

CIT 282

Advanced Routing and Switching

Course Description

This course is designed to provide students with the skills necessary to understand and apply advanced networking concepts. This course covers local area network (LAN) switching, virtual local area networks (VLANs), advanced network design concepts, advanced router configuration, and advanced network management projects. This is the third course in the Cisco Networking Academy Curriculum. Prerequisites: CIT 281; or consent of instructor.

Course Competencies

Upon successful completion of this course, the student can:

1. Demonstrate an understanding of Local Area Network (LAN) Switching
2. Demonstrate an understanding of Virtual Local Area Networks
3. Demonstrate an understanding of Local Area Network Design
4. Demonstrate an understanding of Interior Gateway Routing Protocol (IGRP)
5. Demonstrate an understanding of Access Control Lists
6. Demonstrate an understanding of Novell IPX

Course Outline

- I. Local Area Network (LAN) Switching
 - A. The Ethernet/802.3 interface
 - B. Half-duplex Ethernet design (Standard Ethernet)
 - C. Congestion and bandwidth
 - D. Propagation delay
 - E. Ethernet transmission times
 - F. Extending shared media LANs using repeaters
 - G. Improving LAN performance
 - H. Segmentation with bridges
 - I. Segmentation with routers
 - J. Segmentation with LAN switches
 - K. LAN switch latency
 - L. Full-duplex Ethernet overview
 - M. Full-duplex Ethernet design
 - N. Benefits of switching
 - O. Symmetric switching
 - P. Asymmetric switching
 - Q. Memory buffering
 - R. Two switching methods
 - S. Introducing spanning-tree protocol
 - T. Understanding STP states
- II. Virtual Local Area Network (VLAN)
 - A. Virtual LANs

1. Introduction to VLANs
 2. Frame filtering
 3. IEEE 802 VLAN standardization
 4. Adding, moving or changing user locations
 5. VLANs establish broadcast domains
 6. Tightening network security
 7. Remove the physical boundaries
- B. Switches and Hubs
 - C. VLAN implementation
- III. Local Area Network Design
- A. LAN design
 1. LAN design goals
 2. Design methodology
 3. VLAN operation
 - B. Gathering and analyzing network requirements
 - C. Layer 1 media and topology
 - D. Layer 2 LAN switching
 - E. Layer 3 routing
 - F. File servers and traffic patterns
 - G. Documenting your network
- IV. Interior Gateway Routing Protocol
- A. Network layer basics
 - B. Routing protocols
 - C. Configuring IGRP
- V. Novell IPX
- A. IPX routing overview
 - B. Configuring IPX routing
 - C. Verifying and monitoring IPX routing