

# Fundamentals of Telecommunications

This 2-day workshop provides an overview of the rapidly changing telecommunications technologies and the customer needs they satisfy. Beginning with an update of the telecommunications industry, this seminar defines the services provided by local exchange carriers and long distance companies, followed by the customer voice systems (key, PBX and IP PBX, CENTREX, ACD, CTI, voice response, etc.) and data applications (modems, multiplexers, LAN/WAN, routers, switches, etc.) and how customers employ these systems to solve business problems. An overview of contemporary telecommunications circuits (analog, digital, dedicated, switched, T1, T3, SONET, etc.) helps participants understand customer connectivity alternatives. The move to IP based networks and services like the Internet, ISPs and MPLS will be explored with their impact on the organization.

Technologies like ISDN, VoIP, DSL, cable modems, communications servers, speech recognition, frame relay, fiber optics and ATM are presented along with other emerging trends affecting large and small users. The wireless section explores WLANS, evolving 3G and 4G systems and features, highlighting the growing wireless data and Wireless Web solutions. Voice over IP (VoIP) and IP Telephony technologies and operation will be discussed. Participants will gain new understanding of the telecommunications industry, its products/services and where they fit in customers' enterprise networks.

## Who Should Attend

This workshop is designed as a basic training boot camp for those needing a solid grasp of the structure, operations and migration of the dynamic telecommunications field. Team members and managers in sales, marketing, operations, finance, R & D, legal/regulatory, customer service, IT and systems administration have all benefited.

## Workshop Objectives:

- ▶ Understand the fast-changing telecommunications industry of the mid-2000's.
- ▶ Clarify the differences between ILECs and CLECs.
- ▶ Understand telephone company and long distance company services and architectures.
- ▶ Demystify hundreds of Telecommunications acronyms and terms.
- ▶ Describe dial-up and dedicated circuit technology and applications.
- ▶ Discuss analog and digital transmissions.
- ▶ Differentiate among transmission media (copper, coax, satellite, microwave, fiber optics).
- ▶ Explore cellular services, including 3G and 4G solutions.
- ▶ See how the SS7 network optimizes carrier architectures.
- ▶ Understand business phone systems (key, PBX and IP PBX, ACD, voice response, etc.).
- ▶ Understand digital transmissions (DS1/E1, DS3/E3, SONET, ISDN).
- ▶ Define data communications applications and protocols.
- ▶ Understand data communications hardware (modems, multiplexing, emerging technologies).
- ▶ Understand the basics of legacy and contemporary LANs - 100 Mbps and up.
- ▶ Discuss LAN and WAN hardware and applications.
- ▶ Explore emerging WAN solutions (frame relay, ATM, etc.).
- ▶ Explore the Internet's components and operations.
- ▶ See how TCP/IP and routers are the foundation of IP networks.
- ▶ Find out how voice (VoIP) goes over IP networks - LAN, WAN and the Internet.
- ▶ Decide if the new server-based phone systems are right for your organization.
- ▶ Understand the myriad of Internet access alternatives — xDSL, ISDN, cable modems, wireless and POTS.

# Advanced Telecommunications

This 2-day workshop delivers an intermediate-to-advanced overview of the latest telecommunications networks, systems, applications and solutions in the competitive telecommunications marketplace.

Telephony and Internet carriers, and hardware and software providers, are deploying more advanced technologies, speed, capacity, and convergence. Even seasoned pros are challenged to stay current on fiber optic networks, gigabit and wireless LANs, DSL, broadband, PCS, 3rd and 4th generation wireless data, VoIP, CTI, CRM, WWW-enabled call centers, and dozens of other systems and applications. The emergence of IP based networks and services with their benefits and limitations will be discussed. Further, communications convergence, multimedia applications, and E-commerce are of intense interest to telecommunications and IT professionals, all of which are covered in this workshop.

## Who Should Attend

Executives, managers, and team members needing to take the 'next step' in their technical professional development and needing an update on technical directions for the mid-2000s will benefit from this seminar and its participants' handbook. Attendees often include participants from top management, finance, sales, marketing, project management, network engineers, customer service, operations, IT, and other departments and functions.

## Prerequisites

This program is not a bits and bytes dump developed only for engineers. If you have completed our Fundamentals of Telecommunications or equivalent, and have at least two years experience in the industry, this workshop is for you.

## Workshop Objectives:

- ▶ Examine how the PSTN is morphing into an IP-enabled, feature centric platform.
- ▶ Demystify carrying voice phone calls over LANs, WANs and the Internet — learn how VoIP and IP Telephony work.
- ▶ Who are the likely survivors and losers in the changing Telecommunications marketplace?
- ▶ Where do service providers, ISPs, cable companies and fiber to the premises fit into the communications environment?
- ▶ Compare the emerging alternatives in high-speed access and transport?
- ▶ Discover the worlds of Unified Messaging and Unified Communications.
- ▶ Explore how LANs and WANs are evolving into high-speed converged networks.
- ▶ See how PBXs are evolving into server-based IP platforms for today and tomorrow.
- ▶ Investigate the WWW mandate for business — E-commerce — technology, applications, trends and issues.
- ▶ Drill down on convergence — explore voice and data applications on the same networks/systems.
- ▶ Examine a world without wires — new directions in wireless technology.
- ▶ Understand your vendors and techs — be ready to ask smarter questions.

