



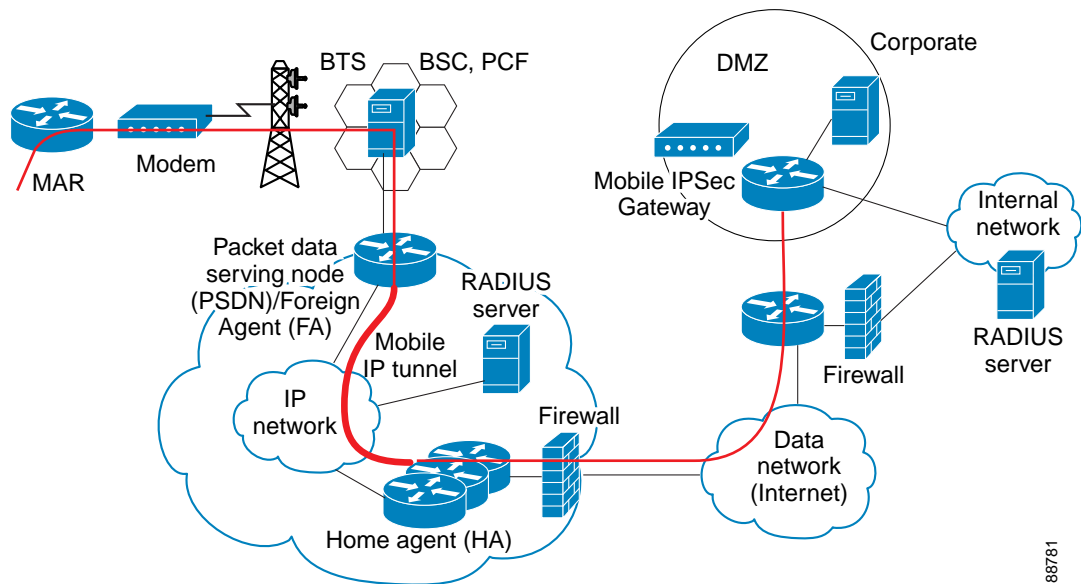
Modems in a Mobile Environment

This chapter describes roaming with external wireless modems.

Roaming with External Wireless Modems

General Packed Radio Service/Code Division Multiplex Access (GPRS/CDMA) modems provide the mobile access router with a Layer 2 roaming interface. The Mobile IP stack allows layer 3 roaming IP connectivity for the mobile access router. External modems are connected to a serial interface of the mobile access router. The serial interface should be running in asynchronous mode. Figure 13-1 shows a sample scenario in which the serial port of the mobile access router is connected to a CDMA modem.

Figure 13-1 Modem to Mobile Access Router Connection



88781

The mobile access router supports the following modems:

- Airlink Raven
- AnyDATA I-Port
- Wavecom

Configuration Example

The example configurations shown in [Figure 13-2](#) and [Figure 13-3](#) demonstrate the router's ability to roam back and forth between 802.11b and Cellular technologies. The browser-based applications and video move dynamically to and from the different technologies. The 1X technology provides approximately 60 Kbps. The Nextel provides approximately 20 Kbps, but the network provides for static IP addresses and private links back to the headquarters. Implementing IPsec VPN in the mobile access router provides a secure connection back to the headquarters through 802.11b technology.

