Western Technical College

10150140 Cisco 4: Enterprise Networking

Course Outcome Summary

Course Information

Description Topics covered in this course include PPP, ISDN, and Frame Relay. Also covered are network management and troubleshooting. This course uses project-based learning focused on advanced network design.

PLEASE NOTE: A Windows operating system is recommended for this course. Required software used in this course is not compatible with Mac operating system.

Career Cluster	Information Technology
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	90

Textbooks

No textbook required.

Program Outcomes

1. Implement computer networks.
2. Implement client systems.
3. Implement network security components.
4. Troubleshoot network systems.
5. Maintain the network infrastructure

Course Competencies

1. Implement network security procedures.

Assessment Strategies

1.1. Lab Assignment
1.2. Skills Test

Criteria

Your performance will be successful when:

1.1. Learner configures port security on a switch.
1.2. Learner performs password recovery procedures on routers.
1.3. Learner performs password recovery on switches.
1.4. Learner creates and applies VLANs to separate traffic .
1.5. Learner creates and applies ACL to filter traffic for security.
1.6. Learner creates and applies ACLs to filter traffic for traffic management.
1.7. Learner troubleshoot ACL issues.
1.8. Learner identifies Internet security threats.
1.9. Learner reviews SANS internet site for top security attack targets.

Learning Objectives

1.a. Create ACLs to filter traffic for security and traffic management.
1.b. Create VLANS to separate local traffic.
1.c. Secure access to routers and switches.

2. Monitor network traffic for baseline and performance tracking.

Assessment Strategies

2.1. Lab Assignment

Criteria

Your performance will be successful when:

2.1. Learner uses Cisco Network Assistant to observe traffic on a network.
2.2. Learner uses Cisco Network Assistant to establish baseline performance.
2.3. Learner explains the features of SNMP based software.
2.4. Learner researches various network monitoring software tools.
2.5. Learner enables NBAR to determine protocols and applications currently running on a network.
2.6. Learner uses IP flow egress and ingress on serial interfaces to capture traffic statistics.

Learning Objectives

2.a. Explain the value of using network monitoring software.
2.b. Explain the use of baseline performance data.
2.c. Explore various network monitoring software.

3. Gather and diagram a logical network.

Assessment Strategies

3.1. Lab Assignment
3.2. Skills Test

Criteria

Your performance will be successful when:

3.1. Learner uses CDP to discover neighbor devices.
3.2. Learner uses show version command to discover release levels.
3.3. Learner uses interface commands to learn IP addresses.
3.4. Learner uses telnet to access remote devices.
3.5. Learner creates inventory of discovered device features.
3.6. Learner uses Network Assistant to diagram network.
3.7. Learner establishes an account with Cisco to explore IOS features.
3.8. Learner uses Feature Navigator to configure an IOS.
3.9. Learner installs a new IOS using TFTP.

Learning Objectives

3.a. Identify commands to obtain information about an existing network.
3.b. Develop a logical network diagram.
3.c. Determine software version of IOS.

4. Identify network design considerations.

Assessment Strategies

4.1. Lab Assignment

Criteria

Your performance will be successful when:

4.1. Learner evaluates availability, performance and reliability.
4.2. Learner ensures scalability.
4.3. Learner ensures manageability.
4.4. Learner implements QoS and traffic prioritization.
4.5. Learner implements security.
4.6. Learner considers design constraints such as budget and manpower.
4.7. Learner prioritize converged traffic, data, voice and video.
4.8. Learner works within policy constraints.
4.9. Learner uses netflow commands to analyze traffic on a network.

Learning Objectives

4.a. Identify traffic types for design consideration.
4.b. Recognize the existance of constraints in any project.
4.c. Utilize techniques to maximize availability.

