Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x, and PCEX-3G-CDMA-x)

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The Cisco 880G series integrated services routers (Cisco ISRs) provide Internet, VPN, voice, data, and backup capability to corporate teleworkers and remote and small offices of fewer than 20 users. These fixed routers are capable of bridging and multiprotocol routing between LAN and WAN ports, and provide advanced features such as antivirus protection.

The Third Generation (3G) Wireless High-Speed WAN Interface Card (HWIC) is a multiband, multiservice WAN card for use over CDMA Radio Access Networks (RAN). It is used as the primary WAN connectivity and as a backup for critical applications. The 3G HWIC can also be used as the primary WAN connection.

Both the fixed and the modular 3G routers can be used as the primary WAN connectivity and as a backup for critical applications, and can also be used as the primary WAN connection.

It is supported on the following modular Cisco ISRs:

- Cisco 1841
- Cisco 1861
- Cisco 2800 series
- Cisco 3800 series
- Cisco 1900
- Cisco 2900
- Cisco 3900
- Cisco 880
The 3G wireless Modular and Fixed Cisco ISR provides the following functionality:

- Broadband WAN connectivity using high speed cellular data technology
- Support for the following technologies:
  - CDMA2000 Evolution-Data Optimized (EVDO) Revision (Rev) A
  - CDMA2000 EVDO Rev 0
  - CDMA Single channel Radio Transmission Technology (1xRTT)
- 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) cable length from 10 ft to 75 ft
- IOS-based Mobile IP including network mobility (NEMO)
- Supports over-the-air service provisioning (OTASP), Internet over-the-air (IOTA) data profile provisioning, and Open Mobile Alliance device management (OMA-DM).
- Multiple product SKUs for multiple CDMA carriers
- Multiple external antenna options
- Support for diversity antenna
- Static and dynamic IP addressing
- Modem-based support for mobile IP
- Cellular interface based on the async interface in Cisco IOS
- Mobile IP profile management for CDMA
- 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)
- Cellular WAN management information base (MIB)
- Diagnostic and monitoring capability
- Complete Cisco IOS feature capability

The Cisco 3G wireless Modular and Fixed Cisco ISR provides the following software functionality:

- Modem activation—You can activate the modem either by using Cisco IOS commands either manually or by using over-the-air service provisioning (OTASP), Internet over-the-air (IOTA) data profile provisioning or the device management protocol specified by OMA-DM.
- Modem management—You can access modem software and hardware information, radio and network status, and data profile information by using Cisco IOS commands and SNMP MIBs.
- 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)—The 3G Modular and Fixed Cisco ISR 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 Modular and Fixed Cisco ISR tears down the fallback-mode connection when the primary connection is available.

• Automatic teardown—After a configurable timeout, the 3G Modular and Fixed Cisco ISR automatically tears down a connection if there has been no activity.

• Autodetect—The 3G Modular and Fixed Cisco ISR automatically detects and uses the best available service.

• Firmware upgrade—You can upgrade the firmware on the modem by using Cisco IOS commands.

• 3G HWIC support on Cisco Integrated Services Router (ISR) platforms, namely Cisco 1841, Cisco 1861, Cisco 2801, Cisco 2811, Cisco 2821, Cisco 2851, Cisco 3825, and Cisco 3845.

• Comprehensive Cisco IOS MIB support including Interface (IF) MIBs and Entity MIBs.

• 3G cellular MIB support.

Table 1 shows the SKU and the frequencies supported by the 3G wireless WAN HWICs.

Table 1  
SKU Description and Supported Frequencies

<table>
<thead>
<tr>
<th>SKU Number</th>
<th>Description</th>
<th>Region</th>
<th>Frequency Bands</th>
</tr>
</thead>
<tbody>
<tr>
<td>HWIC-3G-CDMA-x</td>
<td>EVDO Rev A/Rev 0/1xRTT, where x is an initial for a specific carrier</td>
<td>US</td>
<td>800/1900MHz</td>
</tr>
<tr>
<td>HWIC-3G-CDMA</td>
<td>Generic SKU for worldwide CDMA network</td>
<td>Worldwide</td>
<td>800/1900MHz</td>
</tr>
<tr>
<td>PCEX-3G-CDMA-x</td>
<td>Cisco 880G Series 3G Wireless Integrated Services Router, where x is an initial for a specific carrier.</td>
<td>North America</td>
<td>800/1900 MHz</td>
</tr>
</tbody>
</table>

Figure 1 shows the front panel of the HWIC-3G-CDMA-x.

Figure 1  
Front Panel of HWIC-3G-CDMA-x

| 1 | Mounting Screws |
| 2 | Diagnostic Port |
| 3 | Main Antenna Connector |
| 4 | LEDs |
| 5 | Diversity Antenna Connector |
The diagnostic port is not required for normal operation. It is used only for advanced radio diagnostics. Please refer to “Modem Troubleshooting Using the Diagnostic Port” section on page 104 for details on enabling this port and the diagnostic tools that are supported.

Table 2 explains each of the LEDs with their functionality and the different states. The LEDs provide a visual indication of your available services. Please refer to Chapter 13 in the Cisco Interface Cards Hardware Installation Guide for details on hardware installation.

### Table 2 3G Wireless HWIC (CDMA) LED Descriptions

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSSI</td>
<td>Off: Low RSSI (-100 dBm).</td>
</tr>
<tr>
<td></td>
<td>Slow Green Blink: Low or medium RSSI (-99 to -90 dBm).</td>
</tr>
<tr>
<td></td>
<td>Fast Green Blink: Medium RSSI (-89 to -70 dBm).</td>
</tr>
<tr>
<td></td>
<td>Solid Green: High RSSI (-69 dBm or higher).</td>
</tr>
<tr>
<td></td>
<td>Solid Yellow: No service.</td>
</tr>
<tr>
<td>WWAN</td>
<td>Off: HWIC in reset mode or not powered.</td>
</tr>
<tr>
<td></td>
<td>Slow blink: Searching for service.</td>
</tr>
<tr>
<td></td>
<td>Solid Green: Active service; no traffic detected.</td>
</tr>
<tr>
<td></td>
<td>Fast Blink: Active service, and traffic detected proportional to blink rate.</td>
</tr>
<tr>
<td>1xRTT</td>
<td>1xRTT is the active service.</td>
</tr>
<tr>
<td>EVDO</td>
<td>1xEVDO is the active service.</td>
</tr>
</tbody>
</table>

**Note** Both 1xRTT and EVDO Off: No service is active.

**Note** If the RSSI LED is solid yellow, it means that there is no service.

**Note** Active service means the currently available service. Your 3G WAN wireless HWIC automatically selects the best available connection.

### Feature History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This feature was introduced. (This image is not supported any longer.)</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This feature was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td>12.4(22)YB1</td>
<td>This feature was revised.</td>
</tr>
<tr>
<td>15.1(1)T</td>
<td>This feature was integrated into Cisco IOS Release 15.1(1)T</td>
</tr>
</tbody>
</table>
PCEX-3G-CDMA-x

Figure 2 shows the front panel of the PCEX-3G-CDMA.

<table>
<thead>
<tr>
<th>1</th>
<th>LEDS</th>
<th>3</th>
<th>USB port</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3G express card slot—Supports third-party¹ 3G card (Cisco 88xG models only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. See the Cisco 880 Series Integrated Services Routers data sheet for supported vendors.

Table 3 lists the LEDs and describes their functionality and different states. The LEDs provide a visual indication of your available services. Please see the Cisco 880 Series ISR Hardware Installation Guide for details on hardware installation.

### Table 3 LED Description for PCEX-3G-HSPA-x

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Description</th>
<th>880 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G¹ WWAN²</td>
<td>Green</td>
<td>On—Service is established.</td>
<td>3G models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slow Blinking—Searching for service.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fast Blinking—Data is either being received or being transmitted.</td>
<td></td>
</tr>
<tr>
<td>3G RSSI³</td>
<td>Green</td>
<td>Off—Low signal strength (lower than -100 dBm).</td>
<td>3G models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>On—High RSSI (-69 dBm or higher).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slow Blinking—Low or medium RSSI (-99 to -90 dBm).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fast Blinking—Medium RSSI (-89 to -70 dBm).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amber</td>
<td>On—No service.</td>
<td>3G models</td>
</tr>
</tbody>
</table>

1. See the Cisco 880 Series Integrated Services Routers data sheet for supported vendors.
The PCEX-3G-CDMA supports the AC501 and the AC880E modem. Table 4 shows the LED information for the LEDs located on the modem.

**Table 4  Modem LED Descriptions**

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
<th>880 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>Indicates one of the following states:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The modem has detected or is connected to a 2G or 3G network.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The modem is not inserted in the PC.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The computer is off or in “suspend and resume mode”.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The modem has been turned off using Watcher (Tools &gt; Turn Radio Off) or another connection client.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solid Blue: The power is on, the modem is working normally, and the firmware is not being updated.</td>
<td>3G models</td>
</tr>
<tr>
<td></td>
<td>Blinking Blue: The firmware is being updated. Do not remove the modem from the PC.</td>
<td>3G models</td>
</tr>
<tr>
<td></td>
<td>Blinking Amber: The modem is searching for service (initializing).</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solid Amber: Error—either the modem is having a problem initializing (searching for service) or is offline because of a failure. Contact your service provider.</td>
<td>3G models</td>
</tr>
<tr>
<td>2G Off</td>
<td>Off: The modem is unable to detect 2G service.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blinking Amber: The modem has detected a 2G network (EDGE, GPRS, GSM) and is ready to connect.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solid Amber: The modem is connected to a 2G network and is able to send and receive data.</td>
<td>3G models</td>
</tr>
<tr>
<td>3G Off</td>
<td>Off: The modem is unable to detect 3G service.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blinking Blue: The modem has detected a 3G network (UMTS, HSDPA) and is ready to connect.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Solid Blue: The modem is connected to a 3G network and can send and receive data.</td>
<td>3G models</td>
</tr>
</tbody>
</table>

1. 3G = Third-Generation.
2. WWAN = wireless WAN.
3. RSSI = Received Signal Strength Indicator.
4. GSM = Global System for Mobile Communication.
5. CDMA = code division multiple access.

**Table 4**

<table>
<thead>
<tr>
<th>LED</th>
<th>Color</th>
<th>Description</th>
<th>3G models</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G GSM⁴</td>
<td>Green</td>
<td>On—Service is established.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off—No service.</td>
<td>3G models</td>
</tr>
<tr>
<td>3G CDMA⁵</td>
<td>Green</td>
<td>On—Service is established.</td>
<td>3G models</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off—No service.</td>
<td>3G models</td>
</tr>
</tbody>
</table>
Feature History

<table>
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<tr>
<td>12.4(15)T</td>
<td>This feature was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td>12.4(15)T1</td>
<td>This feature was updated.</td>
</tr>
<tr>
<td>15.0(1)M</td>
<td>The HSPA feature was introduced.</td>
</tr>
<tr>
<td>15.1(1)T</td>
<td>The CDMA feature was integrated into the Cisco 880 Series Integrated Service Routers with Cisco IOS Release 15.1(1)T.</td>
</tr>
</tbody>
</table>

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click Cancel at the login dialog box and follow the instructions that appear.

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- Restrictions for Configuring 3G Wireless, page 8
- Technology Overview, page 9
- Overview of SNMP MIBs, page 10
- Configuring the 3G Wireless Modular and Fixed Cisco ISRs, page 17
- Configuring Data DedicatedTransmission Mode (DDTM), page 29
- Modem Firmware Upgrade, page 34
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- Troubleshooting Tips, page 102

Prerequisites for Configuring 3G Wireless

The following are prerequisites to configuring the 3G wireless HWICs:

- You must have service availability from a wireless service provider, and you must have network coverage where your router will be physically located. For a complete list of supported carriers, see the data sheet at the following URL: http://www.cisco.com/go/3g

- You must subscribe to a service plan with a wireless service provider. For manual activation, you will need the following specific information from the provider:
  - Master Subsidy Lock (MSL) number
  - Mobile Directory number (MDN)
  - MSID

The ESN number is on the modem itself, as shown in Figure 3. Make sure that your service is registered with the ESN number. You can also obtain the ESN by using the show cellular hardware command.
You must install the required antennas before you configure the 3G wireless HWIC. See the following URLs for instructions on how to install the antennas:

- 3G-ANTM1919D—See the *Cisco Multiband Swivel Mount Dipole Antenna (3G-ANTM1919D)*
- 3G-ANTM1916-CM—See the *Cisco Multiband Omnidirectional Ceiling Mount Antenna (3G-ANTM1916-CM)*
- 3G-AE015-R (Antenna Extension)—See the *Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (3G-AE015-R)*
- 3G-ANTMOUT-OM—See the *Cisco 3G Omnidirectional Outdoor Antenna (3G-ANTM-OUT-OM)*
- 3G-ANTM-OUT-LP—See the *Cisco 3G Low Profile Outdoor Antenna (3G-ANTM-OUT-LP)*
- 3G-ACC-OUT-LA—See the *Cisco 3G Lightning Arrestor (3G-ACC-OUT-LA)*

You must make sure to check your LEDs for signal reception as described in Table 2.

