COURSE OUTLINE

CSCO-284

Accessing the WAN
3 Credits

HOWARD COMMUNITY COLLEGE

Description

This course explains the principles of traffic control and access control lists (ACLs) and provides an overview of the services and protocols at the data link layer for wide-area access. Students learn about user access technologies and devices and discover how to implement and configure Point-to-Point Protocol (PPP), Point-to-Point Protocol over Ethernet (PPPoE), DSL, and Frame Relay. WAN security concepts, tunneling, and VPN basics are introduced. The course concludes with a discussion of the special network services required by converged applications and an introduction to quality of service (QoS). Prerequisites: CSCO-282 and CSCO-283. (2 hours lecture, 3 hours lab)

Overall Course Objectives

Upon completion of this course, the student will be able to:

1. Describe the impact of applications (Voice Over IP and Video Over IP) on a network.
2. Identify and correct common network problems at layers 1, 2, 3, and 7 using a layered model approach.
3. Interpret network diagrams.
4. Describe the components required for network and Internet communications.
5. Implement basic switch security (port security, trunk access, management vlan other than vlan1, etc.).
6. Explain the operation and benefits of using DHCP and DNS.
7. Configure, verify, and troubleshoot DHCP and DNS operation on a router. (CLI/SDM)
8. Describe today's increasing network security threats and explain the need to implement a comprehensive security policy to mitigate the threats.
9. Explain general methods to mitigate common security threats to network devices, hosts, and applications.
10. Describe the functions of common security appliances and applications.
11. Describe security recommended practices including initial steps to secure network devices.
12. Describe the purpose and types of ACLs.
13. Configure and apply ACLs based on network filtering requirements. (CLI/SDM)
14. Configure and apply ACLs to limit telnet and SSH access to the router. (SDM/CLI)
15. Verify and monitor ACLs in a network environment.
16. Troubleshoot ACL issues.
17. Explain the basic operation of NAT.
18. Configure NAT for given network requirements. (CLI/SDM)
19. Troubleshoot NAT issues.
20. Describe different methods for connecting to a WAN.
21. Configure and verify a basic WAN serial connection.
22. Configure and verify a PPP connection between Cisco routers.
23. Configure and verify Frame Relay on Cisco routers.
24. Troubleshoot WAN implementation issues.
25. Describe VPN technology (importance, benefits, role, impact, components).

Major Topics

I. Introduction to Wide Area Networks (WANs)
   - A. The Evolving Enterprise
   - B. The Evolving Network Model
   - C. WAN Technology Concepts
   - D. WAN Connection Options

II. Point-to-Point Protocol (PPP)
   - A. Introduction to Serial Communications
   - B. PPP Concepts
   - C. PPP Configuration
   - D. PPP Troubleshooting

III. Frame Relay
   - A. Basic Frame Relay Concepts
   - B. Configuring Frame Relay
   - C. Advanced Frame Relay Concepts
   - D. Configuring Advanced Frame Relay

IV. Network Security
   - A. Introduction to Network Security
   - B. Securing Cisco Routers
   - C. Securing Router Network Services
   - D. Using Cisco SDM
   - E. Secure Router Management

V. Access Control Lists (ACLs)
   - A. Using ACLs to Secure Networks
   - B. Configuring Standard ACLs
   - C. Configuring Extended ACLs
   - D. Configuring Complex ACLs

VI. Teleworker Services
   - A. Business Requirements for Teleworker Services
   - B. Broadband Services
   - C. Virtual Private Network (VPN) Technology

VII. IP Addressing Services
   - A. Dynamic Host Control Protocol (DHCP)
   - B. Scaling Networks with Network Address Translation (NAT)
   - C. Internet Protocol version 6 (IPv6)

VIII. Network Troubleshooting
   - A. Establishing the Network Performance Baseline
   - B. Troubleshooting Methodologies and Tools
   - C. Review of WAN Communications

Course Requirements

Grading/exams**:** Grading procedures will be determined by the individual faculty member but will include the following: Final grades will be based primarily on homework, lab exercises, lab practical and final exam.

Other Course Information

This course is a course in Electronics Technology, Telecommunications Technology, and Computer Support Technology Programs. This course is also intended for students who wish to become a Cisco Certified Network Associate.