# Fundamentals of Wireless Communications

It has been a long time coming, but the wireless revolution has finally caught hold in the industry. Worldwide wireless communications is exploding, The analysts may be too conservative in their estimates. PCs will be surpassed by the portable wireless devices such as Internet enabled handsets like the iPhone and more.

With development efforts underway in mobile communications spanning the use of GSM, GPRS, 3G, 4G, EDGE, CDMA2000, WiMax and Blackberry, one can only imagine the interoperability issues yet to surface. In the area of voice communications the operational impacts are exponential. However in a data communications exposure, the issues will be paramount. How then do you prepare for the onslaught of wireless devices and applications on the horizon?

Join us as we explore the many ways of handling voice and data over wireless technologies. This 2-day workshop will create an awareness of the options available to you. We will look at the variations of FDMA, TDMA, CDMA, 3rd and 4th generation of wireless (3G, 4G). Where 802.11 WLANs fit and their interoperability with cellular services will be explored. We will discuss the emerging and declining wireless technologies. We will also look at the interoperability of the various concepts that will handle a global networking perspective.

## Who Should Attend

This workshop is especially designed for telecommunication managers, wireless providers, wireless Internet service providers, wireless and WLAN manufacturers and engineers, sales and marketing personnel from wireless manufacturers and providers, and financial investors needing information regarding the technologies.

### Workshop Objectives:

- ▶ Gain an understanding of the present/future wireless systems currently on the market and those emerging.
- ▶ Orchestrate the carrying out of a pilot program, and gain practical application and "How to..." information before diving into this area.
- ▶ Develop a realistic approach to standardize the use of wireless communications within your organization for both cellular services and WLAN.
- ▶ Explore the many pricing plans offered.
- ▶ Integrate your network's present cable-based system with a WLAN system.
- ▶ Discuss the different standards/advances in the planned systems.
- ▶ Coordinate the efforts of users/vendors/carriers and other service groups in the wireless environment to your benefit.
- ▶ Learn about privacy, security and performance issues.
- ▶ Develop plans for Fixed Mobile Convergence
- ▶ Understand and be prepared to address the strengths and limitations of all these services.

# Voice over IP (VoIP) Concepts, Technologies, and Solutions

The telecommunications industry is evolving in significant ways. Voice, video and data are converging on the IP network. As new technology is constantly introduced and the demand for converged communications infrastructures soars, understanding the key technical concepts driving this modern revolution is essential to success in today's business environment.

This is a highly interactive 2-day workshop covering all the major topics and issues involved in planning, deploying and managing a Voice over IP (VoIP) solution. You will be exposed to the latest packetized voice, TCP/IP, voice transport, and industry best-practices including standardized session protocols (SIP and H.323), converged circuit/IP network architectures, softswitch/IP PBXs, IP phones, gateways, VoIP management, and implementations in a multidimensional learning environment involving lectures and examples. The workshop will focus on applying the theory learned during the first part of the sessions with the practices of network and voice quality management, monitoring, and control of your organization's voice and packet environments. The examples will be oriented towards real-life situations in which the participants can incorporate their own experiences and get answers to questions concerning current problems and issues. During the workshop, the concepts of understanding the "what" and "how" of designing, developing, and installing IP based voice systems will be integrated with the "why" and "wherefore" of sound communication planning and management of internal telephony infrastructures. Issues of preserving existing investments, staged implementations and solutions will be prominent throughout the session discussions to ensure the participant's grasp of making their IP based telephony environments practical, efficient, and cost-effective.

## Who Should Attend

Those involved in an organization's information and telephony infrastructure efforts: informational services personnel, telephony administrators, technical support personnel, wireless engineers, data network support personnel and their associated managers and supervisors. In addition, technical and management personnel from organizations that have deployed VoIP platforms, and need in-depth information on how to achieve improved return on investments from packetized voice services will also benefit from attendance.

## Workshop Objectives:

- ▶ Understand what VoIP and IP Telephony (IPT) are and how they can positively impact an organization.
- ▶ Understand the impact of VoIP on an organization's local and remote operations.
- ▶ Discover the basics of PSTN signaling (SS7, D-channel, DTMF)
- ▶ Discuss TCP/IP technologies including routers and their utilization throughout a data network.
- ▶ Explore both the H.323 and SIP architectures for supporting VoIP.
- ▶ Discuss RTP and RTCP protocols and their roles in VoIP/IPT implementations.
- ▶ Discover the use of related protocols such as MEGACO/H.248.
- ▶ Describe the capabilities of VoIP/IPT server hardware and call management software.
- ▶ Discuss the various vendor VoIP offerings and solutions.
- ▶ Describe codecs standards (G.711, G.729, G.722) used in VoIP and content streaming standards.
- ▶ Learn the impact of QoS (quality of service) issues on voice quality in converged networks.
- ▶ Discuss FoIP (Fax over IP) and its applications.
- ▶ Review network implementation issues and testing.
- ▶ Discuss VoIP management and support challenges.
- ▶ Discuss telecommunications advances and industry trends.