Figure 13-2 IPsec VPN Connection

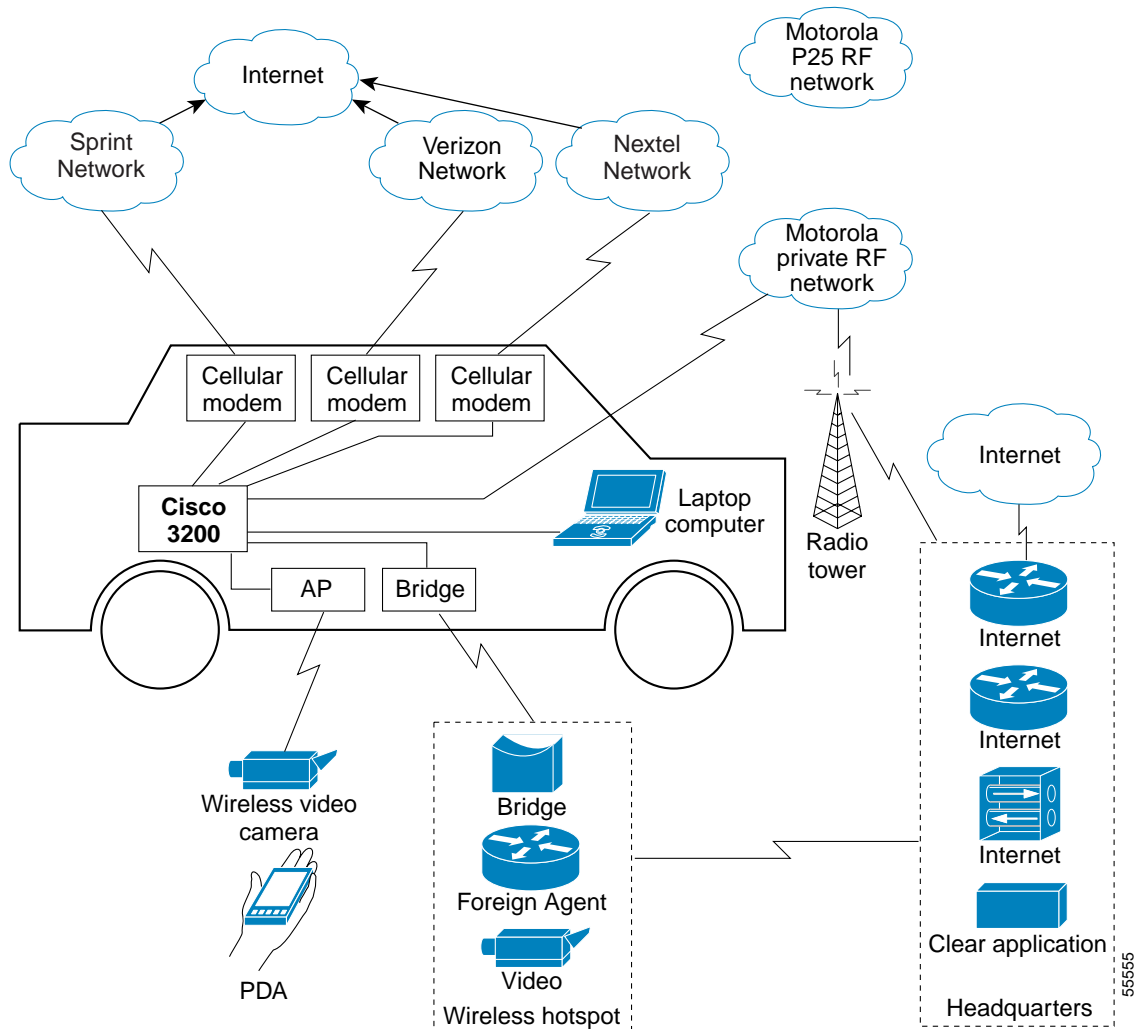