You should be familiar with Cisco IOS.

**Figure 3 Location of the ESN Number**

![Image of ESN Location](image)

1 The ESN is located on the modem that is attached to the back of the 3G wireless HWIC. The ESN is just below the barcode.

**Restrictions for Configuring 3G Wireless**

The following restrictions apply to the Cisco 3G Wireless HWICs:

- Data connection can be originated only by the 3G wireless Modular and Fixed Cisco ISRs. Remote dial-in is not supported.
- Throughput—Because of the shared nature of wireless communications, the amount of throughput that is experienced varies, depending on the number of active users or congestion in a network.
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

Technology Overview

This section contains the following topics:

- CDMA Network Overview, page 9
- Overview of SNMP MIBs, page 10
- 3G Cellular WAN MIB Architecture, page 10
- Supported Cisco Antennas and Cables, page 13

CDMA Network Overview

CDMA is a standard for mobile communication. A typical CDMA network includes terminal equipment, mobile termination, base transceiver station (BTS), base station controller (BSC), packet data serving node (PDSN), and other data network entities. The PDSN is the interface between a BSC and an internet gateway.

Figure 4 shows the relationship of the components of a typical CDMA network, including a PDSN and a branch office with the 3G wireless Modular and Fixed Cisco ISRs.

As the figure shows, the branch office connects to a radio tower and a BTS. The BTS connects to a BSC, which contains a component called the packet control function (PCF). The PCF communicates with the Cisco PDSN for data communication and with the mobile switching center (MSC) for voice.

Figure 4  Overview of the CDMA Network

- Cellular networks have higher latency, compared to wired networks. Latency rates depend on the technology and carrier. Latency can increase because of network congestion.
- Any restrictions that are a part of the terms of service from your carrier.
Overview of SNMP MIBs

Simple Management Network Protocol (SNMP) development and use is centered around the Management Information Base (MIB). An SNMP MIB is an abstract database, i.e., 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 for the 3G cellular Modular and Fixed Cisco ISRs can be classified into three categories:

- IF MIBs—describes interface statistics
- Cisco-Entity-Vendor-type-OID-MIB.my—ENTITY-MIBs are used to provide general hardware type for both the Modular and Fixed Cisco ISRs and the modem. CISCO-ENTITY-VENDORTYPE-OID-MIB assigns OIDs for Cisco components (including the HWICs & the modems). The OIDs are then used as the values of entPhysicalVendorType in the ENTITY-MIB.
- 3G cellular 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 Rev0

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
- Notifications

You can use MIB object c3gStandard defined in the c3gWanCommonTable to distinguish between CDMA or GSM and implementing MIB for CDMA or GSM.
Cisco 3G MIB supports both SNMP V3 and V2.

At a high level, the Cisco 3G WAN MIBs are divided into two groups and have the following structure:
1. ciscoWan3gMIBObjects—this group defines all the MIB objects for Cisco 3G WAN MIBs
2. ciscoWan3gMIBNotifs—this group defines all the notification events 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 CDMA 2000 standards (3GPP2)
- c3gWanGsm—defines the MIB objects specific for GSM/UMTS standards (3GPP)

**c3gWanCdma**

Under c3gWanCdma, there are seven sub-groups:
- c3gCdmaSessionTable for session related objects
- c3gCdmaConnectionTable for connection related objects
- c3gCdmaIdentityTable for user identity related objects
- c3gCdmaNetworkTable for network related objects
- c3gCdmaProfile for user profile related objects
- c3gCdmaRadio for radio related objects
- c3gCdmaSecurityTable for security related objects

**c3gWanGsm**

Under c3gWANGsm, there are five sub-groups:
- c3gGsmIdentityTable for user identity related objects.
- c3gGsmNetworkTable for network related objects.
- c3gGsmPdpProfile for PDP profile related objects.
- c3gGsmRadio for radio related objects.
- c3gGsmSecurityTable for security related objects.

**ciscoWan3gMIBNotifs**

Cisco Cellular 3G WAN MIB implementation supports SNMP GET (read operation) for all MIB objects, and SNMP SET (write operation) for the following RW (read-write) objects and more:
- c3gRssiOnsetNotifThreshold
- c3gRssiAbateNotifThreshold
- c3gEcIoOnsetNotifThreshold
- c3gEcIoAbateNotifThreshold
- c3gModemTemperOnsetNotifThreshold
- c3gModemTemperAbateNotifThreshold
- c3gModemReset
• c3gModemUpNotifEnabled
• c3gModemDownNotifEnabled
• c3gServiceChangedNotifEnabled
• c3gNetworkChangedNotifEnabled
• c3gConnectionStatusChangedNotifFlag
• c3gRssiOnsetNotifFlag
• c3gRssiAbateNotifFlag
• c3gEcIoOnsetNotifFlag
• c3gEcIoAbateNotifFlag
• c3gModemTemperOnsetNotifEnabled
• c3gModemTemperAbateNotifEnabled

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

Note The IF MIBs also have traps 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 5 shows various notifications and what they mean.

<table>
<thead>
<tr>
<th>Traps</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ModemUpNotification</td>
<td>Modem successfully recognized.</td>
</tr>
<tr>
<td>ModemDown</td>
<td>Crash or power-cycle.</td>
</tr>
<tr>
<td>Change Notification</td>
<td>Notifies about changes in service objects related to this notification—previous service type to current service type.</td>
</tr>
<tr>
<td>ConnectionStatus</td>
<td>Shows the connection status. Service type is included in this notification.</td>
</tr>
</tbody>
</table>

Restrictions

• For the router that runs the SNMP agent, you must configure appropriate access control (e.g. 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 GET and SET operation.
Supported Cisco Antennas and Cables

Table 6 lists the Cisco antennas that are supported for use on the 3G Modular and Fixed Cisco ISRs.

**Table 6  **Cisco Antennas Supported on Modular 3G ISRs

<table>
<thead>
<tr>
<th>Cisco Part Number</th>
<th>Antenna Type</th>
<th>Maximum Gain and Frequency Range</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G-ANTM1919D</td>
<td>Dipole omnidirectional</td>
<td>0 dBi (806–960 MHz) 0 dBi (1710–2170 MHz)</td>
<td>This is the default antenna. Multiband faceplate-mounted dipole antenna. For more information, see the <em>Cisco Multiband Swivel Mount Dipole Antenna (3G-ANTM1919D)</em> document.</td>
</tr>
<tr>
<td>3G-ANTM1916-CM</td>
<td>High-gain ceiling-mount omnidirectional</td>
<td>1.5 dBi (806–960 MHz) 2.5 dBi (1710–2170 MHz)</td>
<td>Multiband ceiling-mounted omnidirectional antenna. For more information, see the <em>Cisco Multiband Omnidirectional Ceiling Mount Antenna (3G-ANTM1916-CM)</em> document.</td>
</tr>
<tr>
<td>3G-AE015-R (Antenna Extension)</td>
<td>Extension base</td>
<td>0.8–6.0 GHz</td>
<td>This antenna extension is a base with a 15-foot cable included for use with a dipole omnidirectional antenna. For more information, see the <em>Cisco Single-Port Antenna Stand for Multiband TNC Male-Terminated Portable Antenna (3G-AE015-R)</em> document.</td>
</tr>
<tr>
<td>3G-ANTM-OUT-OM</td>
<td>Outdoor Omnidirectional</td>
<td>+2 dBi 800/900 MHz +4 dBi 1800/1900/2100 MHz</td>
<td>This is an outdoor low profile omnidirectional mast antenna. For more information, see <em>Cisco 3G Omnidirectional Outdoor Antenna (3G-ANTM-OUT-OM)</em></td>
</tr>
<tr>
<td>3G-ANTM-OUT-LP</td>
<td>Low Profile Stick Antenna</td>
<td>- 1.5 dBi 850, 900 MHz - 2.5 dBi 1800, 1900, 2100 MHz</td>
<td>This is an omnidirectional stick antenna. For more information, see <em>Cisco 3G Low Profile Outdoor Antenna (3G-ANTM-OUT-LP)</em></td>
</tr>
<tr>
<td>3G-ACC-OUT-LA (Lightning Arrestor)</td>
<td>Lightning Arrestor</td>
<td>800 MHz to 2200 MHz</td>
<td>This is a quarter-wave lightning protector with integrated high-pass filter. For more information, see <em>Cisco 3G Lightning Arrestor (3G-ACC-OUT-LA)</em></td>
</tr>
</tbody>
</table>

Table 7 lists insertion loss information for the ultra-low-loss (ULL) LMR 400 extension cables available from Cisco for use with 3G Modular and Fixed Cisco ISR antennas.

**Table 7**  Cisco Extension Cables for Use with Antennas

<table>
<thead>
<tr>
<th>Cisco Product Number</th>
<th>Cable Length</th>
<th>Insertion Loss</th>
<th>Frequency (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G-CAB-ULL-20</td>
<td>20 ft (6 m)</td>
<td>1.50 dB max.</td>
<td>2100</td>
</tr>
<tr>
<td>3G-CAB-ULL-50</td>
<td>50 ft (15 m)</td>
<td>3.50 dB max.</td>
<td>2100</td>
</tr>
<tr>
<td>3G-CAB-LMR240-25</td>
<td>25 ft (7.5 m)</td>
<td>3.50 dB max.</td>
<td>2200</td>
</tr>
<tr>
<td>3G-CAB-LMR240-50</td>
<td>50 ft (15 m)</td>
<td>6.90 dB max.</td>
<td>2200</td>
</tr>
<tr>
<td>3G-CAB-LMR240-75</td>
<td>75 ft (23 m)</td>
<td>10.5 dB max.</td>
<td>2200</td>
</tr>
</tbody>
</table>
Table 8 lists loss information for the ultra-low-loss (ULL) LMR 400 cables available from Cisco for use with 3G fixed platforms.

**Table 8**  
*Cisco Adapter Cables for using HWIC cables with 3G Fixed*

<table>
<thead>
<tr>
<th>Cisco Product Number</th>
<th>Antenna Adapter Length</th>
<th>Insertion Loss</th>
<th>Frequency (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3G-ACC-SSMB-TNC</td>
<td>14.5 inches</td>
<td>0.66 dB</td>
<td>2100</td>
</tr>
<tr>
<td>3G-ACC-TS9-TNC</td>
<td>13.5 inches</td>
<td>0.62 dB</td>
<td>2100</td>
</tr>
</tbody>
</table>

**Note** You can use the RG-174/U type cables to adapt the modem external antenna connection to any of the HWIC cables and antennas.
Figure 5 and Figure 6 show some antenna options for the 3G Modular and Fixed Cisco ISRs.

Figure 5  Antenna Options
Figure 6  Antenna Options
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 17
- Data Call Set up, page 21

Note: The procedure to configure 3G on both modular and fixed Cisco ISRs is the same except for slot numbering.

For example, for 3G HWICs, the numbering for slot 0, wic 0 and port 0 would be 0/0/0 for all commands. For a fixed Cisco ISR, it would be only 0.

Please refer to platform-specific documentation for details on slot numbering.

Modem Activation and Provisioning

To activate and provision your modem, follow these procedures:

- Verifying Signal Strength and Service Availability, page 17
- Activating the Modem, page 19

Verifying Signal Strength and Service Availability

SUMMARY STEPS

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

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

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

DETAILED STEPS

Use the following commands to verify the signal strength and service availability on your modem beginning in the EXEC mode:
<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>Router# show cellular &lt;slot/wic/port&gt; network</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td><strong>Router# show cellular 0/0/0 network</strong></td>
</tr>
<tr>
<td></td>
<td>Displays information about the carrier network, cell site, and available service.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td><strong>Router# show cellular &lt;slot/wic/port&gt; radio</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td><strong>Router# show cellular 0/0/0 radio</strong></td>
</tr>
<tr>
<td></td>
<td>Shows the radio signal strength.</td>
</tr>
<tr>
<td></td>
<td><strong>Note</strong>  The RSSI should be better than -90 dBm for steady and reliable connection and better than -80 dBm for optimal data throughput.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td><strong>Router# show cellular &lt;slot/wic/port&gt; hardware</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td><strong>Router# show cellular 0/0/0 hardware</strong></td>
</tr>
<tr>
<td></td>
<td>Shows the hardware details and modem type.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td><strong>Router# show cellular &lt;slot/wic/port&gt; all</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td><strong>Router# show cellular 0/0/0 all</strong></td>
</tr>
<tr>
<td></td>
<td>Shows consolidated information about the modem, profiles created, radio signal strength, network security, and so forth.</td>
</tr>
</tbody>
</table>
Activating the Modem

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

- **Manual Activation**, page 19
- **Activating Using OMA-DM**, page 20
- **Activating Using OTASP**, page 21

**Note**

Use the `show cellular controller` command to obtain information for the modem type for your Modular and Fixed Cisco ISRs.

