

Introduction

Hospitals are moving quickly into a digital and filmless world of information. Innovations in technology that are providing better and faster image diagnosis are rapidly showing up in all areas of diagnostic imaging. As a service professional in radiology or biomedical engineering, you need to become familiar with the trends in computer/information networking, and DICOM standards.

This course is designed to provide maintenance providers with an introduction to the hospital network environment as well as the fundamentals of implementation of the DICOM Standard

Objectives

- Understand general network architecture
- Understand advanced network architecture
- Understand primary functions of TCP/IP and why it works in a hospital environment
- Recognize the key components of a DICOM conformance statement
- Recognize and understand the terminology used in DICOM, PACS, and computer technology
- Understand the DICOM standard and its importance to PACS, RIS, and HIS
- Demonstrate and implement an understanding of the DICOM standard

- Demonstrate an understanding of network terms and methodologies
- Demonstrate the ability to set up a local area network with communication to existing medical modalities
- Demonstrate the ability to set up a local area network with communication from existing medical modalities to a service laptop

Course Outline

Day 1

- Introduction to networking
- Network Topologies
- Transmission Technologies
 - Circuit/packet switching
- OSI Model
- Network Hardware
 - Hub
 - Switch (managed vs. unmanaged)
 - Router
 - NIC
 - Cabling
 - 10/100/1,000/10,000BaseT
- Client/Server architecture
- TCP/IP
 - IP Address
 - Subnet Mask
 - Default Gateway
 - DHCP
 - DNS
 - WINS
 - TCP Ports
 - IP Classes
 - Custom Subnetting and VLAN's
- Lab Activities

- Configure a basic LAN using static IP addresses
- Configure client/server network
- Configure port forwarding behind NAT router utilizing client/server setup

Day 2

- Introduction to DICOM
- History of DICOM
 - ACR/NEMA 1.0 & 2.0
 - DICOM 3.0
 - DICOM (versionless)
- DICOM
 - DICOM Objects
 - DICOM Message Structure
 - Network Layers & Communication
 - DICOM Storage Service
 - DICOM Print
 - DICOM Query/Retrieve
 - Worklist
 - Media
- Lab Activities
 - Configure service laptop to send/receive DICOM communications

Day 3

- DICOM Conformance Statements
- DICOM Issues
- Manufacturer Issues
- Regulatory Issues
- Technical Issues
- Overall Review
- Final Exam
- Lab Activities
 - Analyze DICOM Conformance Statements for your existing systems