4G LTE Wireless WAN

The Cisco Fourth-Generation Long-Term Evolution (4G LTE) Wireless WAN (WWAN) offers a highly secure, simplified, and cost-effective WAN alternative to DSL or Frame Relay. In areas where terrestrial broadband services (cable, DSL, or T1) are not available or are expensive, 4G LTE WWAN connectivity can be a viable alternative. The Cisco 819 Series 4G LTE ISRs, Cisco C880 Series 4G LTE ISRs, and Cisco C890 Series 4G LTE ISRs support 4G LTE and 3G cellular networks and Cisco 880G series ISRs support 3G cellular networks.

4G LTE Support on Cisco 800 Series ISRs

Effective with Cisco IOS Release 15.2(4)M1, the multimode 4G LTE feature is supported on Cisco 819 Series 4G LTE ISRs. Cisco C880 Series 4G LTE ISRs, and Cisco C890 Series 4G LTE ISRs also support 4G LTE feature effective with Cisco IOS Release 15.4(3)T. Cisco 819 Series 4G LTE ISRs, Cisco C880 Series 4G LTE ISRs, and Cisco C890 Series 4G LTE ISRs support the following modes:

- 4G LTE—4G LTE mobile specification provides multi-megabit bandwidth, more efficient radio network, latency reduction, and improved mobility. LTE solutions target new cellular networks. These networks initially support up to 100 Mb/s peak rates in the downlink and up to 50 Mb/s peak rates in the uplink. The throughput of these networks is higher than the existing 3G networks.

- 3G Evolution High-Speed Packet Access (HSPA/HSPA+) Mode—HSPA is a UMTS-based 3G network. It supports High-Speed Downlink Packet Access (HSDPA) and High-Speed Uplink Packet Access (HSUPA) data for improved download and upload speeds. Evolution High-Speed Packet Access (HSPA+) supports Multiple Input/Multiple Output (MIMO) antenna capability.

- 3G Evolution-Data Optimized (EVDO or DOrA) Mode—EVDO is a 3G telecommunications standard for the wireless transmission of data through radio signals, typically for broadband Internet access. DOrA refers to EVDO Rev-A. EVDO uses multiplexing techniques including Code Division Multiple Access (CDMA), as well as Time Division Multiple Access (TDMA), to maximize both individual users' throughput and the overall system throughput.

How to Configure Cisco 800 Series 4G LTE ISRs

For instructions on how to configure the 4G LTE features on Cisco 819 Series 4G LTE ISRs, Cisco C880 Series 4G LTE ISRs, and Cisco C890 Series 4G LTE ISRs, see Cisco 4G LTE Software Installation Guide.

Note   For Cisco 800 Series 4G LTE ISRs, use slot "0" for all commands.

Configuration Examples for Cisco 800 Series 4G LTE ISRs

The following examples show how to configure the cellular interface for Cisco 800 Series 4G LTE ISRs:

Example: Basic Cellular Configuration

The following example shows how to configure the cellular interface to be used as primary and is configured as the default route:

```
chat-script lte "" "AT!CALL1" TIMEOUT 20 "OK"
!
!
controller Cellular 0
!
!
interface Cellular0
ip address negotiated
encapsulation slip
load-interval 30
dialer in-band
dialer idle-timeout 0
dialer string lte
dialer-group 1
no peer default ip address
async mode interactive
routing dynamic
!
dialer-list 1 protocol ip permit
!
line 3
script dialer lte
modem InOut
no exec
transport input all
transport output all
!
```

Example: Dialer-Watch Configuration without External Dialer Interface

The following example shows how to configure the dialer-watch without external dialer interface. The bold text is used to indicate important commands that are specific to the dialer-watch:

```
chat-script lte "" "AT!CALL1" TIMEOUT 20 "OK"
interface Cellular0
ip address negotiated
encapsulation slip
dialer in-band
dialer string LTE
dialer watch-group 1
```

```
async mode interactive
!
dialer watch-list 1 ip 5.6.7.8 0.0.0.0
dialer watch-list 1 delay route-check initial 60
dialer watch-list 1 delay connect 1
!
ip route 0.0.0.0 0.0.0.0 cellular 0
line 3
script dialer LTE
modem InOut
no exec
transport input all
transport output all
```