Table 9 lists activation and provisioning process supported by different wireless carriers depending on the modem MC5725 and MC5727.

<table>
<thead>
<tr>
<th>Activation Procedure</th>
<th>Sprint (-S)</th>
<th>Verizon (-V)</th>
<th>Generic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Activation using MDN/MSID/MSL</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>OTASP Activation</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>OMA-DM Activation</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>IOTA for Data Profile refresh</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Manual Activation**

**Note**

You must have valid MDN, MSL, and MSID information from your carrier before you start this procedure.

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

```
cellular slot/wic_slot/port cdma activate manual mdn msid sid nid msl
```

For more information about the parameters, see the “`cellular cdma activate manual`” section on page 41.

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

Here is a sample output from this command:

```
router#cellular 0/0/0 cdma activate manual 1234567890 1234567890 1234 12 12345
NAM 0 will be configured and will become Active
Modem will be activated with following Parameters
  MDN :1234567890; MSID :1234567890; SID :1234; NID 12:
  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
Account activation - Step 4 of 5
Account activation - Step 5 of 5
Secure Commit Result: Succeed
Done Configuring - Resetting the modem
The activation of the account is Complete
Waiting for modem to be ready to start IOTA
Beginning IOTA
router#*
Feb 6 23:29:08.459: IOTA Status Message Received. Event: IOTA Start, Result: SUCCESS
Feb 6 23:29:08.459: Please wait till IOTA END message is received
Feb 6 23:29:08.459: It can take up to 5 minutes
Feb 6 23:29:27.951: OTA State = SPL unlock, Result = Success
Feb 6 23:29:32.319: OTA State = Parameters committed to NVRAM, Result = Success
Feb 6 23:29:40.999: Over the air provisioning complete; Result:Success
Feb 6 23:29:41.679: IOTA Status Message Received. Event: IOTA End, Result: SUCCESS

Note
The IOTA start and end must have “success” as the resulting output. If you receive an error message, you can run IOTA independently by 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 profile 1 (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 <x> seconds".
- If activation is still unsuccessful, the 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 beginning 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.
Activating Using OTASP

To provision and activate your modem using OTASP, use the following command beginning 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
```

```
*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 22
- Configuring DDR, page 23
- Configuring DDR Backup, page 26
- Configuring Multiple Mobile IP Profiles, page 29
- Configuring Data DedicatedTransmission Mode (DDTM), page 29
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

Figure 7 shows a data call setup using the 3G wireless HWIC.

Figure 7 Data Call Setup with the HWIC-3G-CDMA

Configuring the Cellular Interface

To configure the cellular interface, enter the following commands in the cellular interface mode.

SUMMARY STEPS

1. `configure terminal`
2. `interface cellular <slot/wic/port>`
3. `encapsulation ppp`
4. `ppp chap password 0 <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, i.e., 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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>Enters global configuration mode from the terminal.</strong></td>
</tr>
<tr>
<td>Router# configure terminal</td>
<td></td>
</tr>
</tbody>
</table>

**Example:**

Router# configure terminal

**Step 2** | **Specifies the cellular interface.** |
| Router(config)# interface cellular <slot/wic/port> | |

**Example:**

Router (config)# interface cellular 0/0/0

**Step 3** | **Specifies PPP encapsulation for an interface configured for dedicated asynchronous mode or dial-on-demand routing (DDR).** |
| Router(config-if)# encapsulation ppp | |

**Example:**

Router (config-if)# encapsulation ppp

**Step 4** | **Defines an interface-specific CHAP password.** |
| Router (config-if)# ppp chap password <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. |

**Example:**

Router (config-if)# ppp chap password cisco

**Step 5** | **Returns a line that has been placed into dedicated asynchronous network mode to interactive mode, thereby enabling the slip and ppp EXEC commands.** |
| Router(config-if)# async mode interactive | |

**Example:**

Router (config-if)# async mode interactive

**Step 6** | **Specifies that the IP address for a particular interface is obtained via PPP/IPCP address negotiation.** |
| Router(config-if)# ip address negotiated | |

**Example:**

Router (config-if)# ip address negotiated

When static IP address is required for the cellular interface, the address may be configured as **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 “Basic Cellular Interface Configuration: Example” section on page 30.

### Configuring DDR

To configure DDR for the cellular interface, follow these steps:
**SUMMARY STEPS**

1. `configure terminal`
2. `interface cellular <slot/wic/port>`
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 <slot/wic/port>`
11. `script dialer <regexp>`
12. `exit`
13. `chat-script <script name> "" "ATDT#777" TIMEOUT <timeout value> CONNECT`
14. `interface cellular <slot/wic/port>`
15. `dialer string <string>`

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
</tr>
<tr>
<td>Router# <code>configure terminal</code></td>
<td>Enters global configuration mode from the terminal.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router# <code>configure terminal</code></td>
<td></td>
</tr>
</tbody>
</table>

| **Step 2** | 
| Router(config)# `interface cellular <slot/wic/port>` | Specifies the cellular interface. |
| **Example:** | 
| Router (config)# `interface cellular 0/0/0` | |

| **Step 3** | 
| Router(config-if)# `dialer in-band` | Enables DDR and configures the specified serial interface to use in-band dialing. |
| **Example:** | 
| Router (config-if)# `dialer in-band` | |

| **Step 4** | 
| Router(config-if)# `dialer idle-timeout <seconds>` | Specifies the duration of idle time, in seconds, after which a line will be disconnected. |
| **Example:** | 
| Router (config-if)# `dialer idle-timeout 30` | |

<p>| <strong>Step 5</strong> |
| Router(config-if)# <code>dialer string &lt;string&gt;</code> | Specifies the number or string to dial. Use the name of the CHAT script here. |
| <strong>Example:</strong> |
| Router (config-if)# <code>dialer string cdma</code> | |</p>
<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Router (config-if)# dialer-group &lt;number&gt;</td>
<td>Specifies the number of the dialer access group to which the specific interface belongs.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config-if)# dialer-group 1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Router (config-if)# exit</td>
<td>Enters the global configuration mode.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config-if)# exit</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Router (config)# dialer-list &lt;dialer-group&gt; protocol &lt;protocol-name&gt; (permit</td>
<td>deny</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config)# dialer-list 1 protocol ip list 1</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Router (config)# ip access-list &lt;access list number&gt; permit &lt;ip source address&gt;</td>
<td>Defines traffic of interest.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config)# ip access list 1 permit any</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Router (config)# line &lt;slot/wic/port&gt;</td>
<td>Specifies the line configuration mode.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config-line)# line 0/0/0</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Router (config-line) script dialer &lt;regexp&gt;</td>
<td>Specifies a default modem chat script.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config-line)# script-dialer cdma</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Router (config-line) exit</td>
<td>Exits line configuration mode.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config-line)# exit</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Router (config)# chat-script &lt;script name&gt; &quot;&quot; &quot;&quot; ATDT#777&quot; TIMEOUT &lt;timeout value&gt; CONNECT</td>
<td>Defines the ATDT commands when the dialer is initiated.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config)# chat-script cdma &quot;&quot; &quot;&quot;ATDT#777&quot; TIME OUT 60 &quot;CONNECT&quot;</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Router (config)# interface cellular &lt;slot/wic/port&gt;</td>
<td>Specifies the cellular interface.</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config)# interface cellular 0/1/0</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Router (config-if)# dialer string &lt;string&gt;</td>
<td>Specifies the dialer script (defined using the chat script command).</td>
</tr>
<tr>
<td></td>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Router (config)# dialer string cdma</td>
<td></td>
</tr>
</tbody>
</table>
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

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.
- **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.
- **Dialer Watch**—Dialer watch is a backup feature that integrates dial backup with routing capabilities.

Configuring Interfaces to Use a Backup Interface

To configure one or more interfaces to use a backup interface, use the following commands, beginning in global configuration mode.

**SUMMARY STEPS**

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

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config)# interface type number</td>
<td>Specifies the interface to be backed up and begins interface configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config)# interface ATM0/0/0</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config-if)# backup interface cellular &lt;number&gt;</td>
<td>Specifies the cellular interface as backup.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config-if)# backup interface cellular0/3/0</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config-if)# backup delay enable-delay</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config-if)# backup delay enable delay</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

- You cannot configure a backup interface for the cellular interface and any other asynchronous serial interface.
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, use the following commands in interface configuration mode.

**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 <slot/wic/port>`
8. `dialer-group <dialer group number>`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Router# <code>configure terminal</code></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router# <code>configure terminal</code></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Router(config)# <code>interface type number</code></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router (config)# <code>interface ATM0/0/0</code></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Router(config-if)# <code>dialer watch-group group-number</code></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-if)# <code>dialer watch-group 2</code></td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>Router(config)# <code>dialer watch-list group-number ip ip-address address-mask</code></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config-if)# <code>dialer watch-list 2 ip 10.4.0.254 255.255.0.0</code></td>
</tr>
<tr>
<td><strong>Step 5</strong></td>
<td>Router(config)# `dialer-list &lt;dialer-group&gt; protocol &lt;protocol-name&gt; {permit</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Router(config)# <code>dialer-list 2 protocol ip permit</code></td>
</tr>
</tbody>
</table>
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

Configuring DDR Backup Using Floating Static Route

To configure a floating static default route on the secondary interface beginning in the global configuration mode, perform the following tasks.

**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

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 <code>configure terminal</code></td>
<td>Enters global configuration mode from the terminal.</td>
</tr>
<tr>
<td>Example: <code>configure terminal</code></td>
<td></td>
</tr>
<tr>
<td>Step 2 `ip route network-number network-mask [ip-address</td>
<td>interface] [administrative distance] [name name]`</td>
</tr>
<tr>
<td>Example: <code>ip route 0.0.0.0 Dialer 2 track 234</code></td>
<td>A higher administrative distance should be configured for the route through the backup interface, so that it is used only when the primary interface is down.</td>
</tr>
</tbody>
</table>
Configuring Multiple Mobile IP Profiles

This procedure is for the HWIC-3G-CDMA-S and HWIC-3G-CDMA SKUs only.

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

SUMMARY STEPS

1. cellular cdma profile configure
2. cellular cdma profile select

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1**  
  `Router# cellular <slot/wic/port> cdma profile configure <profile number> <primary home agent address> <secondary home agent address> <mobile home agent address> <NAI> <MN-AAA SPI> <MN-HA SPI> <Reverse Tunneling Preference>` | Configures data (MIP) profile.  
  **Note** Parameters for this command may be different for different SKUs. Please refer to the cellular cdma profile configure command for details. |
| **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` |                                                                 |

| **Step 2**  
  `Router# cellular <slot/wic/port> cdma profile select <profile number>` | Sets a profile as the current active profile. |
| **Example:**  
  `Router# cellular 0/0/0 cdma profile select 1` | |

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 dedicated data transmission mode (DDTM) on a CDMA modem, use the `cdma ddtm` command in configuration mode.

This command is enabled by default. You can disable this feature by using the `no cdma ddtm` command.

Note
When DDTM is enabled, only voice calls will be blocked for the MC5728v modems, while on the AC597E and MC5725 and MC 5727, incoming SMS messages will also be blocked.

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

This section provides the following configuration examples:
- **Basic Cellular Interface Configuration: Example**
- **Tunnel over Cellular Interface Configuration: Example**
- **3G Wireless Modem as Backup with NAT and IPSec: Example**

### Basic Cellular Interface Configuration: Example

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

```bash
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
```

### Tunnel over Cellular Interface Configuration: Example

The following sample configuration shows the configuration of the static IP address when a tunnel interface is configured using the `ip address unnumbered <cellular interface>` command:

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

The following sample configuration shows the configuration of the 3G wireless modem on the router as backup with NAT and IPSec:

```plaintext
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

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

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
Modem Firmware Upgrade

The 3G wireless Modular and Fixed Cisco ISR modem firmware can be upgraded by 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 whether the new firmware version has been certified by your wireless service provider. Using an uncertified firmware version on the modem may affect the wireless service provider network adversely.

**Note**

Perform modem upgrade only if necessary. Downgrade is generally not supported, and may or may not work.

