Voice over Internet Protocol (VoIP)
EBS-243

Just like the oven and the refrigerator, computers are becoming a staple in a home these days. Almost all new construction is now wired with Internet connections. And many of these same homes are using their computers to control the entire house -- from the lights to the water sprinkler system to the air conditioning. And recently many have begun to use their computers for verbal communication. Voice over Internet Protocol (VoIP) has become popular with many household -- users are able to use the computer as they would their old phone lines. As demand for VoIP increases, so does the need for skilled VoIP technicians. Heathkit Educational Systems (HES) has created a course that introduces the fundamentals of VoIP, that will successfully lead students down a new career path.

TelCom Technology

Quick View
- Provides an introduction to Voice over Internet Protocol (VoIP)
- Flexible and Modular Curriculum

System Components
- Textbook
- Workbook
- Parts Pack
- Instructor's Guide
- Instructor Support Pack

Optional Support Material
Instructor Support Module (ISM)
- Material Required for Lecture
- Material Required for Each Lab Station
- Material Covered (Required Support Material and Associated Reading Assignment)
- Course Objectives
- PowerPoint Presentations (.ppt and .html versions)
- Lab Session

Classroom Hours
- 25 hours

Prerequisites
Recommended
- Knowledge of Internet Fundamentals and Computer Networking

HEATHKIT EDUCATIONAL SYSTEMS

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Voice over Internet Protocol (VoIP)

Course Objectives

After you complete this course, you will be able to:

- Install and configure a soft phone in a desktop PC
- Install and configure a VoIP router
- Implement a VoIP system using standard analog phones and analog telephone adapters (ATAs)
- Implement a VoIP system using IP Phones and a router or PC connection to Internet
- Implement a small-office, home office (SOHO) VoIP system
- Demonstrate call forwarding, conferencing, redial, and call splitting using VoIP
- Configure a workstation as a softphone client
- Implement a PC-to-PC VoIP system using soft phones
- Demonstrate a computer-to-computer VoIP
- Implement a VoIP Service Provider
- Demonstrate an IP telephone-to-PSTN telephone call
- Identify several different method of protecting the VoIP Implementation
- Identify and correct common VoIP hardware problems
- Identify several different methods of protecting the VoIP Implementation
- Compare and contrast the following security precautions - MAC address filtering, port filtering and encryption

Course Objectives (continued)

- Explain the changes that must be made to an organization firewall in order to successfully implement VoIP
- List the basic characteristics of each of the following VoIP switching standards - H.323, SIP MGCP and Megaco/H.248
- Identify the most common VoIP media transfer protocols
- Understand the purpose, functions, features and architectures of Media gateway Control Protocol (MGCP) and Magco/H.323
- Explain the purpose of Real Time Protocol (RTP) and Real Time Control Protocol (RTCP) as they apply to VoIP
- List the major protocols used in typical VoIP session and place each in the proper level of OSI Reference Model
- Identify each of the following organizations related to the VoIP Industry and explain their roles - ITU and IETF
- Use a network protocol analyzer to capture and display VoIP packets
- Identify VoIP packets by their purpose, function, and format
- Analyze a complete VoIP session using a network protocol analyzer
- Explain the difference between circuit switching and packet switching
- Draw a basic block diagram of a typical PSTN voice call and a VoIP
- Explain the purpose of Real Time Protocol (RTP) and Real Time

Course Objectives (continued

- Explain the advantages and disadvantages of VoIP versus PSTN
- Understand the vocabulary, history and future promise of VoIP
- Understand the equipment used for implementing residential and Enterprise level VoIP including analog telephone adapters (ATA), IP phones, media gateways, media gateway controllers, IP-based PBXs and gatekeepers
- Outline four different approaches to implementing VoIP
- Define *codec* and explain its function
- Outline some of the Quality of Service (QoS) issues related of VoIP
- Explain the role of the VoIP Service Provider

Hands-On Experiments

1. Preparing for VoIP
2. The Soft-phone
3. Placing a VoIP Call
4. The Network Protocol Analyzer
5. Capturing and Analyzing a VoIP Session
6. The SIP-Based VoIP Soft-phone
7. Investigating VoIP Characteristics
8. VoIp Calling features - Part 1
9. VoIP Calling features - Part 2
10. The VoIP Analog Telephone Adapter
11. Configuring VoIP
12. Capturing and Analyzing a SIP Session

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