5. Identify management considerations of a NOC.

Assessment Strategies

5.1. Drawing/Illustration
5.2. Lab Assignment

Criteria

Your performance will be successful when:

5.1. Learner documents responsibilities of the network staff.
5.2. Learner creates a plan to review error reporting documentation.
5.3. Learner understands the importance of maintaining 99.999% (5 ,9's) availability.
5.4. Learner develops plans for securely supporting remote workers.
5.5. Learner understands the costs and maintenance contacts associated with maintaining a NOC.
5.6. Learner understands to need and use of a Business Continuity Plan.
5.7. Learner documents the physical security required in a NOC.
5.8. Learner demonstrates problems solving techniques.
5.9. Learner how to be proactive monitoring network resources.

Learning Objectives

5.a. Describe tasks associated with network management.
5.b. Describe how to manage the network.
5.c. Create documentation for Network Operations Center (NOC).

6. Implement a hierarchical IP addressing scheme.

Assessment Strategies

6.1. Written Test
6.2. Lab Assignment

Criteria

Your performance will be successful when:

6.1. Learner describes the benefits and operation of using private and public IP addressing.
6.2. Learner determines the number of subnets and hosts per subnet needed for a network design.
6.3. Learner uses VLSM to efficiently use IP addresses.
6.4. Learner implements static and dynamic addressing for hosts in a LAN environment.
6.5. Learner manually configures CIDR route summarization for EIGRP.
6.6. Learner configures EIGRP routing protocol in a WAN environment.
6.7. Learner identifies summarized routes from a routing table.
6.8. Learner displays routing table that effectively used supernetting.

Learning Objectives

6.a. Design a hierarchical IP addressing scheme.
6.b. Create a CIDR route summarization for EIGRP.
6.c. Apply a VLSM demonstrating efficient use of IP addresses.

7. Create a test plan to verify the network upgrade implementation.

Assessment Strategies

7.1. Drawing/Illustration
7.2. Lab Assignment

Criteria

Your performance will be successful when:

7.1. Learner verifies connectivity between devices using correct cables.
7.2. Learner tests VLAN configurations.
7.3. Learner reviews network traffic throughput.
7.4. Learner compares desired results with actual results.
7.5. Learner ensures all devices are configured correctly.
7.6. Learner establishes a new baseline performance standard.
7.7. Learner creates logs documenting test results.
7.8. Learner completes lab exercises using the Film Company upgrade sample.
7.9. Learner evaluates the effect of applications on a network.

Learning Objectives

7.a. Describe the difference between a prototype and pilot implementation.
7.b. Design connectivity test plans using network criteria.
7.c. Evaluate test results verifying success.

8. Prototype a WAN configuration.

Assessment Strategies

8.1. Lab Assginment

Criteria

Your performance will be successful when:

8.1. Learner configures a serial link using PPP.
8.2. Learner applies CHAP authentication to a PPP connection.
8.3. Learner tests PPP connection and authentication.
8.4. Learner configures a Frame Relay WAN link.
8.5. Learner tests a Frame Relay WAN link.
8.6. Learner configures a backup route for a WAN connection.
8.7. Learner tests the backup route for a WAN connection.
8.8. Learner installs EasyVPN.
8.9. Learner configures a VPN client.
8.10. Learner test the VPN connection.

Learning Objectives

8.a. Design a WAN configuration using frame relay.
8.b. Design a WAN configuration using PPP.
8.c. Create a VPN over a WAN.

9. Prepare a proposal to implement a network upgrade.

Assessment Strategies

9.1. Lab Assignment

Criteria

Your performance will be successful when:

9.1. Learner defines project scope.
9.2. Learner prepares executive summary.
9.3. Learner prepares a cost analysis.
9.4. Learner creates an installation schedule.
9.5. Learner creates a phased installation schedule.
9.6. Learner creates a bill of material including costs, service and maintenance.
9.7. Learner documents network specification and performance.

Learning Objectives

9.a. Identify components of project proposal.
9.b. Value the use of project management software.
9.c. Create proper documentation and training documents.