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


**SUMMARY STEPS**

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.
2. Download the appropriate CDMA firmware release under Wireless Integrated Switches and Routers.
3. Use the archive command to extract the firmware distribution into the router flash memory:
   `archive tar /xtract source-url destination-url`
4. Use the following command to initiate the firmware upgrade process:
   `microcode reload cellular pa-bay slot cdma modem-provision`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> Go to the Download Software site at: <a href="http://software.cisco.com/download/navigator.html">http://software.cisco.com/download/navigator.html</a> and select Wireless &gt; Wireless Integrated Switches and Routers. In the third column, select Verizon or Sprint, depending on the type of card you have.</td>
<td>Provides access to Cisco Wireless WAN software downloads. Select firmware for Cisco 3G wireless Modular and Fixed Cisco ISRs. <strong>Note</strong> This website is only available to registered Cisco.com users.</td>
</tr>
<tr>
<td><strong>Step 2</strong> Download the appropriate CDMA firmware release under Wireless Integrated Switches and Routers.</td>
<td>Downloads the modem firmware package to a TFTP/FTP server that is accessible from the router in which the 3G wireless Modular and Fixed Cisco ISRs is installed.</td>
</tr>
</tbody>
</table>
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

Command Reference

This section documents new commands only.

- cdma ddtm
- 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
- debug cell-hwic driver

---

**Caution**

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

---

### Command Reference

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 3**
  router# archive tar /xtract source-url destination-url |
  **Example:**
  Router# archive tar /xtract tftp://192.168.1.1/MC5725_00_57_00_vzw_package.tar flash |
  Uncompresses the files of the modem firmware package and copies them to a location that is accessible by the router in which the 3G wireless Modular and Fixed Cisco ISR is installed.
  *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 4
  router# microcode reload cellular pa-bay slot cdma modem-provision |
  Initiates the firmware upgrade process.
  *pa-bay*—Use 0 for HWIC.
  *slot*—Slot number where the HWIC is plugged in.
  **Note**
  This command automatically shuts down the cellular interface. The firmware upgrade process may take up to 15 minutes, during which the modem is inaccessible. After the command is complete, the interface is brought up again.

---

Do not disconnect power or switch the router off during the firmware upgrade process. Either action may result in permanent modem failure.
- debug cell-hwic firmware
- debug cell-hwic virt-con
- debug cellular messages all
- debug cellular messages async
- debug cellular messages data
- debug cellular messages dm
- debug cellular messages management
- debug cellular messages oma-dm
- show cellular all
- show cellular connection
- show cellular connection
- show cellular hardware
- show cellular network
- show cellular oma-dm
- show cellular profile
- show cellular radio
- show cellular security
- 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 configuration mode.

```
    cdma ddtm
```

To disable DDTM, use the no form of this command.

**Command Default**

DDTM is enabled by default.

**Command Modes**

Configuration.

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.1(4)M1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

The following example shows the configuration to enable 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)
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. IOTA is used to activate the modem data profile by certain wireless service providers. Use this command to display the current active connection state and statistics. (Ask your carrier whether IOTA is supported and how often a refresh is needed.)

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

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

### Command Default

None.

### Command Modes

EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

You can verify the updated modem data profile by 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 example shows 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: 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 23:32:49.235: OTA State = Parameters commited to NVRAM, Result = Success
*Feb 6 23:32:52.007: Over the air provisioning complete; Result:Success
*Feb 6 23:32:52.615: IOTA Status Message Received. Event: IOTA End, Result: SUCCESS
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cellular cdma activate manual</code></td>
<td>Manually activates a cellular account using the over the air service (OTA) procedure.</td>
</tr>
<tr>
<td><code>show cellular profile</code></td>
<td>Displays the cellular profile information.</td>
</tr>
</tbody>
</table>
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

**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 MDN, MSID, and MSN—or activation using over-the-air service provisioning (OTASP) is supported.

```
  cellular slot/wic_slot/port cdma activate manual mdn msid sid nid msl
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
<tr>
<td>mdn</td>
<td>Ten digit mobile directory number (MDN).</td>
</tr>
<tr>
<td>msid</td>
<td>Ten digit mobile subscriber identification number (MSID).</td>
</tr>
<tr>
<td>sid</td>
<td>System ID (SID) number between 0 and 32767.</td>
</tr>
<tr>
<td>nid</td>
<td>Network ID (NID) number between 0 and 65535.</td>
</tr>
<tr>
<td>msl</td>
<td>Mobile subscriber lock, to be obtained from your service provider.</td>
</tr>
</tbody>
</table>

**Command Default**
None.

**Command Modes**
EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use the `show cellular network` command to obtain the SID and NID.

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 sample output from the `cellular cdma activate manual` command:

```
router# cellular 0/0/0 cdma activate manual 9135938079 9135938079 4183 87 907148
```
NAM 0 will be configured and will become Active
Modem will be activated with following Parameters
MDN :9135938079; MSID :9135938079; 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
Account activation - Step 4 of 5
Account activation - Step 5 of 5
Secure Commit Result: Succeed
Done Configuring - Resetting the modem
The activation of the account is Complete
Waiting for modem to be ready to start IOTA
Beginning IOTA
router#
*Feb 6 23:29:08.459: IOTA Status Message Received. Event: IOTA Start, Result: SUCCESS
*Feb 6 23:29:08.459: Please wait till IOTA END message is received
*Feb 6 23:29:08.459: It can take up to 5 minutes
*Feb 6 23:29:27.951: OTA State = SPL unlock, Result = Success
*Feb 6 23:29:32.319: OTA State = Parameters commited to NVRAM, Result = Success
*Feb 6 23:29:40.999: Over the air provisioning complete; Result:Success
*Feb 6 23:29:41.679: IOTA Status Message Received. Event: IOTA End, Result: SUCCESS

The following is 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
```
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cellular cdma activate iota</strong></td>
<td>Manually activates a cellular account using the Internet over-the-air service procedure.</td>
</tr>
<tr>
<td><strong>show cellular profile</strong></td>
<td>Displays the cellular profile information.</td>
</tr>
</tbody>
</table>
cellular cdma activate oma-dm device config

To start a user-initiated 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
```

This refreshes the MDN and MSID numbers on the account.

**Syntax Description**

<table>
<thead>
<tr>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
</table>

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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**

This section contains sample output for `cellular slot/wic_slot/port cdma activate oma-dm device-config` command:

**Sample Output for HWIC-3G-CDMA**

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

```
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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cellular oma-dm</code></td>
<td>Displays an OMA-DM session details.</td>
</tr>
<tr>
<td><code>cellular cdma activate oma-dm ni-alert</code></td>
<td>Allows or denies a network initiated alert (NIA) queued in the modem.</td>
</tr>
<tr>
<td><code>cellular cdma activate oma-dm prl-update</code></td>
<td>Starts a user initiated OMA-DM session to get an over-the-air PRL update.</td>
</tr>
<tr>
<td><code>debug cellular messages oma-dm</code></td>
<td>Starts OMA-DM debugging.</td>
</tr>
<tr>
<td><code>show cellular profile</code></td>
<td>Displays cellular profile information.</td>
</tr>
</tbody>
</table>
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 [allow | deny] command in privileged EXEC mode.

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

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
<tbody>
<tr>
<td>allow</td>
<td>allow</td>
<td>Allow a network initiated alert.</td>
</tr>
<tr>
<td>deny</td>
<td>deny</td>
<td>Deny a network initiated alert.</td>
</tr>
</tbody>
</table>

**Command Default**
None

**Command Modes**
Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

On execution of this command, a warning message appears 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**

This section contains sample output for cellular slot/wic_slot/port cdma activate oma-dm ni-alert command:

**Sample Output for HWIC-3G-CDMA**
The following example shows output for HWIC-3G-CDMA for slot 0, WIC slot 0, port 0 with Network Initiated Alert while the modem is in dormant state (cellular slot/wic_slot/port cdma activate oma-dm ni-alert allow):

```
*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]
```
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA and HWIC-3G-CDMA-x)

[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 example shows output for HWIC-3G-CDMA for slot 0, WIC slot 0, port 0 for the cellular slot/wic_slot/port cdma activate oma-dm ni-alert deny command:

*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 19 describes the output fields from the command.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interactive response accepted</td>
<td>The alert response is accepted by the modem. You will see OMA-DM status messages in SYSLOG or console.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fail: Interactive response not expected</td>
<td>No alert queued in the modem.</td>
</tr>
<tr>
<td>Fail: Invalid response</td>
<td>Not a valid response.</td>
</tr>
</tbody>
</table>

Related Commands

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

To start a user initiated 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

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

PRL updates are available 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

This section contains sample output for cellular slot/wic_slot/port cdma activate oma-dm prl-update command:

#### Sample Output for HWIC-3G-CDMA

The following example shows output for HWIC-3G-CDMA for slot 0, WIC slot 0, port 0 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 example shows output for HWIC-3G-CDMA for slot 0, WIC slot 0, port 0 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)

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cellular oma-dm</code></td>
<td>Displays an OMA-DM session details.</td>
</tr>
<tr>
<td><code>cellular cdma activate oma-dm</code></td>
<td>Allows or denies a network initiated alert (NIA) queued in the modem.</td>
</tr>
<tr>
<td><code>cellular cdma activate oma-dm</code></td>
<td>Starts a user initiated OMA-DM session to provision an account and profile update.</td>
</tr>
<tr>
<td><code>device config</code></td>
<td></td>
</tr>
<tr>
<td><code>debug cellular messages oma-dm</code></td>
<td>Starts OMA-DM debugging.</td>
</tr>
<tr>
<td><code>show cellular profile</code></td>
<td>Displays cellular profile information.</td>
</tr>
</tbody>
</table>
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 MDN, MSID, and MSN—or activation using OTASP.

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

### Syntax Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
<tr>
<td>phone_number</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Command Default
None.

### Command Modes
Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

### 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 example shows output of the cellular cdma activate otasp command:

```
router# cellular 0/1/0 cdma activate otasp *22899
Beginning OTASP activation
OTASP number is *22899
```

```
*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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cellular profile</code></td>
<td>Displays the cellular profile information.</td>
</tr>
</tbody>
</table>
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**

<table>
<thead>
<tr>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
<tbody>
<tr>
<td>hybrid</td>
<td>Connect to EVDO/1xRTT services (Default Mode)</td>
</tr>
<tr>
<td>EVDO-only</td>
<td>Connect only to EVDO service</td>
</tr>
<tr>
<td>1xRTT-only</td>
<td>Connect only to 1xRTT service</td>
</tr>
</tbody>
</table>

**Command Default**

Hybrid

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

This section contains sample output for `cellular slot/wic_slot/port cdma mode` command:

**Sample Output for HWIC-3G-CDMA**

The following example shows output for HWIC-3G-CDMA for slot 0, WIC slot 1, port 1:

Router#cellular 0/0/0 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 19** describes the output fields from the command.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1xRTT</td>
<td>Modem will connect to 1xRTT only service</td>
</tr>
<tr>
<td>EVDO</td>
<td>Modem will connect to EVDO only service</td>
</tr>
<tr>
<td>Hybrid</td>
<td>Modem will connect to EVDO and 1xRTT service (default)</td>
</tr>
</tbody>
</table>
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cellular cdma activate manual</td>
<td>Manually activates a cellular account using the over-the-air service (OTA) procedure.</td>
</tr>
<tr>
<td>cellular cdma activate otasp</td>
<td>Activates a cellular account using the over-the-air provisioning (OTASP).</td>
</tr>
<tr>
<td>cellular cdma activate iota</td>
<td>Provisions data profile using Internet-based over-the-air provisioning (IOTA).</td>
</tr>
</tbody>
</table>

**Note**

IOTA is supported only with certain wireless service providers. Please check with your wireless service provider.
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**

<table>
<thead>
<tr>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
<tbody>
<tr>
<td>profile number</td>
<td>Profile number to be configured</td>
</tr>
<tr>
<td>primary HA address</td>
<td>Primary Home Agent Address as obtained from Service Provider</td>
</tr>
<tr>
<td>secondary HA address</td>
<td>Secondary Home Agent Address as obtained from Service Provider</td>
</tr>
<tr>
<td>mobile HA*</td>
<td>Mobile Home Agent. This parameter is only needed for generic SKUs.</td>
</tr>
<tr>
<td>NAI</td>
<td>Network Access Identifier</td>
</tr>
<tr>
<td>MN-AAA SS</td>
<td>Mobile Node AAA Shared Secret</td>
</tr>
<tr>
<td>MN-HA SS</td>
<td>Mobile Node Home Agent shared secret</td>
</tr>
<tr>
<td>MN-AAA SPI*</td>
<td>Mobile Node AAA Security Parameter Index</td>
</tr>
<tr>
<td>MN-HA SPI*</td>
<td>Mobile Node Home Agent Security Parameter Index</td>
</tr>
<tr>
<td>rev-tunneling*</td>
<td>Reverse tunneling preference</td>
</tr>
</tbody>
</table>

* denotes parameters not available in HWIC-3G-CDMA-S

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

This section contains sample output for cellular slot/wic_slot/port cdma profile configure command:

```
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
```
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

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#
### Related Commands

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

<table>
<thead>
<tr>
<th>Syntax</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
<tr>
<td>profile number</td>
<td>Profile number to be configured</td>
</tr>
<tr>
<td>primary HA address</td>
<td>Primary Home Agent Address as obtained from Service Provider</td>
</tr>
<tr>
<td>secondary HA address</td>
<td>Secondary Home Agent Address as obtained from Service Provider</td>
</tr>
<tr>
<td>mobile HA*</td>
<td>Mobile Home Agent. This parameter is only needed for generic SKUs.</td>
</tr>
<tr>
<td>NAI</td>
<td>Network Access Identifier</td>
</tr>
<tr>
<td>MN-AAA SS</td>
<td>Mobile Node AAA Shared Secret</td>
</tr>
<tr>
<td>MN-HA SS</td>
<td>Mobile Node Home Agent shared secret</td>
</tr>
<tr>
<td>MN-AAA SPI*</td>
<td>Mobile Node AAA Security Parameter Index</td>
</tr>
<tr>
<td>MN-HA SPI*</td>
<td>Mobile Node Home Agent Security Parameter Index</td>
</tr>
<tr>
<td>rev-tunneling*</td>
<td>Reverse tunneling preference</td>
</tr>
</tbody>
</table>

*denotes parameters not available in HWIC-3G-CDMA-S

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

This section contains sample output for **cellular slot/wic_slot/port cdma profile select** command:

**Sample Output for HWIC-3G-CDMA**

```
router#cellular 0 cdma profile select 5 ?
<cr>
routor#cellular 0 cdma profile select 5
Profile 5 will become active
```
### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cellular cdma activate iota</strong></td>
<td>Provisions data profile using Internet-based over-the-air provisioning (IOTA).</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>IOTA is supported only with certain wireless service providers. Please check with your wireless service provider.</td>
</tr>
<tr>
<td><strong>cellular cdma activate manual</strong></td>
<td>Manually activates a cellular account using the over-the-air service (OTA) procedure.</td>
</tr>
<tr>
<td><strong>cellular cdma activate oma-dm device config</strong></td>
<td>Starts a user-initiated OMA-DM session for modem activation.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>IOTA is supported only with certain wireless service providers. Please check with your wireless service provider.</td>
</tr>
<tr>
<td><strong>cellular cdma activate otasp</strong></td>
<td>Activates a cellular account using the over the air service provisioning (OTASP).</td>
</tr>
</tbody>
</table>
debug cell-hwic driver

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

```
debbug cell-hwic slot/wic_slot/port driver {crcdump | errdump | errors}
```

**Syntax Description**

<table>
<thead>
<tr>
<th><strong>slot/wic_slot/port</strong></th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>crcdump</strong></td>
<td>CRC error details.</td>
</tr>
<tr>
<td><strong>errdump</strong></td>
<td>Other error details.</td>
</tr>
<tr>
<td><strong>errors</strong></td>
<td>Errors debugging.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

EXEC (#)

**Command History**

<table>
<thead>
<tr>
<th><strong>Release</strong></th>
<th><strong>Modification</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td>12.2SX</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command for debugging purposes only.

**Related Commands**

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

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

```
debug cellular slot/wic_slot/port firmware
```

**Syntax Description**

<table>
<thead>
<tr>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
</table>

**Command Default**

None

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td>12.4(22)YB1</td>
<td>This command was integrated into Cisco IOS Release 12.4(22)YB1.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command for debugging purposes only.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>debug cellular messages async</td>
<td>Debugs cellular async.</td>
</tr>
<tr>
<td>debug cellular messages data</td>
<td>Prints Cisco IOS data path debug messages.</td>
</tr>
<tr>
<td>debug cell-hwic driver</td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td>debug cellular messages dm</td>
<td>Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.</td>
</tr>
<tr>
<td>debug cell-hwic virt-con</td>
<td>Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.</td>
</tr>
</tbody>
</table>
debug cell-hwic virt-con

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

```
dump-data-structs | log | monitor | wrapper-on | wrapper-off}
```

**Syntax Description**

<table>
<thead>
<tr>
<th><strong>slot/wic_slot/port</strong></th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>clear</strong></td>
<td>(Optional) Clears all virtual console debug log messages.</td>
</tr>
<tr>
<td><strong>disable</strong></td>
<td>(Optional) Disables virtual console real-time debug monitoring.</td>
</tr>
<tr>
<td><strong>dump-data-structures</strong></td>
<td>(Optional) Dumps virtual console data structures.</td>
</tr>
<tr>
<td><strong>log</strong></td>
<td>(Optional) Displays virtual console messages from the debug log.</td>
</tr>
<tr>
<td><strong>monitor</strong></td>
<td>(Optional) Enables monitoring of real-time virtual console debug messages.</td>
</tr>
<tr>
<td><strong>wrapper-on</strong></td>
<td>(Optional) Disables wraparound for virtual console log messages.</td>
</tr>
<tr>
<td><strong>wrapper-off</strong></td>
<td>(Optional) Enables wraparound for virtual console log messages.</td>
</tr>
</tbody>
</table>

**Command Default**

There is no default for this command.

**Command Modes**

EXEC (#)

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td>12.2SX</td>
<td>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.</td>
</tr>
<tr>
<td>12.4(22)YB1</td>
<td>This command was integrated into Cisco IOS Release 12.4(22)YB1.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command for debugging purposes only.

**Related Commands**

<table>
<thead>
<tr>
<th><strong>Command</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>debug cellular messages all</td>
<td>Prints all Cisco IOS driver debug messages.</td>
</tr>
<tr>
<td>debug cellular messages async</td>
<td>Debugs cellular async.</td>
</tr>
<tr>
<td>debug cellular messages data</td>
<td>Prints Cisco IOS data path debug messages.</td>
</tr>
<tr>
<td>debug cell-hwic driver</td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td>debug cell-hwic firmware</td>
<td>Displays Cisco IOS firmware information.</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>debug cellular messages</td>
<td>Prints management path messages, such as CnS.</td>
</tr>
<tr>
<td>management</td>
<td></td>
</tr>
<tr>
<td>debug cellular messages</td>
<td>Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.</td>
</tr>
<tr>
<td>dm</td>
<td></td>
</tr>
</tbody>
</table>
**debug cellular messages all**

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

```
ddebug cellular slot/wic_slot/port messages all
```

**Syntax Description**

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

**Command Default**

None

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command for debugging purposes only.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>debug cellular messages async</code></td>
<td>Debugs cellular async.</td>
</tr>
<tr>
<td><code>debug cellular messages data</code></td>
<td>Prints Cisco IOS data path debug messages.</td>
</tr>
<tr>
<td><code>debug cellular driver</code></td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td><code>debug cellular firmware</code></td>
<td>Displays Cisco IOS firmware information.</td>
</tr>
<tr>
<td><code>debug cellular messages management</code></td>
<td>Prints management path messages, such as CnS.</td>
</tr>
<tr>
<td><code>debug cellular messages dm</code></td>
<td>Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.</td>
</tr>
<tr>
<td><code>debug cellular messages virt-con</code></td>
<td>Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.</td>
</tr>
</tbody>
</table>
debug cellular messages async

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

```
d debug cellular slot/wic_slot/port messages async
```

### Syntax Description

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>slot/wic_slot/port</code></td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

Use this command for debugging purposes only.

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>debug cellular messages all</code></td>
<td>Prints all Cisco IOS driver debug messages.</td>
</tr>
<tr>
<td><code>debug cellular messages data</code></td>
<td>Prints Cisco IOS data path debug messages.</td>
</tr>
<tr>
<td><code>debug cellular driver</code></td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td><code>debug cellular firmware</code></td>
<td>Displays Cisco IOS firmware information.</td>
</tr>
<tr>
<td><code>debug cellular messages management</code></td>
<td>Prints management path messages, such as CnS.</td>
</tr>
<tr>
<td><code>debug cellular messages dm</code></td>
<td>Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.</td>
</tr>
<tr>
<td><code>debug cellular messages virt-con</code></td>
<td>Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.</td>
</tr>
</tbody>
</table>
### debug cellular messages data

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

```plaintext
show cellular slot/wic_slot/port messages data
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th><code>slot/wic_slot/port</code></th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command Default</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Command Modes</td>
<td>EXEC</td>
<td></td>
</tr>
</tbody>
</table>

#### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

#### Usage Guidelines

Use this command for debugging purposes only.

#### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>debug cellular messages all</code></td>
<td>Prints all Cisco IOS driver debug messages.</td>
</tr>
<tr>
<td><code>debug cellular messages async</code></td>
<td>Debugs cellular async.</td>
</tr>
<tr>
<td><code>debug cellular driver</code></td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td><code>debug cellular firmware</code></td>
<td>Displays Cisco IOS firmware information.</td>
</tr>
<tr>
<td><code>debug cellular messages management</code></td>
<td>Prints management path messages, such as CnS.</td>
</tr>
<tr>
<td><code>debug cellular messages dm</code></td>
<td>Prints diagnostics monitor (DM) messages from the Qualcomm CDMA chipset.</td>
</tr>
<tr>
<td><code>debug cellular messages virt-con</code></td>
<td>Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.</td>
</tr>
</tbody>
</table>
debug cellular messages dm

To print Diagnostics Monitor (DM) messages from the Qualcomm CDMA chipset, use the `debug cellular messages dm` command in EXEC mode.

```
debug cellular slot/wic_slot/port messages dm
```

**Syntax Description**

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

**Command Default**

There is no default for this command.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

Use this command for debugging purposes only.

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>debug cellular messages all</code></td>
<td>Prints all Cisco IOS driver debug messages.</td>
</tr>
<tr>
<td><code>debug cellular messages async</code></td>
<td>Debugs cellular async.</td>
</tr>
<tr>
<td><code>debug cellular messages data</code></td>
<td>Prints Cisco IOS data path debug messages.</td>
</tr>
<tr>
<td><code>debug cellular driver</code></td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td><code>debug cellular firmware</code></td>
<td>Displays Cisco IOS firmware information.</td>
</tr>
<tr>
<td><code>debug cellular messages management</code></td>
<td>Prints management path messages, such as CnS.</td>
</tr>
<tr>
<td><code>debug cellular messages virt-con</code></td>
<td>Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.</td>
</tr>
</tbody>
</table>
**debug cellular messages management**

To print management path messages, such as CnS, use the `debug cellular messages management` command in EXEC mode.

```
debug cellular slot/wic_slot/port messages management
```

### Syntax Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>slot/wic_slot/port</code></td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

### Command Default

None

### Command Modes

EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

Use this command for debugging purposes only.

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>debug cellular messages all</code></td>
<td>Prints all Cisco IOS driver debug messages.</td>
</tr>
<tr>
<td><code>debug cellular messages async</code></td>
<td>Debugs cellular async.</td>
</tr>
<tr>
<td><code>debug cellular messages data</code></td>
<td>Prints Cisco IOS data path debug messages.</td>
</tr>
<tr>
<td><code>debug cellular driver</code></td>
<td>Debugs the Cisco IOS driver.</td>
</tr>
<tr>
<td><code>debug cellular firmware</code></td>
<td>Displays Cisco IOS firmware information.</td>
</tr>
<tr>
<td><code>debug cellular messages virt-con</code></td>
<td>Redirects the Nios II console driver messages to display them in the Cisco IOS router console environment.</td>
</tr>
</tbody>
</table>
debug cellular messages oma-dm

To start OMA-DM debugging, use the **debug cellular messages oma-dm** command in privileged EXEC mode. This captures all the OMA DM control and status (CnS) packets.

