information
```

```
==================================
NAI (Network Access Identifier) =
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 0.0.0.0
Secondary Home Agent Address = 0.0.0.0


Data Connection Information
===========================
Phone number of outgoing call = #777
HDR AT State = Inactive, HDR Session State = Close
HDR Session Info:
    UATI (Hex) = 0000:0000:0000:0000:0000:0000:0000:0000
    Color Code = 0, RATI = 0x0
    Session duration = 0 msecs, Session start = 0 msecs
    Session end = 0 msecs, Authentication Status = Not authenticated
HDR DRC Value = 0, DRC Cover = 0, RRI = Pilot only
Current Transmitted = 163 bytes, Received = 324 bytes
Total Transmitted = 369 KB, Received = 9 KB
Current Call Status = DORMANT
Current Call Duration = 729 secs
Total Call Duration = 1986008 seconds
Current Call Type = AT Packet Call Dormant
Last Call Disconnect Reason = Client ended call
Last Connection Error = None
HDR DDTM (Data Dedicated Transmission Mode) Preference = Off
Mobile IP Error Code (RFC-2002) = 0 (Registration accepted)

Network Information
===================
Current Service = 1xRTT only
Current Roaming Status(1xRTT) = HOME, (HDR) = HOME
Current Idle Digital Mode = CDMA
Current System Identifier (SID) = 4183
Current Network Identifier (NID) = 87
Current Call Setup Mode = Mobile IP Preferred with SIP fallback
SIP Username = 0, SIP Password =
Serving Base Station Longitude = -121 deg -55 min -8 sec
Serving Base Station Latitude = 37 deg 25 min 22 sec
Current System Time = Wed Jan 12 14:50:8 2011

Radio Information
=================
1xRTT related info
------------------
Current RSSI = -82 dBm, ECIO = -4 dBm
Current Channel Number = 75
Current Channel State = Acquired
Current Band Class = Band Class 1

HDR (1xEVDO) related info
-------------------------
Current RSSI = -125 dBm, ECIO = -2 dBm
Current Channel Number = 65535
Current Band Class = Band Class 0
Sector ID (Hex) = 0000:0000:0000:0000:0000:0000:0000:0000
Subnet Mask = 0, Color Code = 0, PN Offset = 0
Rx gain control(Main) = Unavailable, Diversity = Unavailable
Tx total power = 0 dBm, Tx gain adjust = 0 dBm
```

```
Carrier to interference (C/I) ratio = 0

Modem Security Information
==========================
Modem PIN Security UNLOCKED
Power-up lock DISABLED

GPS Information
==========================

GPS Info
-------------
GPS State: GPS location error
GPS Mode Configured: standalone
Last Location Fix Error: Fix error [0xF]

SMS Information
===============
Incoming Message Information
----------------------------
SMS stored in modem = 0
SMS archived since booting up = 0
Total SMS deleted since booting up = 0
Storage records allocated = 99
Storage records used = 0
Number of callbacks triggered by SMS = 0
Number of successful archive since booting up = 0
Number of failed archive since booting up = 0

Outgoing Message Information
----------------------------
Total SMS sent successfully = 0
Total SMS send failure = 0
Number of outgoing SMS pending = 0
Number of successful archive since booting up = 0
Number of failed archive since booting up = 0
Last Outgoing SMS Status = SUCCESS
SMS-Send-Status:
  SMS ID =         0
  Error Class =  0x0
  Cause Code =   0x0

SMS Archive URL =

OMA DM Information
==================
Configuration info
------------------
DM Support = Enabled
Max DM account = 1, DM account in use = 1
DM account changed = No
Device Configuration:
        Client-Initiated  = Supported, Enabled
        Network-Initiated = Supported, Enabled
PRL Update:
        Client-Initiated  = Supported, Enabled
        Network-Initiated = Supported, Enabled
Firmware Update:
        Client-Initiated  = Supported, Enabled
        Network-Initiated = Supported, Enabled
Hands Free Activation:
        Device-Initiated  = Supported, Enabled
        Hands Free Activation attempted = Yes
```

```
DM session state info
---------------------
DM session state = Session not active
Last session type = Unspecified
Last session initiator = Unspecified
Last session UI mode = Unspecified
Last session result = Success
Last session updated = No

Network-Initiated alert info
----------------------------
NIA state = No NIA pending
Session type = Unspecified
Standard UI mode = Unspecified
Special UI mode = Unspecified
c1921_snmp#

CDMA

c1921_snmp#sh cellular 0/0/0 all
Hardware Information
====================
Modem Firmware Version = T0_2_5_2AP R263 CNS
Modem Firmware built = 11/12/10
Hardware Version = 1.0
International Mobile Subscriber Identity (IMSI) = 00112345678901
International Mobile Equipment Identity (IMEI) = 353567040022155
Integrated Circuit Card ID (ICCID) = 89600109080705906843
Mobile Subscriber International Subscriber
IDentity Number (MSISDN) =
Factory Serial Number (FSN) = CC3291001281001
Modem Status = Online
Current Modem Temperature = 38 deg C, State = Normal
PRI SKU ID = 9900198, SKU Rev. = 1.1

