

1xEV-DO Training

1xEV-DO or 1x Evolution for Data Optimized (Rev 0, Rev A, Rev B and Rev C; Ultra Mobile Broadband (UMB)), a data-optimized version of CDMA2000 called 1xEV-DO, provides a flexible, integrated solution that maximizes capacity and throughput for both voice and data. This course presents a clear explanation of 1x-EV-DO including: its advantages, standards, architecture, protocols, operations, technical capabilities, security and implementation.

Who Should Attend

Anyone with IS-95/cdmaOne experience and knowledge in need of in-depth insight of the 1xEV-DO radio interface and the packet radio system including: system operators, technicians, engineers, telecommunication managers responsible for analysis, designing, manufacturing, deploying, and optimizing performance of CDMAone and CDMA2000 wireless systems . RF engineers, network planners and advanced users who wish to gain the fundamental knowledge of the issues involved in the migration process from an IS-95 network to a CDMA2000 1xEV-DO, will find this course an essential. This course is beneficial for anyone involved in product design, system design, test, engineering, and network operations.

Objectives

After completing this course, students will be able to:

- Explore Spread spectrum signal generation and spreading requirements
- Understand CDMA2000-1x-EV-DO (Rev 0, Rev A, Rev B and Rev C)
- 1xEV-DO (Rev C), UMTS-LTE (HSOPA) and Mobile WiMAX
- Discuss 1xEV-DO Call processing
- Understand Codes and Modulation Schemes used in 1xEV-DO
- Understand Physical Layer Packet Formats
- Understand Forward Link Structure
- Understand Reverse Link Structure
- Discuss Data Rates and Modulation Parameters
- Discuss fundamentals of TCP/IP
- AAA-RADIUS, Routers, Bridges, NAT, Security and IPsec
- Review CDMA2000 packet network architecture
- Discuss call processing in 1xEV-DO
- Review 1xEV-DO end-to-end scenarios
- Explore project planning process of 1xEV-DO Networks
- Review successful 1xEV-DO Deployments
- Step through a practical process for managing 1xEV-DO networks

- Explore the current and future market trends
- Overview of features of both Rev 0 and Rev A and differences between the two releases

Outline

Introduction and Benefits of 1xEV-DO

- 1xEV-DO
- Rev. 0 and Rev. A Features
- Rev B and C Features
- Applications and Services
- Coverage and Service Availability
- System operation and maintenance
- Spectral Efficiency
- Service Quality
- Transition Scenarios

CDMA2000 (1x) Radio Networks

- CDMA2000 (1x) Packet Core Network
- PDSN, AAA, HA, FA
- End-to-End data session scenarios
- Simple IP and Mobile IP
- Mobility and Roaming

1xEV-DO Key Concepts

- Link Adaptation philosophies
- Fast Cell Selection techniques
- Hybrid ARQ operation
- Support for QoS
- New 1xEV-DO Channels
- 1xEV-DO session establishment

1xEV-DO System Description

- 1xEV-DO networks
- 1xEV-DO design
- 1xEV-DO protocol layering
- 1xEV-DO Design considerations
- System Performance Projections
- Link Budgets Analysis
- System Capacity

1xEV-DO network Description

- Network Architecture
- 1xEV-DO six protocol layers
- 1xEV-DO Airlink Design
- 1xEV-DO Reverse Link
- 1xEV-DO Forward Link
- 1xEV-DO Signaling

1xEV-DO Network Architecture Evolution

- Evolving network architecture
- Interfaces and protocols
- Evolution path of 1xEV-DO
- OFDMA and Multiple Antenna Essentials
- OFDM vs. CDMA
- Multiple antenna techniques
- 1xEV-DO (Rev 0, A, B and C) Air Interface
- Support for MIMO

1xEV-DO protocols

- Physical Layer
- MAC Layer
- Security Layer
- Connection Layer
- Session Layer
- Stream Layer
- Application Layer
- 1xEV-DO Call Processing
- Session and connection layer protocols
- 1xEV-DO identifiers
- 1xEV-DO Packet Data Networks
- New IOS interfaces
- AN-AAA
- R-P interface
- Other components

Physical Layer

- Bands of operation
- Forward and Reverse Links

- Forward link channels structure
- Reverse link channel structure
- Walsh codes
- The Scheduler
- Power and Data Rate Control
- Encoding
- Modulation
- Multiplexing

MAC Layer

- Control Channel MAC Protocol
- Forward Traffic Channel MAC Protocol
- Reverse Channel MAC Protocol
- Access Channel MAC Protocol

Security Layer

- Security Protocol
- Authentication Protocol
- Key Exchange Protocol
- Encryption Protocol

Connection Layer

- Air Link Management Protocol
- Initialization State Protocol
- Idle State Protocol
- Connected State Protocol
- Packet Consolidation Protocol
- Route Update Protocol
- Overhead Messages Protocol

Session Layer

- SMP (Session Management Protocol)
- AMP (Address Management Protocol)
- SCP (Session Configuration Protocol)

Application Layer

- SNP (Signaling Network Protocol)
- SLP (Signaling Link Protocol)
- RLP (Radio Link Protocol)

- LUP (Location Update Protocol)

1xEV-DO Operations Scenarios

- Mobile IP and 1xEV-DO Networks
- Detailed operation of Mobile IP
- HA and FA
- 1xEV-DO & CDMA2000 Interworking
- Transition to 1xEV-DO
- End-to-End Call Scenarios