# Understanding TeleCom Networks Today I





# **Course Description**

The make-up and structure of telecommunications networks has changed drastically. These changes affect the equipment you purchase, the services you buy, the providers you can choose, and the media you use for transport. One call will no longer take care of all your needs. Without a full understanding of the changes that occurred and how they have affected voice and telephony services, products, and technology, you and your network will become obsolete.

This course will provide you with the basics of voice call processing, features, and hardware/software solutions. If your network is converging, you need to comprehend voice technologies to complement your data knowledge. If you are trying to sell or market services, this course will help you with the buzzwords, the technology, and the applications.

# **Students Will Learn**

- Voice networks and telephony
- Digital networking
- Wireless, cellular, and satellite communications
- Service providers and public network architecture
- PBX, Centrex, ACD, and key systems
- Call processing
- CTI equipment and services
- Signaling, including SS7

# **Target Audience**

This course is appropriate for data professionals needing voice training, consultants, executives, IT managers, marketing/sales, and network analysts, designers, engineers, and technicians.

# **Course Outline**

## 1. Overview of Telecommunications

Understand the major events in U.S. telecommunications, including the AT&T infrastructure before and after divestiture, and the Telecom Act. Short history of telecommunications Types of connections Differentiating types of calling services Divestiture of AT&T and equal access Introduction to the Telecom Act of 1996 U.S. regulatory bodies Standards

## 2. Call Processing

Explore telephone components, central office switches, the PSTN, and signaling Components of the telephone Local loop connection Central office switch Public Switched Telephone Network (PSTN) Signaling over POTS

#### 3. Technology Fundamentals

Examine communications methods and devices, how voice is transmitted, and the principles of multiplexing Communications methods Modulation/demodulation Communications devices Telephone Codec Modem CSU/DSU Electromagnetic spectrum Types of media Copper Shielded/unshielded twisted pair Coaxial cable Fiber Optic Multimode Single mode Wireless communications System classes Directional systems Omnidirectional systems Transmission impairments Microwave communications Intro to satellites Geostationary Low Earth Orbit (LEO) Multiplexing Frequency Division Multiplexing (FDM) Time Division Multiplexing (TDM) Wave Division Multiplexing (WDM)

#### 4. Digital Access and Transport Systems

Learn how voice signals are converted to digital, digital access and cross-connect systems, and high-speed services Converting a voice signal to digital North American Digital Hierarchy (NADH) DS0 DS1 (T1) DS2 DS3 European hierarchy E1 E2 E3 Digital Access and Cross-connect System (DACS) Synchronous Optical Network (SONET) SONET/SDH hierarchy rates Concatenation - super rate payloads Virtual tributaries SONET topology Integrated Services Digital Network (ISDN) ISDN fundamentals Interface types Basic Rate Interface (BRI) Primary Rate Interface (PRI) Categories of equipment Applications for ISDN xDSL Installation challenges Asymmetrical bandwidth Asymmetric DSL (ADSL) for voice and data g.dmt G.lite High-Speed DSL (HDSL) symmetrical service

## 5. Customer Premises Equipment and Services

Comprehend PBX, Key systems, and ACDs. Understand Centrex and CTI Customer telephone system types Private Branch exchanges (PBXs) Key systems Hybrid system Automatic Call Distributors (ACDs) Computer Telephony Integration (CTI) Interactive Voice Response (IVR) Cabling, connectors and equipment (business environment) Centrex service Analog Digital (ISDN)

## 6. Wireless Telecommunications

Examine the evolution of wireless technology, cellular networks, and air interfaces. Understand AMPS, GSM, and PCS Components of a cellular network Mobile Telephone Switching Office (MTSO) Mobile subscriber units Cell sites Base station transceivers Cellular antennas Evolution of mobile telecommunications Cellular telephony Cellular concept - reusing frequencies Cell clusters Handoff between adjacent cells Air interfaces Frequency Division Multiple Access (FDMA) Time Division Multiple Access (TDMA) Code Division Multiple Access (CDMA) Advanced Mobile Phone Service (AMPS) Second generation wireless technology Digital cellular Global System for Mobile Communications (GSM) Personal Communications Service (PCS) Other wireless technologies Cordless telephony Fixed wireless access Wireless local loop implementation Wireless PBX implementation

## 7. The Future of Voice Telecommunications

Examine the technologies driving voice and data convergence. Explore how voice and data is being carried over cable TV networks and how LECs are deploying networks. Migration from circuit to packet switching Convergence of voice and data for enterprise networks Voice over cable TV networks Digitizing voice over DSL

## **Equipment Requirements**

## (This apply's to our hands-on courses only)

BTS always provides equipment to have a very successful Hands-On course. BTS also encourages all attendees to bring their own equipment to the course. This will provide attendees the opportunity to incorporate their own gear into the labs and gain valuable training using their specific equipment.

# **Course Length**

2 Days