Profile Information
===================
Profile 1 = INACTIVE*
--------
PDP Type = IPv4
Access Point Name (APN) =
Authentication = None
Username: , Password:

 * - Default profile

Data Connection Information
===========================
Data Transmitted = 500 bytes, Received = 500 bytes
Profile 1, Packet Session Status = INACTIVE
        Inactivity Reason = PDP establish max timeout
Profile 2, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 3, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 4, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 5, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 6, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 7, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 8, Packet Session Status = INACTIVE
```

```
        Inactivity Reason = Normal inactivate state
Profile 9, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 10, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 11, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 12, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 13, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 14, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 15, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 16, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state

Network Information
==================
Current Service Status = Emergency Only, Service Error = None
Current Service = Invalid
Packet Service = None
Packet Session Status = Inactive
Current Roaming Status = Home
Network Selection Mode = Automatic
Country = USA, Network = AT&T
Mobile Country Code (MCC) = 310
Mobile Network Code (MNC) = 410
Location Area Code (LAC) = 6042
Routing Area Code (RAC) = 1
Cell ID = 31611
Primary Scrambling Code = 0
PLMN Selection = Automatic

Radio Information
=================
Radio power mode = ON
Current Band = CDMA 1900, Channel Number = 563
Current RSSI = -103 dBm
Band Selected = Auto
Number of nearby cells = 1
Cell 1
        Primary Scrambling Code = 0x106
        RSCP = -119 dBm, ECIO = -19 dBm


Modem Security Information
==========================
Card Holder Verification (CHV1) = Disabled
SIM Status = OK
SIM User Operation Required = None
Number of CHV1 Retries remaining = 3

GPS Information
==========================

GPS Info
-------------
GPS State: GPS disabled

SMS Information
===============
Incoming Message Information
```

```
----------------------------
SMS stored in modem = 2
SMS archived since booting up = 0
Total SMS deleted since booting up = 0
Storage records allocated = 10
Storage records used = 2
Number of callbacks triggered by SMS = 0
Number of successful archive since booting up = 0
Number of failed archive since booting up = 0

Outgoing Message Information
----------------------------
Total SMS sent successfully = 0
Total SMS send failure = 0
Number of outgoing SMS pending = 0
Number of successful archive since booting up = 0
Number of failed archive since booting up = 0
Last Outgoing SMS Status = SUCCESS
Copy-to-SIM Status =     0x0
Send-to-Network Status = 0x0
Report-Outgoing-Message-Number:
  Reference Number =     0
  Result Code =          0x0
  Diag Code =            0x0 0x0 0x0 0x0 0x0

SMS Archive URL =
```

Related Commands

Command	Description
show cellular security	Displays the modem lock state.
show controllers cellular	Displays EHWIC hardware- and driver-specific information.

show cellular connection

To display the current active connection state and data statistics, use the **show cellular connection** command in privileged EXEC mode.

show cellular *unit* **connection**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the output is different for each.

Examples

The following is a sample output for slot 0, WIC slot 0, and port 0 from the **show cellular connection** command:

```
router# show cellular 0/0/0 connection

Phone number of outgoing call =
HDR AT State = Idle, HDR Session State = Open
HDR Session Info:
    UATI (Hex) = 0084:0AC0:0000:0000:000A:05DC:A821:DCFC
    Color Code = 32, RATI = 0xFFFFFFFF
    Session duration = 0 msecs, Session start = 0 msecs
    Session end = 0 msecs, Authentication Status = Not authenticated
HDR DRC Value = 11, DRC Cover = 0, RRI = Pilot only
Current Transmitted = 0 bytes, Received = 0 bytes
Total Transmitted = 0 KB, Received = 0 KB
Current Call Status = DISCONNECTED
Current Call Duration = 30 secs
Total Call Duration = 4482879 seconds
Current Call State =
Last Call Disconnect Reason = Base station release (No reason)
Last Connection Error = None
HDR DDTM (Data Dedicated Transmission Mode) Preference = Off
Mobile IP Error Code (RFC-2002) = 0 (Registration accepted)
router#
```

Table 11 describes each output field.

Table 11 show cellular connection Field Descriptions of Sample Output for CDMA

Field	Description
Phone number of outgoing call	Shows the phone number of the data call dialed.
HDR AT State	Indicates the access terminal (AT) state. Shows as CONNECTED when CONNECT is received from the modem while dialing out. This is valid only for 1xEVDO.
HDR Session State	Indicates OPEN once the HDR session is established. This is valid only for 1xEVDO.
UATI	Unicast Access Terminal Identifier obtained by the modem or AT from the base station during session establishment.
Color Code	HDR session color code for the sector.
RATI	HDR Random Access Terminal Identifier used for opening a session.
Session Duration	HDR session duration in milliseconds.
Session Start	Phone uptime in units of milliseconds at session start.
Session End	Phone uptime in units of milliseconds at session end.
Authentication Status	Modem or AT authentication status with the base station.
HDR DRC Value	The data rate channel value specified by the AT. The AT uses DRC value to specify the requested transmission rate
DRC Cover	DRC cover value used by the AT to specify the transmitting sector.
RRI	Indicates the rate of the reverse traffic data channel.
Current Transmitted	Number of bytes transmitted by the modem to the base station. This will be cleared when the call is disconnected.
Current Received	Number of bytes received by the modem from the base station. This will be cleared when the call is disconnected.
Current call status	Current call status of the modem, such as CONNECTED, DISCONNECTED, DORMANT, CONNECTING, or ERROR.
Privacy Mode	Current privacy status of the call in progress.
Service Option	Service option for the call in progress.
Current Call Duration	Duration of the call in progress. A call status of DISCONNECTED displays the call duration of the last call.

Table 11 show cellular connection Field Descriptions of Sample Output for CDMA (continued)

Field	Description
Total Transmitted	Total number of kilobytes transmitted from the modem. This will be cleared by the **clear counters** command.
Total Received	Total number of kilobytes received by the modem. This will be cleared by the **clear counters** command.
Total Call Duration	Total duration of calls made from the modem. This will be updated when the current call in progress is disconnected.
Current Call State	Indicates the type of call made.
Last Call Disconnect Reason	Indicates why the last call was disconnected.
Last Connection Error	Indicates the error code if the call status indicates an error.
Mobile IP Error Code	Indicates the error code in accordance with RFC-2002 if the call is a mobile IP call. **Note** The current call setup mode is in Simple IP only. In this case, **show cellular connection** will not display Mobile IP Error Code. Mobile IP error code is displayed when call setup mode is either "Mobile IP only" mode or "Mobile IP Preferred with SIP fallback" mode.

Related Commands

Command	Description
show cellular hardware	Displays the cellular modem hardware information.
show cellular network	Displays the cellular network (base station) information.
show cellular profile	Displays the cellular profile information.
show cellular security	Displays the modem lock state.
show controllers cellular	Displays EHWIC hardware- and driver-specific information.

show cellular gps

To display GPS statistics, use the **show cellular gps** command in privileged EXEC mode.

show cellular *unit* **gps**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example displays the GPS statistics:

```
router# show cellular 0/0/0 gps
```

Related Commands

Command	Description
cdma gps mode	Enables the GPS mode.
debug cellular messages gps	Displays the GPS background activities for debugging purposes.

show cellular hardware

To display the cellular modem hardware information, use the **show cellular hardware** command in privileged EXEC mode.

show cellular *unit* **hardware**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.
15.1(3)T1	This command was modified to add a new line (Endpoint Port Map).
15.3(2)T	This command was updated for CDMA SKUs to display carrier ID and name

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the output is different for each.

Examples

The following is a sample output for slot 0, WIC slot 1, and port 0:

```
router# show cellular 0/0/0 hardware
Modem Firmware Version = p2813301
Modem Firmware built = 06-24-10
Hardware Version = MC5728V Rev 1.0
Electronic Serial Number (ESN) = 0x60E62C87 [09615084679]
Preferred Roaming List (PRL) Version = 10
PRI SKU ID = 535479
Carrier ID = 19 Carrier Name = Reliance
Current Modem Temperature = 30 degrees Celsius
Endpoint Port Map = 75
router#

router# show cellular 0/1/0 hardware
Modem Firmware Version = p2813301
Modem Firmware built = 06-24-10
Hardware Version = MC5728V Rev 1.0
Electronic Serial Number (ESN) = 0x60E62431 [09615082545]
Preferred Roaming List (PRL) Version = 10
PRI SKU ID = 535479
Carrier ID = 29 Carrier Name = Tata
Current Modem Temperature = 30 degrees Celsius
Endpoint Port Map = 75
router#
```

Related Commands

Command	Description
show cellular security	Displays the modem lock state.
show controllers cellular	Displays EHWIC hardware- and driver-specific information.

show cellular network

To display information about the carrier network and service, use the **show cellular network** command in privileged EXEC mode.

show cellular *unit* **network**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the outputs differ.

Examples

The following is a sample output for slot 0, WIC slot 0, and port 0:

```
router# show cellular 0/0/0 network

Current Service = 1xEV-DO (Rev A) and 1xRTT
Current Roaming Status(1xRTT) = HOME, (HDR) = HOME
Current Idle Digital Mode = HDR
Current System Identifier (SID) = 4183
Current Network Identifier (NID) = 87
Current Call Setup Mode = Mobile IP only
Serving Base Station Longitude = 0 deg 0 min 0 sec
Serving Base Station Latitude = 0 deg 0 min 0 sec
Current System Time = Tue Feb 6 15:16:9 2007
```

Table 12 describes the significant fields shown in this output.

Table 12 show cellular network Field Descriptions

Field	Description
Current Service	Service attached by the modem.
Current Roaming Status	Indicates whether the modem is in the home network or roaming.
Current Idle Digital Mode	Idle mode of the modem.
Current System Identifier	SID received by the modem (applicable only for 1xRTT).

Table 12 show cellular network Field Descriptions (continued)

Field	Description
Current Network Identifier	NID received by the modem (applicable only for 1xRTT).
Current BSS Longitude/Latitude	Geographic location of the BSS (if this information is received from the BSS).
Current System Time	System time received from the base station.

Related Commands

Command	Description
show cellular security	Displays the modem lock state.
show controllers cellular	Displays EHWIC hardware- and driver-specific information.

show cellular profile

To display the cellular profile information, use the **show cellular profile** command in privileged EXEC mode.

show cellular *unit* **profile**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the output is different for each.

Examples

The following is a sample output for the **show cellular profile** command:

```
router# show cellular 0/0/0 profile

Electronic Serial Number (ESN) = 0x6032688F
Modem activated = YES

Account Information:
=====================
Activation Date: Not available
Phone Number (MDN) : 1234567890
Mobile Station Identifier (MSID) : 1234567890

Data Profile Info:
====================
Number of data profiles configured : 2
Current active data profile : 1

Data Profile 0 Information
==================================
NAI (Network Access Identifier) = 6032688F@hcm.sprintpcs.com
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 68.28.15.12
Secondary Home Agent Address = 68.28.31.12
```

```
Data Profile 1 Information (Active)
==================================
NAI (Network Access Identifier) = productmarketing432@sprintpcs.com
MN-HA SS = Set
MN-HA SPI = 1234
MN-AAA SS = Set
MN-AAA SPI = 1234
Reverse Tunneling Preference = Set
Home Address = 0.0.0.0
Primary Home Agent Address = 68.28.81.76
Secondary Home Agent Address = 68.28.89.76
```

"*" Indicates the default profile.

Table 13 describes the output fields from the command.

Table 13 show cellular profile Field Descriptions

Field	Description
Electronic Serial Number	Unique serial number for the CDMA modem.
Modem Activated	Indicates the activation status of the modem. Yes indicates that the modem is activated on the carrier network.
Data Profile	Data profile consists of the mobile IP (MIP) settings for the data connection. These settings are populated on the modem by the network using OTASP/IOTA.
ProvDate	Date the modem was provisioned, in *yyyy/mm/dd* format.
MDN	Mobile Directory Number assigned to the modem by the carrier during provisioning.
MIN	Mobile Identity Number assigned to the modem by the carrier during provisioning

show cellular radio

To display the cellular modem radio statistics, use the **show cellular radio** command in privileged EXEC mode.

show cellular *unit* **radio** {**history** {**all** | **per-hour** | **per-min** | **per-sec**}}

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.
history	Displays the RSSI history.
all	Complete RSSI history.
per-hour	Per-hour RSSI history.
per-min	Per-minute RSSI history.
per-sec	Per-second RSSI history.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the output is different for each.

Examples

The following is a sample output for the **show cellular radio** command:

```
router# show cellular 0/0/0 radio
1xRTT related info
------------------
Current RSSI = -95 dBm, ECIO = -6 dBm
Current Channel Number = 50
Current Channel State = Acquired
Current Band Class = Band Class 1

HDR (1xEVDO) related info
-------------------------
Current RSSI = -88 dBm, ECIO = -2 dBm
Current Channel Number = 25
Current Band Class = Band Class 1
Sector ID (Hex) = 0084:0AC0:0000:0000:000A:05DC:A801:1202
Subnet Mask = 104, Color Code = 32, PN Offset = 240
Rx gain control(Main) = 0 dBm, Diversity = Unavailable
Tx total power = -2 dBm, Tx gain adjust = 1536 dBm
Carrier to interference (C/I) ratio = 2
```

Table 14 describes the significant fields shown in this output.

Table 14 show cellular radio Field Descriptions

Field	Description
Current RSSI	Current radio signal strength in dbm (-125 dbm indicates no signal).
Current ECIO	Current energy per chip (ECIO) in dbm.
Current Channel Number	Current channel number to which the modem is attached to the base station.
Current Channel State	Indicates whether the modem is scanning or has acquired the channel.
Current Band Class	Current band class to which the modem is attached.
Sector ID	Sector ID of the base station to which the modem is attached.
Subnet Mask	Subnet mask of the sector.
Color Code	Color code of the sector.
PN Offset	PN offset for the sector.
Rx Gain Control	Received gain control for the modem.
Tx Total Power	Transmitted power.

Related Commands

Command	Description
show cellular all	Displays the consolidated information about the modem.
show controllers cellular	Displays EHWIC-hardware and driver-specific information.

show cellular security

To display the SIM status and modem lock state, use the **show cellular security** command in privileged EXEC mode.

show cellular *unit* **security**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

The command usage is the same for Global System for Mobile Communications (GSM) and code division multiple access (CDMA), although the output is different for each.

Examples

The following is a sample output for the **show cellular security** command:

```
router# show cellular 0/0/0 security
Modem PIN Security UNLOCKED
Power-up lock DISABLED
```

Table 15 describes the output for this command.

Table 15 show cellular security Field Descriptions

Field	Description
Modem PIN Security	If the modem is locked, you cannot make calls without unlocking.
Power-up Lock	Shows whether the modem will be locked on power-up.

show cellular sms

To display SMS statistics, including the number of incoming and outgoing messages, use the **show cellular sms** command in privileged EXEC mode.

show cellular *unit* **sms**

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.1(3)T	This command was introduced.

Examples

The following example displays the SMS statistics for the **show cellular sms** command:

```
router# show cellular 0/0/0 sms
c1941#show cellular 0/0/0 sms
SMS Service is not available
Number of outgoing SMS pending = 0
c1941#show cellular 0/1/0 sms
Incoming Message Information
----------------------------
SMS stored in modem = 5
SMS archived since booting up = 0
Total SMS deleted since booting up = 0
Storage records allocated = 99
Storage records used = 5
Number of callbacks triggered by SMS = 0
Number of successful archive since booting up = 0
Number of failed archive since booting up = 0
Outgoing Message Information
----------------------------
Total SMS sent successfully = 0
Total SMS send failure = 0
Number of outgoing SMS pending = 0
Number of successful archive since booting up = 0
Number of failed archive since booting up = 0
Last Outgoing SMS Status = SUCCESS
SMS-Send-Status:
  Error Class =  0x0
  Cause Code =   0x0
SMS Archive URL = ftp://username:password@192.168.1.3/SMS_archive
```

Related Commands

Command	Description
cellular cdma profile select	Deletes SMS messages on the CDMA band.
cellular cdma sms send	Sends outgoing SMS messages on the CDMA band.
cellular cdma sms view	Displays all incoming messages stored on the SIM card.

show controllers cellular

To display high-speed WAN interface card (EHWIC) hardware and driver-specific information, use the **show controllers cellular** command in privilege EXEC mode.

show controllers cellular *unit*

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privilege EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

Use this command to capture the output for debugging or troubleshooting purposes only.

Related Commands

Command	Description
show interfaces cellular	Displays statistics for the cellular interfaces.
show run interface cellular	Displays the current running configuration for the cellular interface.

show interfaces cellular

To display statistics for the cellular interface, use the **show interfaces cellular** command in privileged EXEC mode.

show interfaces cellular *unit*

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Usage Guidelines

When you enter this command, encapsulation should be PPP and all signals, such as DCD, DSR, DTR, RTS, and CTS, should be up during normal operation.

Examples

The following example shows the output for the **show interfaces cellular** command:

```
router# show int cellular 0/0/0
Cellular0/0/0 is up (spoofing), line protocol is up (spoofing)
  Hardware is EVDO Rev A/Rel 0/1xRTT-800/1900MHz / SP
  Internet address will be negotiated using IPCP
  MTU 1500 bytes, BW 9 Kbit, DLY 100000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, LCP Closed, loopback not set
  Keepalive not set
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/16 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 6 kilobits/sec
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

Related Commands

Command	Description
show controllers cellular	Displays EHWIC hardware- and driver-specific information.
show run interface cellular	Displays the current running configuration for the cellular interface.

show run interface cellular

To see the current running configuration for the cellular interface, use the **show run interface cellular** command in privileged EXEC mode.

show run interface cellular *unit*

Syntax Description

unit	(EHWIC) Router slot, WIC slot, and port separated by slashes (for example, 0/1/0). (Fixed platform) The number 0.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.4(11)XV	This command was introduced.
12.4(15)T	This command was integrated into Cisco IOS Release 12.4(15)T.

Examples

The following example shows the output for the **show run interface cellular** command:

```
router# show running-config interface cellular 0/0/0
interface Cellular0/0/0
 ip address negotiated
 ip access-group 10 out
 ip nat outside
 ip virtual-reassembly
 encapsulation ppp
 no ip mroute-cache
 load-interval 30
 dialer in-band
 dialer idle-timeout 2147483
 dialer string cdma
 dialer-group 2
 async mode interactive
 no peer default ip address
 fair-queue
 ppp ipcp dns request
 routing dynamic
end router#
```

Related Commands

Command	Description
show controllers cellular	Displays EHWIC hardware- and driver-specific information.
show interfaces cellular	Displays statistics for the cellular interfaces.

Troubleshooting

This section provides the necessary background information and resources available for troubleshooting Cisco EHWIC-3G-EVDO issues.

- Verifying Data Call Setup, page 129
- Checking Signal Strength, page 129
- Verifying Service Availability, page 130
- Successful Call Setup, page 131
- Modem Troubleshooting Using the Diagnostic Port, page 133

Verifying Data Call Setup

To verify the data call setup, follow these steps:

Step 1 After you create a modem data profile using the **cellular profile create** command and configuring DDR on the cellular interface, send a ping from the router to a host across the wireless network.