**debug cellular slot/wic_slot/port messages oma-dm**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
</table>

**Command Default**
- None

**Command Modes**
- Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**
- None

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>show cellular oma-dm</strong></td>
<td>Displays an OMA-DM session details.</td>
</tr>
<tr>
<td><strong>cellular cdma activate oma-dm device config</strong></td>
<td>Starts a user initiated OMA-DM session to provision an account and profile update.</td>
</tr>
<tr>
<td><strong>cellular cdma activate oma-dm ni-alert</strong></td>
<td>Allows or denies a network initiated alert (NIA) queued in the modem.</td>
</tr>
<tr>
<td><strong>cellular cdma activate oma-dm prl-update</strong></td>
<td>Starts a user initiated OMA-DM session to get an over-the-air PRL update.</td>
</tr>
</tbody>
</table>
**show cellular all**

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

```
show cellular slot/wic_slot/port all
```

### Syntax Description

<table>
<thead>
<tr>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
</table>

### Command Default

None

### Command Modes

Privileged EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
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</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

### 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

This section contains:

- Sample Output for 3G-HWIC-GSM
- Sample Output for 3G-HWIC-CDMA

#### Sample Output for 3G-HWIC-GSM

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

```
routerr# show cellular 0/0/0 all
```

**Hardware Information**

```
              --------------------
Modem Firmware Version = U1_2_22MCAP G:/WORK
Modem Firmware built = 04/17/06
Hardware Version = E2
International Mobile Subscriber Identity (IMSI) = 001012345678901
International Mobile Equipment Identity (IMEI) = 352678010002779
Factory Serial Number (FSN) = S2128751274E2OK
Modem Status = Online
Current Modem Temperature = 28 deg C, State = Normal
```

**Profile Information**

```
              ---------------------
Profile 1 = INACTIVE*
----------
```
PDP Type = IPv4, Header Compression = OFF
Data Compression = OFF
Access Point Name (APN) = vpn.com
Authentication = CHAP
Username: wapuser1, Password: wap

* - Default profile

Data Connection Information
============================= Data Transmitted = 0 bytes, Received = 0 bytes
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

router#

Network Information
==================== Current Service Status = No service, Service Error = None
Current Service = Invalid
Packet Service = None
Packet Session Status = Inactive
Current Roaming Status = Home
Network Selection Mode = Automatic
Country = 0, Network =
  Mobile Country Code (MCC) = 0
  Mobile Network Code (MNC) = 0
  Location Area Code (LAC) = 0
  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

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

router#
Sample Output for 3G-HWIC-CDMA

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

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

Hardware Information
=====================
Modem Firmware Version = p2005600
Modem Firmware built = 11-14-06
Hardware Version = 1.0
Electronic Serial Number (ESN) = 0x6032688F
Preferred Roaming List (PRL) Version = 20224
Current Modem Temperature = 32 degrees Celsius

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

Account Information:
===================
Activation Date: Not available
Phone Number (MDN) : 9135938079
Mobile Station Identifier (MSID) : 9135938079

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

Data Connection Information
============================
Phone number of outgoing call =
HDR AT State = Idle, HDR Session State = Open
HDR Session Info:
  UATI (Hex) = 0084:0AC0:0000:0000:0000:0000:0000:05DC:A821:DCFC
  Color Code = 32, RATI = 0xFFFFFFF
```
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)

Network Information
=================================
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 15:12:18 2007

Radio Information
===================
1xRTT related info
-----------------
Current RSSI = -94 dBm, ECIO = -8 dBm
Current Channel Number = 50
Current Channel State = Acquired
Current Band Class = Band Class 1

HDR (1xEVDO) related info
-------------------------
Current RSSI = -83 dBm, ECIO = -0 dBm
Current Channel Number = 25
Current Band Class = Band Class 1
Sector ID (Hex) = 0084:0AC0:0000:0000:05DC: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 = 7

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

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cellular cdma activate otasp</td>
<td>Activates a cellular account using the over the air service provisioning (OTASP).</td>
</tr>
<tr>
<td>show cellular hardware</td>
<td>Displays the cellular modem hardware information.</td>
</tr>
<tr>
<td>show cellular network</td>
<td>Displays the cellular network (base station) information.</td>
</tr>
<tr>
<td>show cellular profile</td>
<td>Displays the cellular profile information.</td>
</tr>
</tbody>
</table>
### Command Description

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cellular radio</code></td>
<td>Displays the cellular modem radio statistics.</td>
</tr>
<tr>
<td><code>show cellular security</code></td>
<td>Displays the modem lock state.</td>
</tr>
<tr>
<td><code>show controllers cellular</code></td>
<td>Displays the SMS messages received by the cellular modem.</td>
</tr>
</tbody>
</table>
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 slot/wic_slot/port connection
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>slot/wic_slot/port</code></td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Default</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Privileged EXEC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command History</th>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td></td>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td></td>
<td>15.1(1)T</td>
<td>This command was integrated into Cisco IOS Release 15.1(1)T.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage Guidelines</th>
<th>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.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
<th>This section contains:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Sample Output for 3G-HWIC-GSM</td>
</tr>
<tr>
<td></td>
<td>• Sample Output for 3G-HWIC-CDMA</td>
</tr>
</tbody>
</table>

**Sample Output for 3G-HWIC-GSM**

The following is sample output for slot 1, wic 0, port 1.

```
router# show cellular 1/0/1 connection
Data Transmitted = 1066807500 bytes, Received = 1066807500 bytes
Profile 1, Packet Session Status = ACTIVE
  IP address = 1.5.97.2
Profile 2, Packet Session Status = INACTIVE
  Inactivity Reason = Normal inactivate state
```

Table 12 describes each output field.
Table 12  Output Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Transmitted</td>
<td>Total data transmitted by the modem. Can be cleared by the clear counters command.</td>
</tr>
<tr>
<td>Data Received</td>
<td>Total data received by the modem. Can be cleared by the clear counters command.</td>
</tr>
<tr>
<td>Profile &lt;profile number&gt;</td>
<td>Indicates the profiles configured in the modem. A total of 16 profiles can be configured.</td>
</tr>
<tr>
<td>Packet Session Status</td>
<td>Packet Data Protocol (PDP) session status of the profile. Active when the call is made and PDP context has become active in the modem.</td>
</tr>
<tr>
<td>IP Address</td>
<td>IP address of the cellular interface received during IPCP negotiation.</td>
</tr>
<tr>
<td>Inactivity Reason</td>
<td>Reason why the profile is inactive.</td>
</tr>
</tbody>
</table>

Sample Output for 3G-HWIC-CDMA

The following example is sample output for slot 0, WIC slot 0, 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 13 describes each output field.

Table 13  Description of Sample Output for CDMA

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone number of outgoing call</td>
<td>Shows the phone number of the data call dialed.</td>
</tr>
<tr>
<td>HDR AT State</td>
<td>Indicates the AT state. Will show as CONNECTED when the CONNECT is received from the modem while dialing out. This is valid only for 1xEVDO.</td>
</tr>
</tbody>
</table>
### Table 13  Description of Sample Output for CDMA (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDR Session State</td>
<td>Will indicate as OPEN once the HDR session is established. This is valid only for 1xEVDO</td>
</tr>
<tr>
<td>UATI</td>
<td>Unicast Access Terminal Identifier (UATI) obtained by the modem or access terminal (AT) from the base station during session establishment.</td>
</tr>
<tr>
<td>Color Code</td>
<td>HDR session color code for the sector.</td>
</tr>
<tr>
<td>RATI</td>
<td>HDR Random Access Terminal Identifier used for opening a session.</td>
</tr>
<tr>
<td>Session Duration</td>
<td>HDR session duration in milliseconds.</td>
</tr>
<tr>
<td>Session Start</td>
<td>Phone uptime in units of milliseconds at session start.</td>
</tr>
<tr>
<td>Session End</td>
<td>Phone uptime in units of milliseconds at session end.</td>
</tr>
<tr>
<td>Authentication Status</td>
<td>Modem or access terminal authentication status with the base station.</td>
</tr>
<tr>
<td>HDR DRC Value</td>
<td>The data rate channel value specified by the access terminal. The access terminal uses DRC value to specify the requested transmission rate</td>
</tr>
<tr>
<td>DRC Cover</td>
<td>DRC cover value used by the access terminal to specify the transmitting sector.</td>
</tr>
<tr>
<td>RRI</td>
<td>Indicates the rate of the reverse traffic data channel.</td>
</tr>
<tr>
<td>Current Transmitted</td>
<td>Number of bytes transmitted by the modem to the base station. This will be cleared when the call is disconnected.</td>
</tr>
<tr>
<td>Current Received</td>
<td>Number of bytes received by the modem from the base station. This will be cleared when the call is disconnected.</td>
</tr>
<tr>
<td>Current call status</td>
<td>Current call status of the modem, such as CONNECTED, DISCONNECTED, DORMANT, CONNECTING, or ERROR.</td>
</tr>
<tr>
<td>Privacy Mode</td>
<td>Current privacy status of the call in progress.</td>
</tr>
<tr>
<td>Service Option</td>
<td>Service option for the call in progress.</td>
</tr>
<tr>
<td>Current Call Duration</td>
<td>Duration of the call in progress. A call status of DISCONNECTED displays the call duration of the last call.</td>
</tr>
<tr>
<td>Total Transmitted</td>
<td>Total number of kilobytes transmitted from the modem. This will be cleared by the <strong>clear counters</strong> command.</td>
</tr>
<tr>
<td>Total Received</td>
<td>Total number of kilobytes received by the modem. This will be cleared by the <strong>clear counters</strong> command.</td>
</tr>
</tbody>
</table>
### Table 13  Description of Sample Output for CDMA (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Call Duration</td>
<td>Total duration of calls made from the modem. This will be updated when the current call in progress is disconnected.</td>
</tr>
<tr>
<td>Current Call State</td>
<td>Indicates the type of call made.</td>
</tr>
<tr>
<td>Last Call Disconnect Reason</td>
<td>Indicates why the last call was disconnected.</td>
</tr>
<tr>
<td>Last Connection Error</td>
<td>Indicates the error code if the call status indicates an error.</td>
</tr>
<tr>
<td>Mobile IP Error Code</td>
<td>Indicates the error code in accordance with RFC-2002 if the call is a mobile IP call.</td>
</tr>
</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cellular cdma activate manual</code></td>
<td>Manually activates a cellular account using the over-the-air service (OTA) procedure.</td>
</tr>
<tr>
<td><code>show cellular hardware</code></td>
<td>Displays the cellular modem hardware information.</td>
</tr>
<tr>
<td><code>show cellular network</code></td>
<td>Displays the cellular network (base station) information.</td>
</tr>
<tr>
<td><code>show cellular profile</code></td>
<td>Displays the cellular profile information.</td>
</tr>
<tr>
<td><code>show cellular radio</code></td>
<td>Displays the cellular modem radio statistics.</td>
</tr>
<tr>
<td><code>show cellular security</code></td>
<td>Displays the modem lock state.</td>
</tr>
<tr>
<td><code>show controllers cellular</code></td>
<td>Displays HWIC hardware- and driver-specific information.</td>
</tr>
</tbody>
</table>
show cellular connection personality

To display the negotiated personalities when the 1xEVDO-Rev A service is acquired by the modem, use the `show cellular connection personality` command in EXEC mode.

```
show cellular slot/wic_slot/port connection personality
```

**Syntax Description**

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

**Command Default**

There is no default for this command.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

None

**Examples**

The following example shows output for code division multiple access (CDMA) for slot 0, WIC slot 0, port 0:

```
c2800#show cellular 0/0/0 connection personality
No Active Personalities Negotiated
c2800#
```

**Related Commands**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>cellular cdma activate iota</code></td>
<td>Activates a cellular account using the internet over the air service (OTA) procedure.</td>
</tr>
<tr>
<td><code>cellular cdma activate manual</code></td>
<td>Manually activates a cellular account using the over the air service (OTA) procedure or over the air service provisioning (OTASP).</td>
</tr>
<tr>
<td><code>cellular cdma activate otasp</code></td>
<td>Activates a cellular account using the over the air service (OTA) procedure or over the air service provisioning (OTASP).</td>
</tr>
<tr>
<td><code>debug cellular messages all</code></td>
<td>Displays the cellular modem hardware information.</td>
</tr>
<tr>
<td><code>debug cellular messages data</code></td>
<td>Displays the cellular network (base station) information.</td>
</tr>
<tr>
<td><code>debug cellular messages management</code></td>
<td>Displays the cellular profile information.</td>
</tr>
<tr>
<td><code>show cellular radio</code></td>
<td>Displays the cellular modem radio statistics.</td>
</tr>
<tr>
<td><code>show cellular security</code></td>
<td>Displays the modem lock state.</td>
</tr>
<tr>
<td><code>show controllers cellular</code></td>
<td>Displays the SMS messages received by the cellular modem.</td>
</tr>
</tbody>
</table>
show cellular hardware

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

`show cellular slot/wic_slot/port hardware`

**Syntax Description**
- `slot/wic_slot/port`: Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.

**Command Default**
None

**Command Modes**
Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**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**
This section contains:
- Sample Output for HWIC-3G-GSM
- Sample Output for HWIC-3G-CDMA

**Sample Output for HWIC-3G-GSM**
The following example shows output for slot 0, WIC slot 0, port 0:

```
router# show cellular 0/0/0 hardware
Modem Firmware Version = H1_0_0_1MCAP C:/WS/
Modem Firmware built = 09/08/06
Hardware Version = 1.0
International Mobile Subscriber Identity (IMSI) = <number>
International Mobile Equipment Identity (IMEI) = <number>
Factory Serial Number (FSN) = X2819460254100D
Modem Status = Online
Current Modem Temperature = 33 deg C, State = Normal
```
Table 14  Output Description for show cellular hardware command

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem Firmware Version</td>
<td>Firmware version of the modem.</td>
</tr>
<tr>
<td>Modem Firmware Built</td>
<td>Date firmware was built in mm-dd-yy format.</td>
</tr>
<tr>
<td>Hardware Version</td>
<td>Modem hardware version.</td>
</tr>
<tr>
<td>International Mobile Subscriber Identity (IMSI)</td>
<td>IMSI is stored in the SIM. IMSI consists of MCC (mobile country code, 3 digits), MNC (mobile network code, 3 digits for N. America and 2 digits for rest of the world) and MSIN (mobile station identification number). The MCC and MNC in the IMSI identify the subscribers in the PLMN (Public Land Mobile Network).</td>
</tr>
<tr>
<td>International Mobile Equipment Identity (IMEI)</td>
<td>Number that uniquely identifies the modem in a GSM/UMTS network.</td>
</tr>
<tr>
<td>Factory Serial Number (FSN)</td>
<td>Unique serial number of the modem.</td>
</tr>
<tr>
<td>Modem Status</td>
<td>Will be online if the modem has booted up correctly; otherwise will be offline and the modem will not be usable.</td>
</tr>
<tr>
<td>Current Modem Temperature</td>
<td>Radio temperature of the modem in degrees Celsius. State is normal when temperature is between 5 to 185°F (-15° to 85°C). If state reaches critical 226.4°F (108°C), the modem will be shutdown.</td>
</tr>
</tbody>
</table>

Sample Output for HWIC-3G-CDMA

The following example shows output for slot 0, WIC slot 0, port 0:

```
router# show cellular 0/0/0 hardware

Modem Firmware Version = p2005600
Modem Firmware built = 11-14-06
Hardware Version = 1.0
Electronic Serial Number (ESN) = 0x6032688F
Preferred Roaming List (PRL) Version = 20224
Current Modem Temperature = 32 degrees Celsius
```

Table 15 describes each output field.

Table 15  Output Description for show cellular hardware command

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem Firmware Version</td>
<td>Firmware version of the modem.</td>
</tr>
<tr>
<td>Modem Firmware Built</td>
<td>Date firmware was built in mm-dd-yy format.</td>
</tr>
<tr>
<td>Hardware Version</td>
<td>Modem hardware version.</td>
</tr>
<tr>
<td>Electronic Serial Number</td>
<td>Unique serial number of the modem.</td>
</tr>
</tbody>
</table>
### Output Description for `show cellular hardware` command (continued)

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preferred Roaming List (PRL) Version</td>
<td>PRL version is unique to a service provider. This indicates to the modem which channels the modem should scan.</td>
</tr>
<tr>
<td>Current Modem Temperature</td>
<td>Radio temperature of the modem in degrees Celsius.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cellular radio</code></td>
<td>Displays the cellular modem radio statistics.</td>
</tr>
<tr>
<td><code>show cellular security</code></td>
<td>Displays the modem lock state.</td>
</tr>
<tr>
<td><code>show controllers cellular</code></td>
<td>Displays HWIC hardware- and driver-specific information.</td>
</tr>
</tbody>
</table>
show cellular network

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

```
show cellular slot/wic_slot/port network
```

**Syntax Description**

```
slot/wic_slot/port
```

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

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**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**

This section contains:

- Sample Output for HWIC-3G-GSM
- Sample Output for HWIC-3G-CDMA

**Sample Output for HWIC-3G-GSM**

The following example shows output for HWIC-3G-GSM in slot 0, WIC slot 0, port 0:

```
router# show cellular 0/0/0 network
Current Service Status = Normal, Service Error = None
Current Service = Combined
Packet Service = UMTS/WCDMA (Attached)
Packet Session Status = Inactive
Current Roaming Status = Roaming
Network Selection Mode = Automatic
Country = USA, Network = CINGULAR
Mobile Country Code (MCC) = 310
Mobile Network Code (MNC) = 380
Location Area Code (LAC) = 56997
Routing Area Code (RAC) = 253
Cell ID = 4503
Primary Scrambling Code = 169
PLMN Selection = Automatic
Registered PLMN = Cingular, Abbreviated =
Service Provider =
```
Table 16 describes each output field.

**Table 16  Output Description for show cellular hardware command for GSM**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Service Status</td>
<td>Indicates whether service is available.</td>
</tr>
<tr>
<td>Current Service Error</td>
<td>Shows the error in case there is no service</td>
</tr>
<tr>
<td>Current Idle Digital Mode</td>
<td>Idle mode of the modem.</td>
</tr>
<tr>
<td>Packet Service</td>
<td>Indicates the type of service available. For normal operation, the modem should be attached.</td>
</tr>
<tr>
<td>Packet Session Status</td>
<td>Status of PDP session. When data transfer is taking place, packet session will be active.</td>
</tr>
<tr>
<td>Current Roaming Status</td>
<td>Indicates whether the modem is in the home network or is roaming.</td>
</tr>
<tr>
<td>Network Selection Mode</td>
<td>Can be manual selection mode or automatic selection mode. Set to automatic by default.</td>
</tr>
<tr>
<td>Country</td>
<td>Country string given by the base station.</td>
</tr>
<tr>
<td>Network</td>
<td>Network string given by the base station.</td>
</tr>
<tr>
<td>Mobile Country Code</td>
<td>Country code given by the base station. The modem will be in the home network only if the country code given by the base station matches the MCC of the IMSI and the network code given by the base station matches the MNC of the IMSI.</td>
</tr>
<tr>
<td>Mobile Network Code</td>
<td>Network code given by the base station. The modem will be in the home network only if the country code given by the base station matches the MCC of the IMSI and the network code given by the base station matches the MNC of the IMSI.</td>
</tr>
<tr>
<td>Location Area Code</td>
<td>LAC given by the base station.</td>
</tr>
<tr>
<td>Routing Area Code</td>
<td>RAC given by the base station.</td>
</tr>
<tr>
<td>Cell ID</td>
<td>Cell ID given by the base station.</td>
</tr>
<tr>
<td>PLMN Selection</td>
<td>Default is automatic.</td>
</tr>
</tbody>
</table>

**Sample Output for HWIC-3G-CDMA**

The following example shows output for slot 0, WIC slot 0, 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 17: Output Description for show cellular hardware command for CDMA

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Service</td>
<td>Service attached by the modem.</td>
</tr>
<tr>
<td>Current Roaming Status</td>
<td>Indicates whether the modem is in the home network or roaming.</td>
</tr>
<tr>
<td>Current Idle Digital Mode</td>
<td>Idle mode of the modem.</td>
</tr>
<tr>
<td>Current System Identifier</td>
<td>SID received by the modem (applicable only for 1xRTT).</td>
</tr>
<tr>
<td>Current Network Identifier</td>
<td>NID received by the modem (applicable only for 1xRTT).</td>
</tr>
<tr>
<td>Current BSS Longitude/Latitude</td>
<td>Geographic location of the BSS (if this information is received from the BSS).</td>
</tr>
<tr>
<td>Current System Time</td>
<td>System time received from the base station.</td>
</tr>
</tbody>
</table>

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show cellular radio</td>
<td>Displays the cellular modem radio statistics.</td>
</tr>
<tr>
<td>show cellular security</td>
<td>Displays the modem lock state.</td>
</tr>
<tr>
<td>show controllers cellular</td>
<td>Displays HWIC hardware and driver-specific information.</td>
</tr>
</tbody>
</table>
show cellular oma-dm

To display an OMA-DM session details, use the `show cellular oma-dm` command in privileged EXEC mode.

```
show cellular slot/wic_slot/port oma-dm
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Default</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Privileged EXEC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command History</th>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.4(22)YB1</td>
<td>This command was introduced.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage Guidelines</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
</tr>
</thead>
</table>

This section contains sample output for `show cellular slot/wic_slot/port oma-dm` command:

**Sample Output for HWIC-3G-CDMA**

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

```
Router#sh cellular 0/3/0 oma-dm
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 = Not supported, Disabled
Network-Initiated = Not supported, Disabled
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
Router#

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cellular cdma activate oma-dm</strong></td>
<td>Starts a user initiated OMA-DM session to provision an account and profile update.</td>
</tr>
<tr>
<td>device config</td>
<td>Starts OMA-DM debugging.</td>
</tr>
<tr>
<td><strong>cellular cdma activate oma-dm</strong></td>
<td>Allows or denies a network initiated alert (NIA) queued in the modem.</td>
</tr>
<tr>
<td><strong>cellular cdma activate oma-dm</strong></td>
<td>Starts a user initiated OMA-DM session to get an over-the-air PRL update.</td>
</tr>
<tr>
<td>prl-update</td>
<td></td>
</tr>
<tr>
<td><strong>debug cellular messages oma-dm</strong></td>
<td></td>
</tr>
</tbody>
</table>
show cellular profile

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

```
show cellular slot/wic_slot/port profile <profile number> | all
```

**Syntax Description**

- `slot/wic_slot/port`  Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.
- `profile number`  Profile number for the profile to be displayed.
- `all`  Displays information of all profiles in the modem. The maximum number of supported profiles is 6.

**Note**

In case of HWIC-3G-CDMA-V, only one profile is supported, so only one profile is displayed.

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
<tr>
<td>12.4(22)YB1</td>
<td>This command was modified to display all profiles in the modem.</td>
</tr>
</tbody>
</table>

**Usage Guidelines**

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

**Examples**

This section contains:

- Sample Output for HWIC-3G-GSM
- Sample Output for HWIC-3G-CDMA

**Sample Output for HWIC-3G-GSM**

The following example shows output for HWIC-3G-GSM for slot 0, WIC slot 1, port 1:

```
router# show cellular 0/1/1 profile
Profile 1 = ACTIVE
---------
PDP Type = IPv4, Header Compression = ON
Data Compression = ON
```
PDP address = 0x7F000201
Access Point Name (APN) = enzo.cisco.com
Authentication = CHAP
Username: cisco, Password: lab
Primary DNS address = 127.0.2.1
Source Address = 127.0.2.1 255.255.255.0

Profile 2 = INACTIVE
---------
PDP Type = IPv4, Header Compression = ON
Data Compression = ON
PDP address = 0x7F000202
Access Point Name (APN) = enzo.cingular.com
Authentication = CHAP
Username: cisco, Password: lab
Primary DNS address = 127.0.2.1
Source Address = 127.0.2.2 255.255.255.0

### Table 18  Field Descriptions for show cellular profile command

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profile &lt;number&gt;</td>
<td>Shows whether a particular profile is ACTIVE or INACTIVE. The profile is ACTIVE when the PDP context is active. This happens when a data call is successfully established.</td>
</tr>
<tr>
<td>PDP Type</td>
<td>Indicates the packet data protocol (PDP) type. Supported type is IPv4.</td>
</tr>
<tr>
<td>PDP Address</td>
<td>Shows the IP address assigned for the PDP context during PPP negotiation.</td>
</tr>
<tr>
<td>Access Point Name</td>
<td>Access Point Name for the profile. This information is provided by the service provider.</td>
</tr>
<tr>
<td>Authentication</td>
<td>PPP authentication supported. CHAP and PAP are supported. The type of authentication to be used is provided by the service provider.</td>
</tr>
<tr>
<td>Username</td>
<td>Username to be used for PPP authentication. This information is provided by the service provider.</td>
</tr>
<tr>
<td>Password</td>
<td>Password to be used for PPP authentication. This information is provided by the service provider.</td>
</tr>
</tbody>
</table>

### Sample Output for HWIC-3G-CDMA

The following example shows output for HWIC-3G-CDMA for slot 0, WIC slot 1, port 1:

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

Electronic Serial Number (ESN) = 0x6032688F [09603303567]
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 19 describes the output fields from the command.

Table 19   Field Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Serial Number</td>
<td>A unique serial number for the CDMA modem displayed in decimal and hexadecimal formats.</td>
</tr>
<tr>
<td>Modem Activated</td>
<td>Indicates the activation status of the modem. Yes indicates that the modem is activated on the carrier network.</td>
</tr>
<tr>
<td>Data Profile</td>
<td>A 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.</td>
</tr>
<tr>
<td>ProvDate</td>
<td>Date the modem was provisioned, in yyyy/mm/dd format.</td>
</tr>
<tr>
<td>MDN</td>
<td>Mobile Directory Number assigned to the modem by the carrier during provisioning.</td>
</tr>
<tr>
<td>MIN</td>
<td>Mobile Identity Number assigned to the modem by the carrier during provisioning.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cellular cdma activate manual</td>
<td>Manually activates a cellular account using the over-the-air service (OTA) procedure.</td>
</tr>
<tr>
<td>cellular cdma activate otasp</td>
<td>Activates a cellular account using the over the air service provisioning (OTASP).</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><code>cellular cdma activate iota</code></td>
<td>Provisions data profile using Internet-based over-the-air provisioning (IOTA).</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>IOTA is supported only with certain wireless service providers. Please check with your wireless service provider.</td>
</tr>
<tr>
<td><code>cellular cdma activate oma-dm</code></td>
<td>Starts a user-initiated OMA-DM session to provision an account.</td>
</tr>
<tr>
<td><code>device config</code></td>
<td></td>
</tr>
</tbody>
</table>
show cellular radio

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