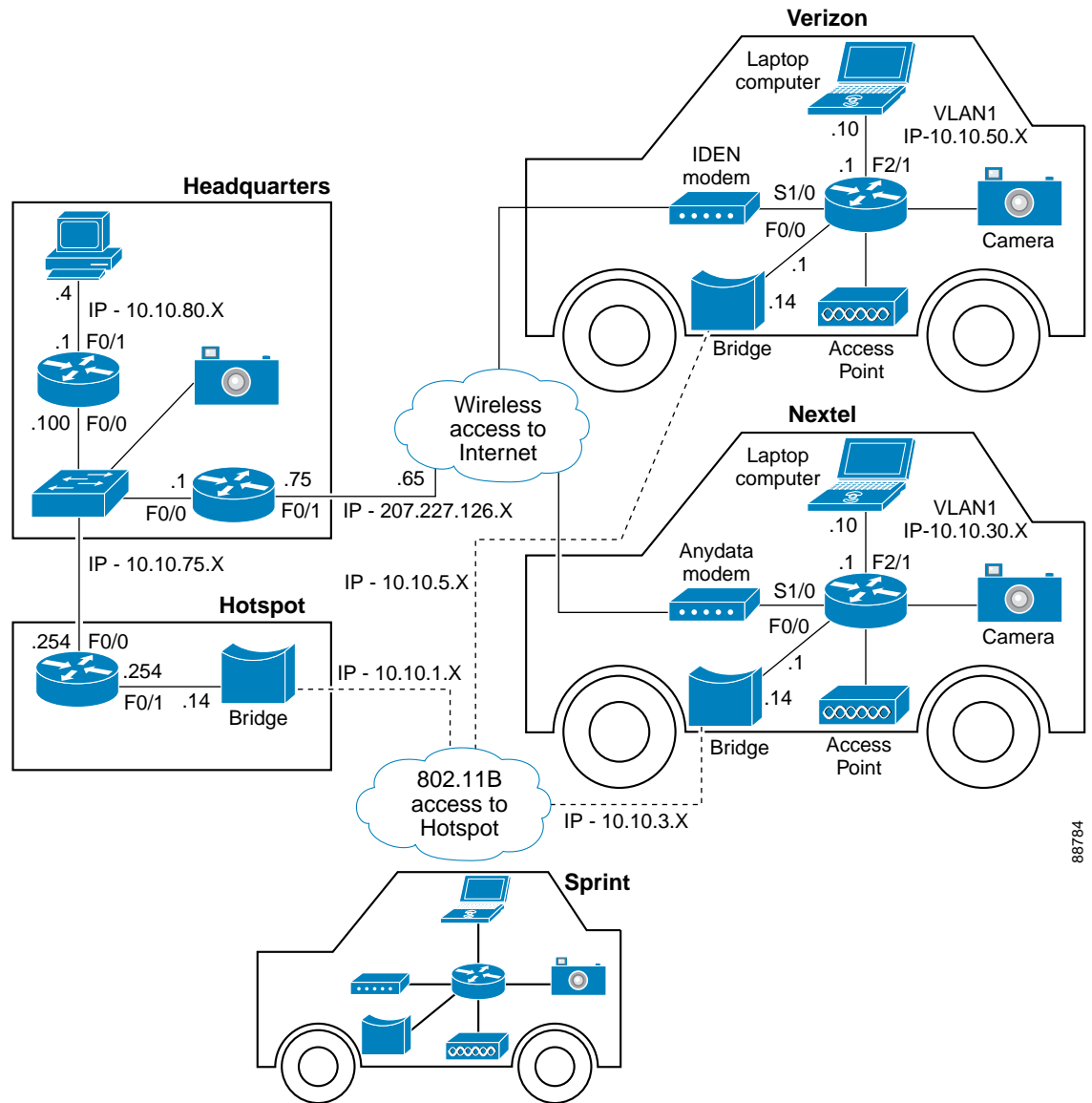