Step 2 If the ping fails, debug the failure using the following **debug** and **show** commands:

- **debug chat**
- **debug dialer**
- **debug ppp negotiation**
- **show cellular all**
- **show controller cellular**
- **show interface cellular**
- **show running-config**
- **show ip route**

Step 3 Save the output from these commands and contact your system administrator.

Checking Signal Strength

If the Received Signal Strength Indication (RSSI) level is very low (for example, if it is less than -110 dBm), follow these steps:

Step 1 Check the antenna connection. Make sure the TNC connector is correctly threaded and tightened.

Step 2 If you are using a remote antenna, move the antenna cradle and check if the RSSI has improved.

Step 3 Contact your wireless service provider to verify if there is service availability in your area.

Verifying Service Availability

The following is a sample output for the **show cellular all** command for a scenario where the antenna is disconnected and a modem data profile has not been created. The errors in this case have been highlighted with >>>>>>>:

```
3825_CDMA_3# show cellular 0/3/0 all
Load for five secs: 0%/0%; one minute: 0%; five minutes: 1%
Time source is hardware calendar, 19:40:43.239 UTC Wed Nov 8 2006

Hardware Information
====================
Modem Firmware Version = H1_0_0_7MCAP G:/WS/
Modem Firmware built = 10/26/06
Hardware Version = 1.0
International Mobile Subscriber Identity (IMSI) = <specific sim number>
International Mobile Equipment Identity (IMEI) = <specific modem number>
Factory Serial Number (FSN) = X2819460388100D
Modem Status = Online
Current Modem Temperature = 38 deg C, State = Normal

Profile Information
====================
 * - Default profile >>>>>>>> no profile here.

Data Connection Information
============================

Profile 1, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 2, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 3, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 4, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 5, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 6, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 7, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 8, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 9, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 10, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 11, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 12, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 13, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 14, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 15, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state
Profile 16, Packet Session Status = INACTIVE
        Inactivity Reason = Normal inactivate state


Network Information
```

```
==================
Current Service Status = No service, Service Error = None    >>>>>>> no service means not
connected to the network.
Current Service = Combined
Packet Service = None
Packet Session Status = Inactive
Current Roaming Status = Home
Network Selection Mode = Automatic
Country = USA, Network = Cinglr
Mobile Country Code (MCC) = 310
Mobile Network Code (MNC) = 380
Location Area Code (LAC) = 6042
Routing Area Code (RAC) = 255
Cell ID = 0
Primary Scrambling Code = 0
PLMN Selection = Automatic

Radio Information
=================
Current Band = None, Channel Number = 0
Current RSSI = -110 dBm        >>>>>>> either no antenna, or bad antenna or out of
network.

Modem Security Information
==========================
Card Holder Verification (CHV1) = Disabled
SIM Status = OK
SIM User Operation Required = None
Number of Retries remaining = 3
```

Successful Call Setup

The following is a sample output when a call is set up using a CHAT script. It shows a received IP address from the network. Call setup is successful and data path is open.

To troubleshoot the call setup, enable these **debug** commands:

- **debug modem**
- **debug chat**
- **debug ppp negotiation**
- **debug ppp event**
- **debug ppp error**

```
3825_CDMA_3#
Nov  8 20:04:42.295: CHAT0/3/0: Attempting async line dialer script
Nov  8 20:04:42.295: CHAT0/3/0: Dialing using Modem script: <carrier> & System script:
none
Nov  8 20:04:42.299: CHAT0/3/0: process started
Nov  8 20:04:42.299: CHAT0/3/0: Asserting DTR
Nov  8 20:04:42.299: CHAT0/3/0: Chat script <carrier> started        >>>>> chat script
invoked
Nov  8 20:04:42.299: CHAT0/3/0: Sending string: atdt*98*1#
Nov  8 20:04:42.299: CHAT0/3/0: Expecting string: CONNECT
Nov  8 20:04:42.343: CHAT0/3/0: Completed match for expect: CONNECT
Nov  8 20:04:42.343: CHAT0/3/0: Chat script <carrier> finished, status = Success  >>>>
successful communication with modem
Nov  8 20:04:42.395: TTY0/3/0: no timer type 1 to destroy
Nov  8 20:04:42.395: TTY0/3/0: no timer type 0 to destroy
```

```
Nov  8 20:04:42.395: TTY0/3/0: no timer type 2 to destroy
Nov  8 20:04:44.395: %LINK-3-UPDOWN: Interface Cellular0/3/0, changed state to up
Nov  8 20:04:44.395: Ce0/3/0 PPP: Using dialer call direction
Nov  8 20:04:44.395: Ce0/3/0 PPP: Treating connection as a callout
Nov  8 20:04:44.395: Ce0/3/0 PPP: Session handle[7E000089] Session id[46]
Nov  8 20:04:44.395: Ce0/3/0 PPP: Phase is ESTABLISHING, Active Open
Nov  8 20:04:44.395: Ce0/3/0 PPP: No remote authentication for call-out
Nov  8 20:04:44.395: Ce0/3/0 LCP: O CONFREQ [Closed] id 75 len 16
Nov  8 20:04:44.395: Ce0/3/0 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Nov  8 20:04:44.395: Ce0/3/0 LCP:    MagicNumber 0x179E8E46 (0x0506179E8E46)
Nov  8 20:04:44.395: Ce0/3/0 LCP: I CONFREQ [REQsent] id 83 len 25
Nov  8 20:04:44.395: Ce0/3/0 LCP:    ACCM 0x00000000 (0x020600000000)
Nov  8 20:04:44.395: Ce0/3/0 LCP:    AuthProto CHAP (0x0305C22305)
Nov  8 20:04:44.395: Ce0/3/0 LCP:    MagicNumber 0x374C7C61 (0x0506374C7C61)
Nov  8 20:04:44.395: Ce0/3/0 LCP:    PFC (0x0702)
Nov  8 20:04:44.395: Ce0/3/0 LCP:    ACFC (0x0802)
Nov  8 20:04:44.395: Ce0/3/0 LCP: O CONFREJ [REQsent] id 83 len 8
Nov  8 20:04:44.395: Ce0/3/0 LCP:    PFC (0x0702)
Nov  8 20:04:44.395: Ce0/3/0 LCP:    ACFC (0x0802)
Nov  8 20:04:44.399: Ce0/3/0 LCP: I CONFACK [REQsent] id 75 len 16
Nov  8 20:04:44.399: Ce0/3/0 LCP:    ACCM 0x000A0000 (0x0206000A0000)
Nov  8 20:04:44.399: Ce0/3/0 LCP:    MagicNumber 0x179E8E46 (0x0506179E8E46)
Nov  8 20:04:44.399: Ce0/3/0 LCP: I CONFREQ [ACKrcvd] id 84 len 21
Nov  8 20:04:44.399: Ce0/3/0 LCP:    ACCM 0x00000000 (0x020600000000)
Nov  8 20:04:44.399: Ce0/3/0 LCP:    AuthProto CHAP (0x0305C22305)
Nov  8 20:04:44.399: Ce0/3/0 LCP:    MagicNumber 0x374C7C61 (0x0506374C7C61)
Nov  8 20:04:44.399: Ce0/3/0 LCP: O CONFACK [ACKrcvd] id 84 len 21
Nov  8 20:04:44.399: Ce0/3/0 LCP:    ACCM 0x00000000 (0x020600000000)
Nov  8 20:04:44.399: Ce0/3/0 LCP:    AuthProto CHAP (0x0305C22305)
Nov  8 20:04:44.399: Ce0/3/0 LCP:    MagicNumber 0x374C7C61 (0x0506374C7C61)
Nov  8 20:04:44.399: Ce0/3/0 LCP: State is Open
Nov  8 20:04:44.399: Ce0/3/0 PPP: Phase is AUTHENTICATING, by the peer
Nov  8 20:04:44.403: Ce0/3/0 CHAP: I CHALLENGE id 1 len 35 from "UMTS_CHAP_SRVR"
Nov  8 20:04:44.403: Ce0/3/0 CHAP: Using hostname from interface CHAP
Nov  8 20:04:44.403: Ce0/3/0 CHAP: Using password from interface CHAP
Nov  8 20:04:44.403: Ce0/3/0 CHAP: O RESPONSE id 1 len 40 from "<username configured on
the cellular interface>"
Nov  8 20:04:44.407: Ce0/3/0 CHAP: I SUCCESS id 1 len 4
Nov  8 20:04:44.407: Ce0/3/0 PPP: Phase is FORWARDING, Attempting Forward
Nov  8 20:04:44.407: Ce0/3/0 PPP: Phase is ESTABLISHING, Finish LCP
Nov  8 20:04:44.407: Ce0/3/0 PPP: Phase is UP

>>>>> pap/chap succeeded

Nov  8 20:04:44.407: Ce0/3/0 IPCP: O CONFREQ [Closed] id 1 len 22
Nov  8 20:04:44.407: Ce0/3/0 IPCP:    Address 0.0.0.0 (0x030600000000)
Nov  8 20:04:44.407: Ce0/3/0 IPCP:    PrimaryDNS 0.0.0.0 (0x810600000000)
Nov  8 20:04:44.407: Ce0/3/0 IPCP:    SecondaryDNS 0.0.0.0 (0x830600000000)
Nov  8 20:04:44.407: Ce0/3/0 PPP: Process pending ncp packets
Nov  8 20:04:45.411: Ce0/3/0 IPCP: I CONFNAK [REQsent] id 1 len 16
Nov  8 20:04:45.411: Ce0/3/0 IPCP:    PrimaryDNS 10.11.12.13 (0x81060A0B0C0D)
Nov  8 20:04:45.411: Ce0/3/0 IPCP:    SecondaryDNS 10.11.12.14 (0x83060A0B0C0E)
Nov  8 20:04:45.411: Ce0/3/0 IPCP: O CONFREQ [REQsent] id 2 len 22
Nov  8 20:04:45.411: Ce0/3/0 IPCP:    Address 0.0.0.0 (0x030600000000)
Nov  8 20:04:45.411: Ce0/3/0 IPCP:    PrimaryDNS 10.11.12.13 (0x81060A0B0C0D)
Nov  8 20:04:45.411: Ce0/3/0 IPCP:    SecondaryDNS 10.11.12.14 (0x83060A0B0C0E)
Nov  8 20:04:45.459: Ce0/3/0 IPCP: I CONFREQ [REQsent] id 25 len 4
Nov  8 20:04:45.459: Ce0/3/0 IPCP: O CONFACK [REQsent] id 25 len 4
Nov  8 20:04:45.459: Ce0/3/0 IPCP: I CONFNAK [ACKsent] id 2 len 22
Nov  8 20:04:45.459: Ce0/3/0 IPCP:    Address 166.138.186.119 (0x0306A68ABA77)
Nov  8 20:04:45.459: Ce0/3/0 IPCP:    PrimaryDNS 66.102.163.231 (0x81064266A3E7)
Nov  8 20:04:45.459: Ce0/3/0 IPCP:    SecondaryDNS 66.102.163.232 (0x83064266A3E8)
Nov  8 20:04:45.459: Ce0/3/0 IPCP: O CONFREQ [ACKsent] id 3 len 22
Nov  8 20:04:45.459: Ce0/3/0 IPCP:    Address 166.138.186.119 (0x0306A68ABA77)
```

```
Nov  8 20:04:45.459: Ce0/3/0 IPCP:    PrimaryDNS 66.102.163.231 (0x81064266A3E7)
Nov  8 20:04:45.459: Ce0/3/0 IPCP:    SecondaryDNS 66.102.163.232 (0x83064266A3E8)
Nov  8 20:04:45.463: Ce0/3/0 IPCP: I CONFACK [ACKsent] id 3 len 22
Nov  8 20:04:45.463: Ce0/3/0 IPCP:    Address 166.138.186.119 (0x0306A68ABA77)
Nov  8 20:04:45.463: Ce0/3/0 IPCP:    PrimaryDNS 66.102.163.231 (0x81064266A3E7)
Nov  8 20:04:45.463: Ce0/3/0 IPCP:    SecondaryDNS 66.102.163.232 (0x83064266A3E8)
Nov  8 20:04:45.463: Ce0/3/0 IPCP: State is Open
Nov  8 20:04:45.463: Ce0/3/0 IPCP: Install negotiated IP interface address 166.138.186.119
```