Example: Dialer-Persistent Configuration with External Dialer Interface

The following example shows how to configure the dialer-persistent with external dialer interface. The bold text is used to indicate important commands that are specific to the dialer-persistent:

```
interface Cellular0
ip address negotiated
encapsulation slip
dialer in-band
dialer pool-member 1
async mode interactive
routing dynamic
interface Dialer1
ip address negotiated
encapsulation slip
dialer pool 1
dialer idle-timeout 0
dialer string lte
dialer persistent
dialer-group 1
!
dialer-list 1 protocol ip permit
ip route 0.0.0.0 0.0.0.0 dialer 1
line 3
script dialer lte
modem InOut
no exec
transport input all
transport output all
```

Example: GRE Tunnel over Cellular Interface Configuration

The following example shows how to configure the static IP address when a GRE tunnel interface is configured with ip address unnumbered cellular interface:

Note The GRE tunnel configuration is supported only if the service providers provide a public IP address on the LTE interface.

Note For service providers using a private IP address, the point-to-point static GRE tunnel cannot be set up with a private IP address at one end and a public IP address on the other end.

```
interface Tunnel2
ip unnumbered <internal LAN interface GE0/0 etc.>
tunnel source Cellular0
tunnel destination a.b.c.d
```

```
interface Cellular0
ip address negotiated
encapsulation slip
no ip mroute-cache
dialer in-band
dialer string lte
dialer-group 1
async mode interactive
! traffic of interest through the tunnel/cellular interface
ip route x.x.x.x 255.0.0.0 Tunnel2
! route for the tunnel destination via cellular
ip route a.b.c.d 255.255.255.255 cellular 0
```

Modem Firmware Upgrade

For instructions on how to upgrade the modem firmware for Cisco 800 Series 4G LTE ISRs, see the "Modem Firmware Upgrade" section in Cisco 4G LTE Software Installation Guide.

Troubleshooting

For information on the troubleshooting procedures for Cisco 800 Series 4G LTE ISRs, see the "Troubleshooting" section in Cisco 4G LTE Software Installation Guide.

3G Support on Cisco 880G series ISRs

The Cisco 880G series Integrated Services Routers (ISR) with embedded third-generation (3G) wireless WAN (WWAN) option provide collaborative business solutions for secure data communication to small businesses and enterprises.

The Cisco 880G series ISRS are available for the following 3G standards:

- GSM and UMTS models based on third-generation partner project (3GPP) that support HSPA+, HSPA, UMTS, EDGE, and GPRS.
  For information on how to configure 3G HSPA or HSPA+ on Cisco 880G series ISRs, see the following links:

    ◦ http://www.cisco.com/en/US/docs/routers/access/1800/1861/software/feature/guide/mrwls_hspa.html

    ◦ http://www.cisco.com/en/US/docs/routers/access/1800/1861/software/feature/guide/mrwlsgsm.html

- CDMA models based on 3GPP2, that support EVDO, EVDO Rev A modes.
  For information on how to configure EVDO on Cisco 880G series ISRs, see the following links:

    ◦ http://www.cisco.com/en/US/docs/routers/access/1800/1861/software/feature/guide/mrwls_evdo.html

    ◦ http://www.cisco.com/en/US/docs/routers/access/1800/1861/software/feature/guide/mrwlcdma.html

For detailed information on supported Cisco 880G series models, see Cisco 880G series ISR data sheet at:

http://www.cisco.com/en/US/prod/collateral/routers/ps380/ps10082/data_sheet_c78-682548.html