Figure 13-3 Wireless Internet Connection



88784

Example of a Mobile Access Router with Dialer Interface and GRE Mobile IP Tunneling

```

chat-script airlink-cdma "" "AT&C1&D2" TIMEOUT 30 OK "ATDT#19788" TIMEOUT 30 CONNECT
!
interface Loopback0
 ip address 15.4.1.2 255.255.255.0
!
interface FastEthernet0/0
 ip address 10.20.1.1 255.255.255.0
!

```

```

interface Serial1/0
  physical-layer async
  no ip address
  encapsulation ppp
  dialer in-band
  dialer pool-member 1
  dialer-group 1
!
interface Dialer0
  ip address negotiated
  ip nat outside
  ip mobile router-service roam
  ip mobile router-service collocated
  encapsulation ppp
  dialer pool 1
  dialer idle-timeout 0
  dialer string 1
  dialer persistent
  dialer-group 1
!
ip mobile secure home-agent 64.161.107.162 spi 100 key hex
12345678123456781234567812345678 algorithm md5 mode prefix-suffix
ip mobile router
  address 15.4.1.2 255.255.255.0
  home-agent 64.161.107.162
  reverse-tunnel
  tunnel mode gre
!
line 1
  exec-timeout 0 5
  flush-at-activation
  script dialer airlink-cdma
  modem InOut
  no exec
  transport input all
  stopbits 1
  speed 115200
  flowcontrol hardware
line aux 0
  exec-timeout 0 0
  speed 115200
line vty 0 4
  exec-timeout 0 0
  password cisco
  logging synchronous
  login

```

Example of a Mobile Access Router Without Dialer Interface

```

hostname 3200
!
chat-script airlink-cdma "" "AT&C1&D0" TIMEOUT 30 OK "ATDT#19788" TIMEOUT 30 CONNECT
!
interface Loopback0
  ip address 15.4.1.2 255.255.255.0
!
interface Serial1/0
  physical-layer async
  mtu 1450
  bandwidth 115200
  ip address negotiated
  ip mobile router-service roam
  ip mobile router-service collocated

```

```

encapsulation ppp
keepalive 900
dialer in-band
dialer idle-timeout 0
dialer string airlink-cdma
dialer-group 1
async default routing
async mode interactive
no peer default ip address
no fair-queue
no ppp lcp fast-start
!
router mobile
!
ip mobile secure home-agent 64.161.107.162 spi 100 key hex
12345678123456781234567812345678 algorithm md5 mode prefix-suffix
ip mobile router
  address 15.4.1.2 255.255.255.0
  home-agent 64.161.107.162
!
dialer-list 1 protocol ip permit
!
line con 0
  exec-timeout 0 0
  logging synchronous
  stopbits 1
!
line 1
  exec-timeout 0 0
  flush-at-activation
  script dialer airlink-cdma
  login
  modem InOut
  no exec
  transport input all
  autoselect during-login
  autoselect ppp
  stopbits 1
  speed 115200
  flowcontrol hardware
!
line aux 0
  exec-timeout 0 0
  speed 115200
line vty 0 4
  exec-timeout 0 0
  password cisco
  logging synchronous
  login

```

Example of a Mobile Access Router with Multiple Wireless Connections

```

ip dhcp excluded-address 10.10.10.1
!
ip dhcp pool testpool
  import all
  network 10.10.10.0 255.255.255.0
  default-router 10.10.10.1 255.255.255.0
  dns-server 204.117.214.10
!

```

```

ip cef
chat-script airlink-cdma2 "" "ATDT#19788" TIMEOUT 60 "CONNECT"
chat-script tmobile "" "AT" TIMEOUT 5 OK "ATEOV1" TIMEOUT 5 OK "ATS0=0" TIMEOUT 5 OK
"AT+CGATT=1" TIMEOUT 5 OK "AT+CGACT=1,1" TIMEOUT 5 OK "ATD*99***1#" TIMEOUT 10 CONNECT
chat-script anydata "" "AT&C1&D0" TIMEOUT 30 OK "ATDT#777" TIMEOUT 30 CONNECT
!
interface FastEthernet0/0
 ip address 10.10.10.1 255.255.255.0
!
interface Serial2/0
 physical-layer async
 no ip address
 encapsulation ppp
 dialer in-band
 dialer pool-member 1
 dialer-group 1
 no keepalive
!
interface Serial2/1
 physical-layer async
 no ip address
 encapsulation ppp
 shutdown
 dialer in-band
 dialer pool-member 2
 no keepalive
!
interface Dialer0
 ip address negotiated
 ip mobile router-service roam priority 130
 ip mobile router-service collocated registration retry 3
 ip mobile router-service collocated
 encapsulation ppp
 dialer pool 1
 dialer idle-timeout 0
 dialer string 1
 dialer persistent
 dialer-group 1
 ppp authentication pap callin optional
!
interface Dialer1
 ip address negotiated
 ip mobile router-service roam
 ip mobile router-service collocated registration retry 3
 ip mobile router-service collocated
 encapsulation ppp
 dialer pool 2
 dialer idle-timeout 0
 dialer string 2
 dialer persistent
 dialer-group 2
 ppp chap hostname 4082029572
 ppp chap password 0 vzw
!
ip mobile secure home-agent 64.161.107.162 spi 100 key ascii hello algorithm md5 mode
prefix-suffix
ip mobile router
 address 20.20.20.1 255.255.255.0
 collocated single-tunnel
 home-agent 64.161.107.162
 mobile-network FastEthernet0/0
 reverse-tunnel
 tunnel mode gre
!