Modem Troubleshooting Using the Diagnostic Port

The RJ-45 port on the faceplate of the 3G EHWIC provides access to the debug port on the Sierra Wireless modem. By connecting an industry-standard diagnostic tool like Qualcomm CAIT/QXDM or Spirent UDM to this port, you can perform radio-level diagnostics and traffic monitoring on the modem.

Use the following test commands to enable/disable the DM port:

```
router# test cell-hwic 0/1/0 dm-port local {on | off | speed}
router# test cell-hwic 0/1/0 dm-port remote {on | off}
```

For example, to enable the DM port, use one of these commands:

```
router# test cell-hwic 0/1/0 dm-port local on
router# test cell-hwic 0/1/0 dm-port remote on
```

The cable used to connect the PC/Laptop running the diagnostic tool is the standard Cisco router console cable (RJ-45 to DB-9).

Note To enable test commands, you must enter the **service internal** command in global configuration mode.

Additional References

Related Documents

Related Topic	Document Title
Cisco 880 Series Integrated Service Router configuration	• *Configuring Cisco EHWIC and 880G for 3.7G (HSPA+)/3.5G (HSPA)* • *Cisco 880 Series Integrated Services Router Software Configuration Guide*
Cisco 800 Series Integrated Service Router installation	• *Cisco 860 Series, Cisco 880 Series, and Cisco 890 Series Integrated Services Routers Hardware Installation Guide*
Release notes	• *Release Notes for Cisco EHWIC and 880G for 3G (EVDO Rev A)* • *Release Notes for EHWIC and 880G for 3.7G(HSPA+)/3.5G(HSPA)*

Standards

Standard	Title
IEEE 802.11n-2009	*IEEE Standard for Information Technology—Local and metropolitan area networks—Specific requirements—Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications—Ammendment 5: Enhancements for Higher Throughput*

MIBs

MIB	MIBs Link
• CISCO-ENTITY-VENDORTYPE-OID-MIB • CISCO-PRODUCTS-MIB • 3G WWAN MIB = CISCO-WAN-3G-MIB • OLD-CISCO-CHASSIS-MIB	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported, and support for existing RFCs has not been modified.	—

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

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