Lab 7.2.5 Testing the FilmCompany Network

Objective

- Use a test plan to test the design of a LAN.

640-802 CCNA Exam Objectives

This lab contains skills that relate to the following CCNA exam objectives:

- Interpret network diagrams.
- Determine the path between two hosts across a network.
- Select the components required to meet a network specification.
- Select the appropriate media, cables, ports, and connectors to connect switches to other network devices and hosts.
- Perform and verify initial switch configuration tasks, including remote access management.
- Verify network status and switch operation using basic utilities (including: ping, traceroute, telnet, SSH, arp, ipconfig), and **show** and **debug** commands.
- Describe enhanced switching technologies (including: VTP, RSTP, VLAN, PVSTP, 802.1q).
- Describe how VLANs create logically separate networks and the need for routing between them.
- Configure, verify, and troubleshoot VLANs.
- Configure, verify, and troubleshoot trunking on Cisco switches.
- Configure, verify, and troubleshoot inter-VLAN routing.
- Implement static and dynamic addressing services for hosts in a LAN environment.
- Select the appropriate media, cables, ports, and connectors to connect routers to other network devices and hosts.
- Access and use the router to set basic parameters, including CLI/SDM.
- Connect, configure, and verify operation status of a device interface.
- Verify device configuration and network connectivity using ping, traceroute, Telnet, SSH or other utilities.
- Perform and verify routing configuration tasks for a static or default route given specific routing requirements.

Expected Results and Success Criteria

Before starting this lab, read through the tasks that you are expected to perform. What do you expect the result of performing these tasks will be?

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How do you think having a test plan will help you test the design of the network using a prototype?

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Background / Preparation

Network designers build and test prototype networks to ensure that the elements they have included in their designs work as expected and meet the objectives of their customers. Using a test plan is one way to organize the testing and ensure that all of the design elements are tested in a way that is appropriate. Using the test plan that you completed in Lab 7.2.2, you will perform the following tests:

Test 1: Baseline Connectivity Test

- Verify physical and IP connectivity between devices on the prototype network.
- Document operation.

Test 2: VLAN Configuration Test

- Demonstrate multiple VLANs, vty, and port security.
- Verify that members of the same VLAN can communicate successfully and that members of different VLANs are not able to communicate successfully.
- Demonstrate 802.1q trunk links between devices.
- Verify STP to ensure that S1 becomes the root bridge.
- Document operation.

Test 3: VLAN Routing Test

- Demonstrate routing of traffic between separate VLANs, unrestricted.
- Demonstrate routing of traffic between separate VLANs, with restrictions.
- Document operation.

Task 1: Perform Test 1: Basic Connectivity Test

Step 1: Build the prototype network

a. Select the necessary equipment and cables as specified in the Equipment section of the test plan. See your instructor for assistance in identifying the appropriate equipment.

b. Using the topology diagram and IP address plan contained in the Design and Topology Diagram section of the test plan, connect and configure the prototype network.

c. Following the procedures in the Test 1: Procedures section, console into one of the devices and verify that you can ping all of the other device addresses. If you are unsuccessful, verify each device configuration. Repeat the connectivity testing.

d. Copy and paste the initial device configurations into a document using Notepad or a word processing program. Save or print the document to include with the completed test plan.

Step 2: Verify the functionality of the prototype network

a. Following the procedures in the Test 1: Procedures, execute the various commands and record the results of the testing.

b. Copy and paste the output of the various commands into a document using Notepad or a word processing program. Save or print the document to include with the completed test plan.

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Step 3: Record the test results in the Results and Conclusions section of the test plan

a. Compare the results that you observed during the testing with the expected results listed in the Test 1: Expected Results and Success Criteria section.

b. Determine if the testing indicates that the network meets the success criteria. If it does, indicate that the test is successful.

Task 2: Perform Test 2: VLAN Configuration Test

Step 1: Configure the prototype network

a. Follow the steps you created in the Test 2: Procedures section of the test plan to configure the VLANs on the prototype network.

b. Using the VLAN plan specified in the Design and Topology Diagram section of the test plan, configure the switches with the appropriate VLANs.

c. Configure the links between the switches as trunk links and permit all VLANs across the trunks.

d. Configure one switch to be the root bridge.

e. Configure port security on the ports attached to the two PCs to only accept one MAC address.

f. Copy and paste the initial device configurations into a document using Notepad or a word processing program. Save or print the document to include with the completed test plan.

Step 2: Verify the VLAN configuration design

a. Configure the port that connects to PC1 to be in one VLAN, and the port that connects to PC2 to be in a different VLAN.

b. Following the procedures in the Test 2: Procedures, configure each PC with an IP address that is correct for the VLAN they are assigned, using the IP addresses from the IP Address Plan in the Design and Topology Diagram section of the test plan.

c. Execute the various **show** commands to verify that the VLANs and STP are operating as expected. Copy and paste the results of the commands into a document using Notepad or a word processing program. Save or print the document to include with the completed test plan.

d. Attempt a ping from PC1 to PC2 to verify that the VLANs are successfully isolating traffic between the two PCs.

e. Record the results in the Test 2: Results and Conclusions section of the test plan.

Step 3: Record the test results in the Results and Conclusions section of the test plan

a. Compare the results that you observed during the testing with the expected results listed in the Test 2: Expected Results and Success Criteria section.

b. Determine if the testing indicates that the network meets the success criteria. If it does, indicate that the test is successful.

Task 3: Perform Test 3: VLAN Routing Test

Step 1: Configure the prototype network

a. Follow the steps you created in the Test 3: Procedures section of the test plan to configure the router to route between VLANs.

b. Using the topology diagram shown in the Design and Topology Diagram section of the test plan, configure the appropriate router to route between the VLANs created in Task 2.

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c. Following the steps you listed in the Test 3: Procedures section, console into the switch that is directly connected to the router. Configure the link between the switch and the router as an 802.1q trunk link and permit all VLANs across the trunk.

d. Console into the router and configure the router interface directly connected to the switch for 802.1q encapsulation.

e. Configure the router with the appropriate IP addresses for the various VLANs. Verify that the routes appear correctly in the routing table.

f. Copy and paste the initial device configurations into a document using Notepad or a word processing program. Save or print the document to include with the completed test plan.

Step 2: Verify the VLAN routing design

a. Verify that the PCs are configured to be in different VLANs and that the IP address configuration on the PCs is correct. Configure the IP addresses assigned to the router, in Step 1e, as the default gateway addresses for the PCs. Verify that the default gateway addresses are on the same networks as the addresses assigned to the PCs.

b. Following the procedures in the Test 3: Procedures, ping from PC1 to PC2. Copy and paste the results into a document using Notepad or a word processing program. Save or print the document to include with the completed test plan.

c. Execute the various **show** commands to verify that the routing is correct.

d. Record the results in the Test 3: Results and Conclusions section of the test plan.

Step 3: Record the test results in the Results and Conclusions section of the test plan

a. Compare the results that you observed during the testing with the expected results listed in the Test 3: Expected Results and Success Criteria section.

b. Determine if the testing indicates that the network meets the success criteria. If it does, indicate that the test is successful.

Step 4: Reflection

Was the prototype testing of the FilmCompany LAN design successful? Did having a test plan to work from help you organize your testing?

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