CDMA 2000 1xEV-DO Overview

Version 01.01

The evolution to CDMA2000 1xEV-DO



Wireless Evolution

		CDMAone		CDMA2000/IS-2000	
Generation	**1G**	**2G**	**2G**	**2.5G**	**3G**
Technology	**AMPS**	**IS-95/J-Std008**	**IS-95B**	**IS-2000: 1xRTT**	**IS-2000: 3xRTT**
Signal Bandwidth, #Users	30 kHz. 1	1250 kHz. 20-35	1250 kHz. 25-40	1250 kHz. 50-80 voice and data	F: 3x 1250k R: 3687k 120-210 per 3 carriers
Data Capabilities	None, 2.4K by modem	14.4K	64K	153K 307K 230K	2.4 Mb/s
Features: Incremental Progress	First System, Capacity & Handoffs	First CDMA, Capacity, Quality	•Improved Access •Smarter Handoffs	•Enhanced Access •Channel Structure	Faster data rates on shared 3-carrier bundle

Spreading Rates and Radio Configurations

- Spreading Rate refers to the speed of the waveform which spreads the CDMA signal, determining its spectral width and its processing gain
  - Spreading Rate 1 is 1,228,800 chips per second, identical to current IS-95 operation. It makes signals about 1.25 MHz. wide, and can carry certain amounts of data per sector
    - This is called 1xRTT, 1x Radio Transmission Technology
  - Spreading Rate 3 is 3 times Spreading Rate 1, or 3,686,400 chips per second. It makes signals about 3.75 MHz. wide and can carry larger amounts of data per sector
    - This is called 3xRTT, 3x Radio Transmission Technology
- Radio Configuration refers to the coding arrangements and channel definitions used

IS-2000 Overview

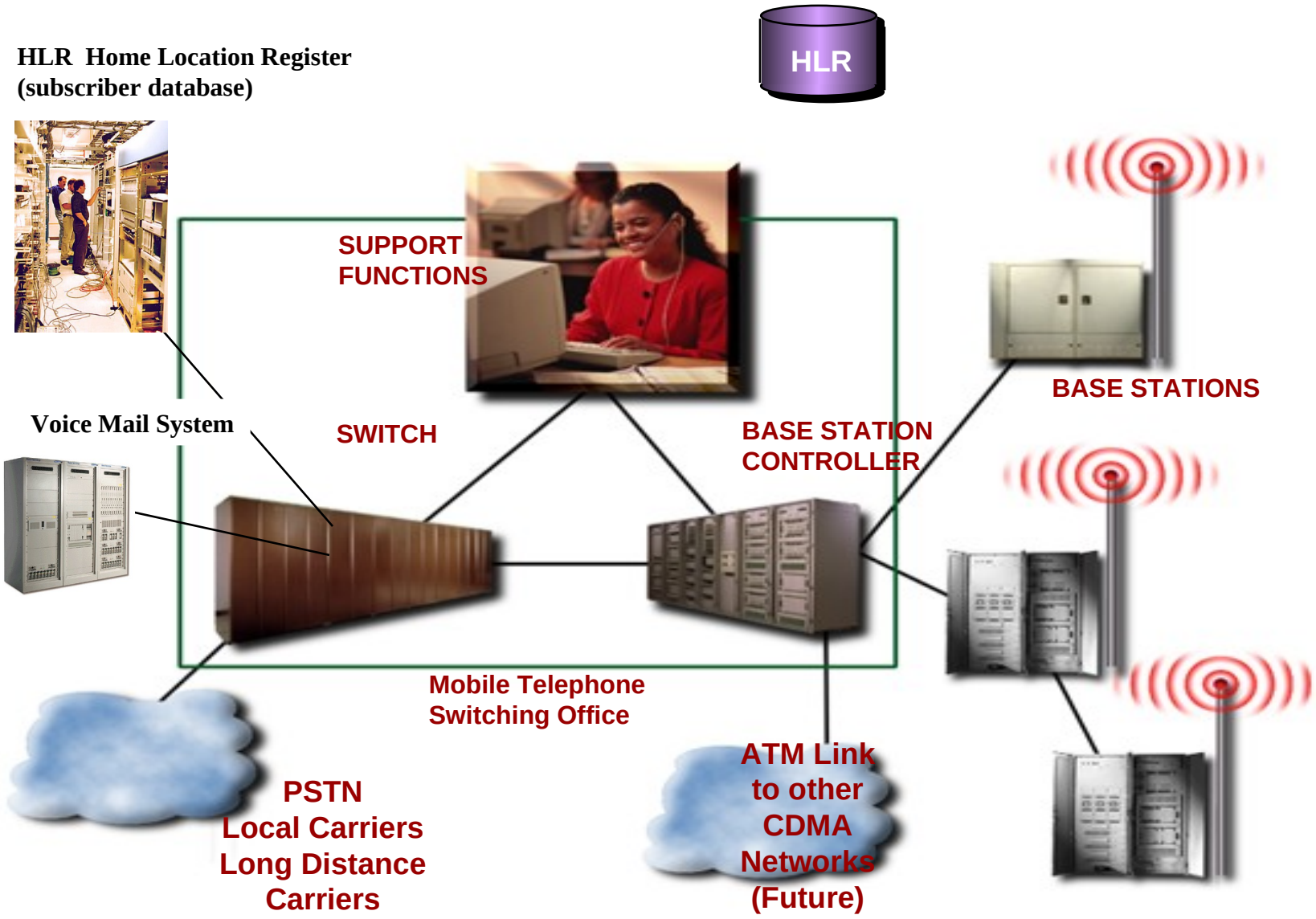
- Basic operation is compatible with existing IS-95B systems
  - New transmission modes offer faster data rates
    - Up to 153.6 kbps packet or 14.4 kbps circuit switch data
  - More effective Mobile signal
  - Reverse Link Pilot transmitted by mobile in advanced modes
    - Allows synchronous demodulation
- Improved convolutional encoding for more robust channels
- Faster power control on forward link
- Quick-paging channel improves slotted-mode paging

The path to CDMA2000 1xEV-DO

CDMA2000 1X in the beginning:

- CDMA2000 1xEV-DO is an evolution from conventional IS-2000 (CDMA2000 1X) networks.
- CDMA2000 1X offers both voice and data capabilities compared to conventional CDMA (IS-95) networks (voice only)
- CDMA2000 1X high speed packet data
  - Rates of up to 153.6 Kbps (144 Kbps user)

Structure of a Typical Wireless System



What is CDMA2000 1xEV-DO?

- CDMA2000 1xEV-DO (1xRTT evolution–data only) is a wireless packet data-only technology
  - Used for customer data applications where voice communication is not required
- high-speed packet data support of variable rates up to 2.45 Mbps on the forward link and up to 153.6 kbps on the reverse (upload) link
- CDMA2000 1xEV-DO uses time-division multiplexing (TDM) in the forward direction, meaning there are no soft handoffs in the forward direction and only one terminal receives data from each sector at a given time