# CDMA2000-WiMAX Interworking

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With the advent of next generation mobile data networks, ubiquitous, high-speed, mobile Internet access has become a reality. However, the concurrent development of multiple mobile data technologies has led to the existence of overlapping, mutually incompatible mobile data networks. This work examines the 3rd generation CDMA2000 1xEV-DO and 4th generation WiMAX data networks and introduces methods for dual-antenna mobile stations to seamlessly interoperate between the two networks. In particular, we introduce protocol extensions that enable CDMA2000 account holders to authenticate and roam on WiMAX networks, and vice-versa. Notably, our extensions do not require changes to message flows, only to the contents of existing messages.

Network Architecture

CDMA2000 1xEV-DO and WiMAX both use IETF standards to provide core registration, authentication, and mobile routing services. Their use of open standards simplifies interworking and eliminates the need for network interworking functions such as those necessary to enable interworking between GSM and CDMA2000. Although their air interfaces and radio access networks differ vastly, thus requiring dual-mode mobile stations, their core networks are both IP-based, which allows for not only interworking but also the simultaneous development of integrated services, such as mobile video applications or IP telephony.
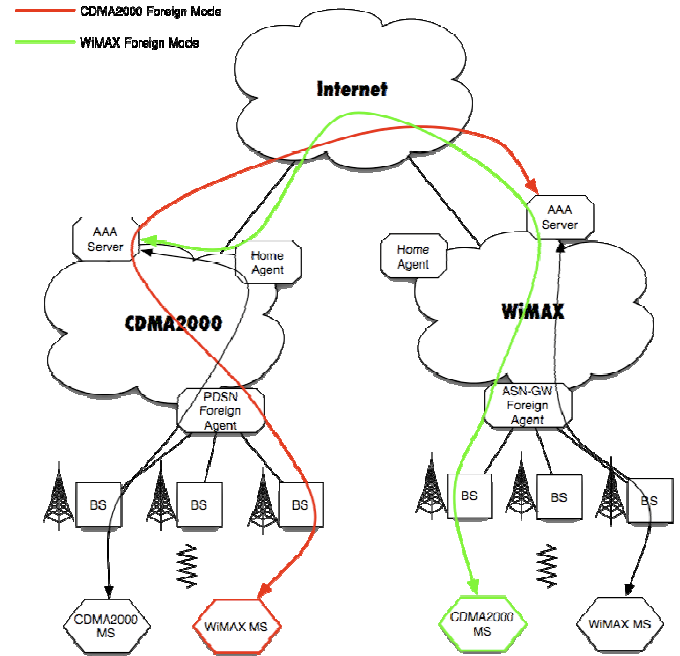
- CDMA2000 air interface uses CDMA, WiMAX air interface uses OFDMA

- Both core networks are based on AAA (Authentication, Authorization, Accounting) servers using RADIUS or Diameter

- Visiting AAA servers allow users to authenticate even when not on their home network

- Both core networks use Mobile IP to manage mobility

- CDMA2000 uses Mobile IP for authentication; Home Agent authenticates using RADIUS

- WiMAX uses EAP-TLS authentication; ASN-GW authenticates using RADIUS

CDMA200 Foreign Mode
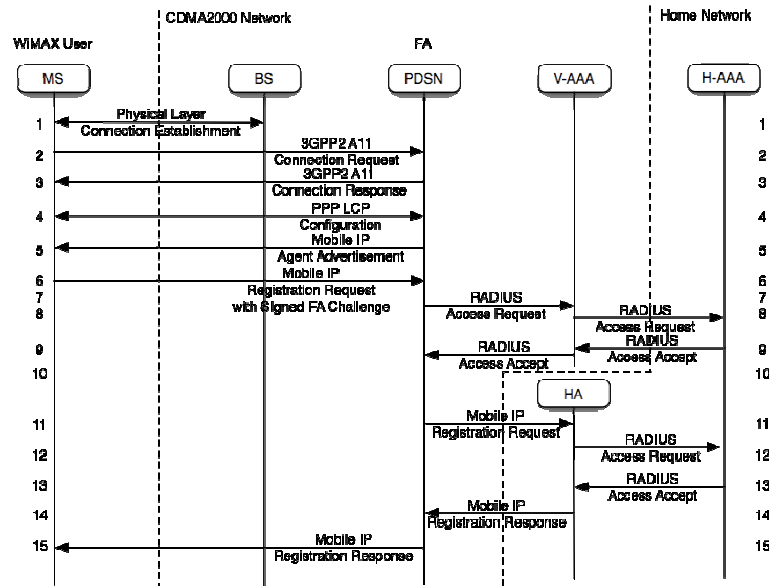
- WiMAX subscriber on a CDMA2000 network

- Mobile IP authentication between MS and PDSN

- Interworking achieved through new Mobile IP authentication extensions

- RADIUS authentication between PDSN and AAA servers

WiMAX Foreign Mode
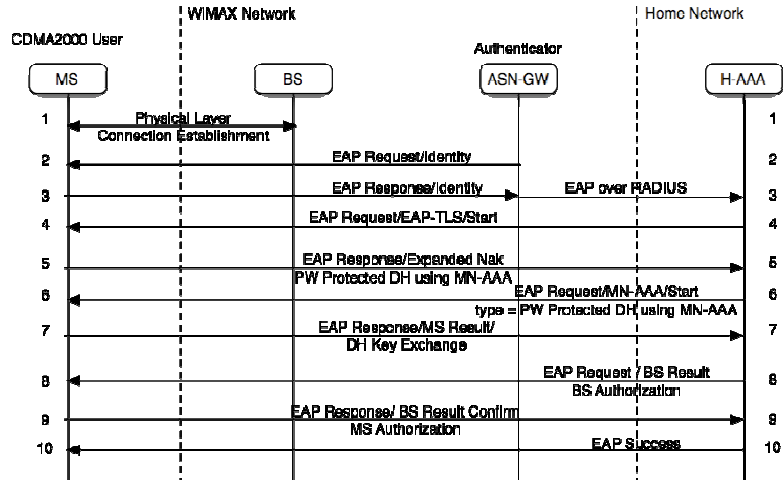
- Used when a CDMA2000 network subscriber roams on a WiMAX network

- Uses EAP authentication framework to authenticate MS to AN-GW

- Basic EAP type defined by CDMA2000-WiFi interworking standard

- EAP over RADIUS authentication used between ASN-GW and AAA server