```
show cellular slot/wic_slot/port radio [history <all | per-hour | per-min | per-sec>]
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
<tr>
<td>history</td>
<td>Displays the RSSI history.</td>
</tr>
<tr>
<td>all</td>
<td>Complete RSSI history.</td>
</tr>
<tr>
<td>per-hour</td>
<td>Per-hour RSSI history.</td>
</tr>
<tr>
<td>per-min</td>
<td>Per-minute RSSI history.</td>
</tr>
<tr>
<td>per-sec</td>
<td>Per-second RSSI history.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Command Default</th>
<th>None</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command Modes</th>
<th>Privileged EXEC</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Command History</th>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td></td>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage Guidelines</th>
<th>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.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Examples</th>
<th>This section contains:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample Output for HWIC-3G-GSM</td>
</tr>
<tr>
<td></td>
<td>Sample Output for HWIC-3G-CDMA</td>
</tr>
</tbody>
</table>

**Sample Output for HWIC-3G-GSM**

The following example shows output for HWIC-3G-GSM in slot 0, WIC slot 0, port 0:

```
router# show cellular 0/0/0 radio
```

Current Band = WCDMA 1900, Channel Number = 9721
Current RSSI(RSCP) = -91 dBm
**Table 20**  
*Output Description for show cellular radio command for GSM*

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Band</td>
<td>GPRS/UMTS band to which the modem is attached.</td>
</tr>
<tr>
<td>Channel Number</td>
<td>Channel number to which the modem is attached.</td>
</tr>
<tr>
<td>Current RSSI</td>
<td>Current radio signal strength on the modem. (-125 dbm indicates no signal.)</td>
</tr>
</tbody>
</table>

**Sample Output for HWIC-3G-CDMA**

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

```
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 21**  
*Output Description for show cellular radio command for HWIC-3G-CDMA*

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

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show cellular all</code></td>
<td>Displays the consolidated information about the modem.</td>
</tr>
<tr>
<td><code>show controllers cellular</code></td>
<td>Displays HWIC-hardware and driver-specific information.</td>
</tr>
</tbody>
</table>
**show cellular security**

To display the SIM status (only for HWIC-3G-GSM) and modem lock state, use the *show cellular security* command in privileged EXEC mode.

```
show cellular slot/wic_slot/port security
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>slot/wic_slot/port</code></td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**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**

This section contains:

- Sample Output for HWIC-3G-GSM
- Sample Output for HWIC-3G-CDMA

**Sample Output for HWIC-3G-GSM**

The following example shows output for an HWIC-3G-GSM in slot 0, WIC slot 0, port 0:

```
router# show cellular 0/0/0 security
Card Holder Verification (CHV1) ENABLED
SIM Status = OK
SIM User Operation Required = CHV1
Number of Retries remaining = 3
```

Table 22 describes the output from this command:

<table>
<thead>
<tr>
<th>Filed</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Holder Verification</td>
<td>If enabled, access to the SIM is restricted.</td>
</tr>
<tr>
<td>SIM Status</td>
<td>Indicates whether the SIM is present or removed from the SIM socket.</td>
</tr>
</tbody>
</table>
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA, HWIC-3G-CDMA-x)

Table 22 Output Description (continued)

<table>
<thead>
<tr>
<th>Filed</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM User Operation Required</td>
<td>If the SIM is protected (for example, because of CHV1 enabled), it will indicate the type of user operation required.</td>
</tr>
<tr>
<td>Number of Retries Remaining</td>
<td>Indicates the number of attempts remaining in case the SIM is locked. If the number of retries becomes zero, the SIM is blocked and becomes unusable.</td>
</tr>
</tbody>
</table>

Sample Output for HWIC-3G-CDMA

The following example shows output for an HWIC-3G-CDMA in slot 0, WIC slot 0, port 0:

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

Table 23 describes the output for this command.

Table 23 Output Description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem PIN Security</td>
<td>If the modem is locked, you cannot make calls without unlocking.</td>
</tr>
<tr>
<td>Power-up Lock</td>
<td>Shows whether the modem will be locked on power-up.</td>
</tr>
</tbody>
</table>

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show cellular all</td>
<td>Displays the consolidated information about the modem.</td>
</tr>
</tbody>
</table>
show controllers cellular

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

```
show controllers cellular slot/wic_slot/port
```

### Syntax Description

<table>
<thead>
<tr>
<th>slot/wic_slot/port</th>
<th>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</th>
</tr>
</thead>
</table>

### Command Default

There is no default for this command.

### Command Modes

Privilege EXEC

### Command History

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
<td>This command was introduced.</td>
</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

### Usage Guidelines

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

### Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show interfaces cellular</td>
<td>Displays statistics for the cellular interfaces.</td>
</tr>
<tr>
<td>show run interface cellular</td>
<td>Displays the current running configuration for the cellular interface.</td>
</tr>
</tbody>
</table>
**show interfaces cellular**

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

```
show interfaces cellular slot/wic_slot/port
```

<table>
<thead>
<tr>
<th>Syntax Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>slot/wic_slot/port</td>
<td>Numeric values that indicate the router slot, WAN interface card (WIC) slot, and port.</td>
</tr>
</tbody>
</table>

**Command Default**

There is no default for this command.

**Command Modes**

EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
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</tr>
<tr>
<td>12.4(15)T</td>
<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**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**

This section contains:

- Sample Output for 3G-HWIC-GSM
- Sample Output for 3G-HWIC-CDMA

**Sample Output for HWIC-3G-GSM**

The following example shows the cellular interface statistics for HWIC-3G-GSM in slot 0, WIC slot 0, port 0 for GSM:

```
router# show interfaces cellular 0/0/0
Cellular0/0/0 is up, line protocol is up
    Hardware is HSDPA/UMTS/EDGE/GPRS-850/900/1800/1900/2100MHz
    Internet address is 1.5.97.2/32
    MTU 1500 bytes, BW 384 Kbit, RXBW 2400000 Kbit, DLY 100000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
    Encapsulation PPP, LCP Open
    Open: IPCP, loopback not set
    Keepalive not set
    Time to interface disconnect: idle 3w3d
    Last input 00:20:21, output 00:20:21, output hang never
    Last clearing of "show interface" counters 00:00:01
    Input queue: 1/75/0/0 (size/max/drops/flushes); Total output drops: 0
    Queueing strategy: weighted fair
    Output queue: 0/1000/64/0 (size/max total/threshold/drops)
```
Configuring 3G Wireless for Modular and Fixed Cisco Integrated Services Routers (HWIC-3G-CDMA and HWIC-3G-CDMA-x)

show interfaces cellular

The following example shows the output for an HWIC-3G-CDMA in slot 0, WIC slot 0, port 0 for the show interfaces cellular command.

```
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
```

Sample Output for HWIC-3G-CDMA

Related Commands

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>show cellular radio</td>
<td>Displays the cellular modem radio statistics.</td>
</tr>
<tr>
<td>show controllers cellular</td>
<td>Displays HWIC hardware and driver-specific information.</td>
</tr>
<tr>
<td>show run interface cellular</td>
<td>Displays the current running configuration for the cellular interface.</td>
</tr>
</tbody>
</table>
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 slot/wic_slot/port
```

**Syntax Description**

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

**Command Default**

There is no default for this command.

**Command Modes**

Privileged EXEC

**Command History**

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.4(11)XV</td>
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<td>This command was integrated into Cisco IOS Release 12.4(15)T.</td>
</tr>
</tbody>
</table>

**Examples**

The following example shows the output of the command for 3G HWIC in slot 0, WIC slot 0, port 0:

```
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**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>show controllers cellular</code></td>
<td>Displays HWIC hardware and driver-specific information.</td>
</tr>
<tr>
<td><code>show interfaces cellular</code></td>
<td>Displays statistics for the cellular interfaces.</td>
</tr>
</tbody>
</table>
Troubleshooting Tips

If you are encountering issues with the working of the 3G wireless Modular and Fixed Cisco ISRs, this section will help you troubleshoot and pinpoint the cause of failure.

Verifying Configuration

To verify your configuration and to make sure that your connection is up and running, follow these step:

**Step 1** After creating a profile with the `create cellular profile` command, send a ping from a router or attached host.

**Step 2** If you do not get any response, to find where failure is occurring, run the following debug commands:

- `debug chat script`
- `debug PPP negotiation`
- `show cellular all`
- `show interface cellular`
- `show running-config`
- `show controllers cellular`

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

Checking Signal Strength

If the RSSI level is very low, for example, less than -110 dBm, it means one of the following:

- Your antenna is not connected
- The antenna is not working properly
- There is no service in your area

If all the above are connected and working as they should, contact your system administrator.

Call Setup Using CHAT Script

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

```
router# ping www.yahoo.com
```

```
Debugs enabled:
debug modem
debup chat
debug ppp negotiation
debug ppp event
debup ppp error
```

```
router# ping www.yahoo.com
```
Translating "www.yahoo.com"...domain server (255.255.255.255)
*Mar 1 23:42:57.398: CHAT0/1/0: Attempting async line dialer script
*Mar 1 23:42:57.398: CHAT0/1/0: process started
*Mar 1 23:42:57.402: CHAT0/1/0: Asserting DTR
*Mar 1 23:42:57.402: CHAT0/1/0: Chat script sprint started
*Mar 1 23:42:57.402: CHAT0/1/0: Sending string: atdt#777
*Mar 1 23:42:58.710: CHAT0/1/0: process started
*Mar 1 23:42:58.710: CHAT0/1/0: Expecting string: CONNECT
*Mar 1 23:42:58.710: CHAT0/1/0: Completed match for expect: CONNECT
*Mar 1 23:42:58.878: TTY0/1/0: no timer type 1 to destroy
*Mar 1 23:42:58.878: TTY0/1/0: no timer type 0 to destroy
*Mar 1 23:43:00.878: %LINK-3-UPDOWN: Interface Cellular0/1/0, changed state to up
*Mar 1 23:43:00.878: Ce0/1/0 PPP: Using dialer call direction
*Mar 1 23:43:00.878: Ce0/1/0 PPP: Treating connection as a callout
*Mar 1 23:43:00.878: Ce0/1/0 PPP: Session handle[CD00000E] Session id[5]
*Mar 1 23:43:00.878: Ce0/1/0 PPP: No remote authentication for call-out
*Mar 1 23:43:00.878: Ce0/1/0 LCP: O CONFREQ [Closed] id 5 len 20
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: MagicNumber 0x4597FB75 (0x05064597FB75)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: PFC (0x0702)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACFC (0x0802)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: I CONFREQ [REQsent] id 12 len 20
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACCM 0x00000000 (0x020600000000)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: MagicNumber 0x7F576333 (0x05067F576333)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: PFC (0x0702)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACFC (0x0802)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: O CONFACK [REQsent] id 12 len 20
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACCM 0x00000000 (0x020600000000)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: MagicNumber 0x7F576333 (0x05067F576333)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: PFC (0x0702)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACFC (0x0802)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: I CONFACK [ACKsent] id 5 len 20
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACCM 0x000A0000 (0x0206000A0000)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: MagicNumber 0x4597FB75 (0x05064597FB75)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: PFC (0x0702)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: ACFC (0x0802)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: I CONFNAK [ACKsent] id 1 len 22
*Mar 1 23:43:00.878: Ce0/1/0 LCP: Address 70.12.159.189 (0x0306460C9FBD)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: PrimaryDNS 68.28.58.11 (0x8106441C3A0B)
*Mar 1 23:43:00.878: Ce0/1/0 LCP: SecondaryDNS 68.28.50.11 (0x8306441C320B)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: I CONFREQ [REQsent] id 4 len 10
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: Address 68.28.57.69 (0x0306441C3945)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: O CONFACK [REQsent] id 4 len 10
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: Address 68.28.57.69 (0x0306441C3945)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: I CONFNAK [ACKsent] id 1 len 22
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: Address 70.12.159.189 (0x0306460C9FBD)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: PrimaryDNS 68.28.58.11 (0x8106441C3A0B)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: SecondaryDNS 68.28.50.11 (0x8306441C320B)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: O CONFREQ [ACKsent] id 2 len 22
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: Address 70.12.159.189 (0x0306460C9FBD)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: PrimaryDNS 68.28.58.11 (0x8106441C3A0B)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: SecondaryDNS 68.28.50.11 (0x8306441C320B)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: I CONFACK [ACKsent] id 2 len 22
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: Address 70.12.159.189 (0x0306460C9FBD)
*Mar 1 23:43:00.878: Ce0/1/0 IPPCP: PrimaryDNS 68.28.58.11 (0x8106441C3A0B)
Modem Troubleshooting Using the Diagnostic Port

The RJ-45 port on the faceplate of the 3G wireless HWIC provides access to the debug port on the Sierra Wireless modem. By connecting an industry-standard diagnostic tool, such as 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 command to turn diagnostics on:

```
router# test cell-hwic slot/port/wic dm-port 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 the global configuration mode.
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