```

```
line 5
  exec-timeout 0 5
  flush-at-activation
  script dialer airlink-cdma2
  modem InOut
  no exec
  transport input all
  stopbits 1
  speed 115200
  flowcontrol hardware
line 6
  exec-timeout 0 5
  flush-at-activation
  script dialer anydata
  modem InOut
  no exec
  transport input all
  stopbits 1
  speed 115200
  flowcontrol hardware
```

Example of a Home Agent Configuration

```
hostname HomeAgent
!
ip subnet-zero
!
no ip domain-lookup
!
ip audit notify log
ip audit po max-events 100
!
fax interface-type fax-mail
mta receive maximum-recipients 0
!
interface Loopback0
  ip address 10.10.100.1 255.255.255.0
!
interface FastEthernet0/0
  ip address 64.161.107.162 255.255.255.248
  duplex auto
  speed auto
!
ip classless
ip route 0.0.0.0 0.0.0.0 64.161.107.161
ip http server
ip pim bidir-enable
ip mobile home-agent
ip mobile virtual-network 15.4.0.0 255.255.0.0
ip mobile host 15.4.1.2 virtual-network 15.4.0.0 255.255.0.0
ip mobile secure host 15.4.1.2 spi 100 key hex 12345678123456781234567812345678
!
line con 0
  exec-timeout 0 0
  logging synchronous
line aux 0
line vty 0 4
  exec-timeout 0 0
  password cisco
  logging synchronous
  login
!
end
```

Initialization Strings

Recommended initialization strings for some common modems are provided in [Table 13-1](#), but be aware that Cisco does not warrant that they are suitable or current. When in doubt, refer to the modem vendor's documentation or technical support.

Table 13-1 Modem Chat Scripts

Modem	Network	Script
Airlink Raven	Sprint	chat-script airlink-cdma "" "ATDT#19788" TIMEOUT 60 "CONNECT"
Airlink Raven	Verizon	chat-script airlink-cdma "" "ATDT#19788" TIMEOUT 60 "CONNECT"
AnyDATA I-Port EMIII	Verizon	chat-script anydata "" "AT&C1&D0" TIMEOUT 30 OK "ATDT#777" TIMEOUT 30 CONNECT
Sony/Ericsson T68i Handset	AT&T	chat-script ericsson-gprs "" "AT" TIMEOUT 30 OK "ATE0Q0&C1&D2V1" TIMEOUT 60 OK "AT" TIMEOUT 30 OK "ATS0=0" TIMEOUT 30 OK "AT" TIMEOUT 30 OK "ATE0Q0&C1&D2V1" TIMEOUT 60 OK "AT" TIMEOUT 30 OK "ATDT*99***1#" TIMEOUT 30 CONNECT
Wavecom	T-Mobile or AT&T	chat-script tmobile "" "AT" TIMEOUT 5 OK "ATE0V1" TIMEOUT 5 OK "ATS0=0" TIMEOUT 5 OK "AT+CGATT=1" TIMEOUT 5 OK "AT+CGACT=1,1" TIMEOUT 5 OK "ATD*99***1#" TIMEOUT 10 CONNECT
Motorola i90c	Nextel	chat-script ModemTech "" "ATZ2" OK "AT&C1&D2" OK "ATDT" TIMEOUT 60 CONNECT