

COURSE OUTLINE

CCNA 4 Wide Area Network

Course Description

IN 248. CCNA 4 Wide Area Network. 3 hours credit. Prerequisites: IN 247 with a C or better. This course will enable the student to configure Wide Area Networks (WAN) and Network Address Translation (NAT) on Cisco routers and incorporate network policies using Access Control Lists (ACLs).

Course Relevance

Networks are a fundamental aspect of all business computer systems. This course is the final course of the four courses designed for those anticipating a career in network support in small-to-medium businesses, as well as enterprise and service provider environments or those seeking Cisco Certified Network Associate (CCNA) certification.

Required Materials

Vachon, B & Graziani, R. (2008). *Accessing the WAN, CCNA exploration companion guide*. Indianapolis, IN: Cisco Press.

Rullan, J. (2008). *Accessing the WAN, CCNA exploration labs and study guide*. Indianapolis, IN: Cisco

Learning Outcomes

The intention is for the student to be able to:

1. Demonstrate an understanding of WAN services.
2. Configure and apply ACLs.
3. Configure NAT for the Intranet.

Learning PACT Skills that will be DEVELOPED and/or documented in this course

Through the student's involvement in this course, he/she will develop his/her ability in the following PACT skill areas:

Technology Skills

1. Discipline-specific technology
 - Through the application of skills learned in the course the student will incorporate WAN services for network communication and basic network security.

Major Summative Assessment Task(s)

These learning outcomes and the Learning PACT skills will be demonstrated by

1. Using WAN protocols to develop a network.
2. Configuring ACLs on border routers.
3. Incorporating internetwork security by the use of NAT.

Course Content

- I. Themes – Key recurring concepts that run throughout this course:
 - A. WAN protocols
 - B. Network security
- II. Issues – Key areas of conflict that must be understood in order to achieve the intended outcome:
 - A. Decide which type of ACLs should be implemented on the routers
 - B. Identify the proper WAN protocols to be used for a network
- III. Concepts – Key concepts that must be understood to address the issues:
 - A. WAN protocol concepts
 - B. IP address subnetting
- IV. Skills/Competencies – Actions that are essential to achieve the course outcomes:
 - A. Design a WAN
 - B. Configure ACLs
 - C. Design a basic network security configuration using NAT and ACLs

Learning Units

- I. Introduction to WANs
 - A. Providing integrated services to the enterprise
 - B. WAN technology overview
 - C. WAN connection options
- II. Point-to-Point protocol (PPP)
 - A. PPP configuration options
 - B. Verifying a serial PPP encapsulation configuration
 - C. Troubleshooting PPP encapsulation
 - D. Configuring PPP with authentication
- III. Frame Relay
 - A. Introducing Frame Relay
 - B. Configuring basic Frame Relay
 - C. Advanced Frame Relay concepts
 - D. Configuring basic Frame Relay
- IV. Network security
 - A. Why is network security important?
 - B. Securing Cisco routers
 - C. Secure router network services
 - D. Secure router management
- V. ACLs
 - A. Using ACLs to secure networks
 - B. Configuring a Standard ACL
 - C. Configuring Extended ACLs
 - D. Configure Complex ACLs

- VI. Teleworker services
 - A. Business requirements for Teleworker services
 - B. Broadband services
 - C. VPN technology

- VII. IP addressing service
 - A. Dynamic Host Configuration Protocol (DHCP)
 - B. Scaling networks with NAT
 - C. Internet Protocol version 6 (IPv6)

- VIII. Network troubleshooting
 - A. Establishing the network performance baseline
 - B. Troubleshooting Methodologies and Tools
 - C. Common WAN implementation issues
 - D. Network troubleshooting

Learning Activities

Independent and collaborative learning activities will be assigned to assist the student in achieving the intended learning outcomes. Examples of activities which contribute to the learning process include, but are not limited to, the following: instructor lectures, class discussions, group tasks, quizzes, exams, lab assignments, handouts, study guides and individual conferences with the instructor.

Grade Determination

The student will be graded on assessment tasks, quizzes, exams, labs, participation and other items at the discretion of the instructor.