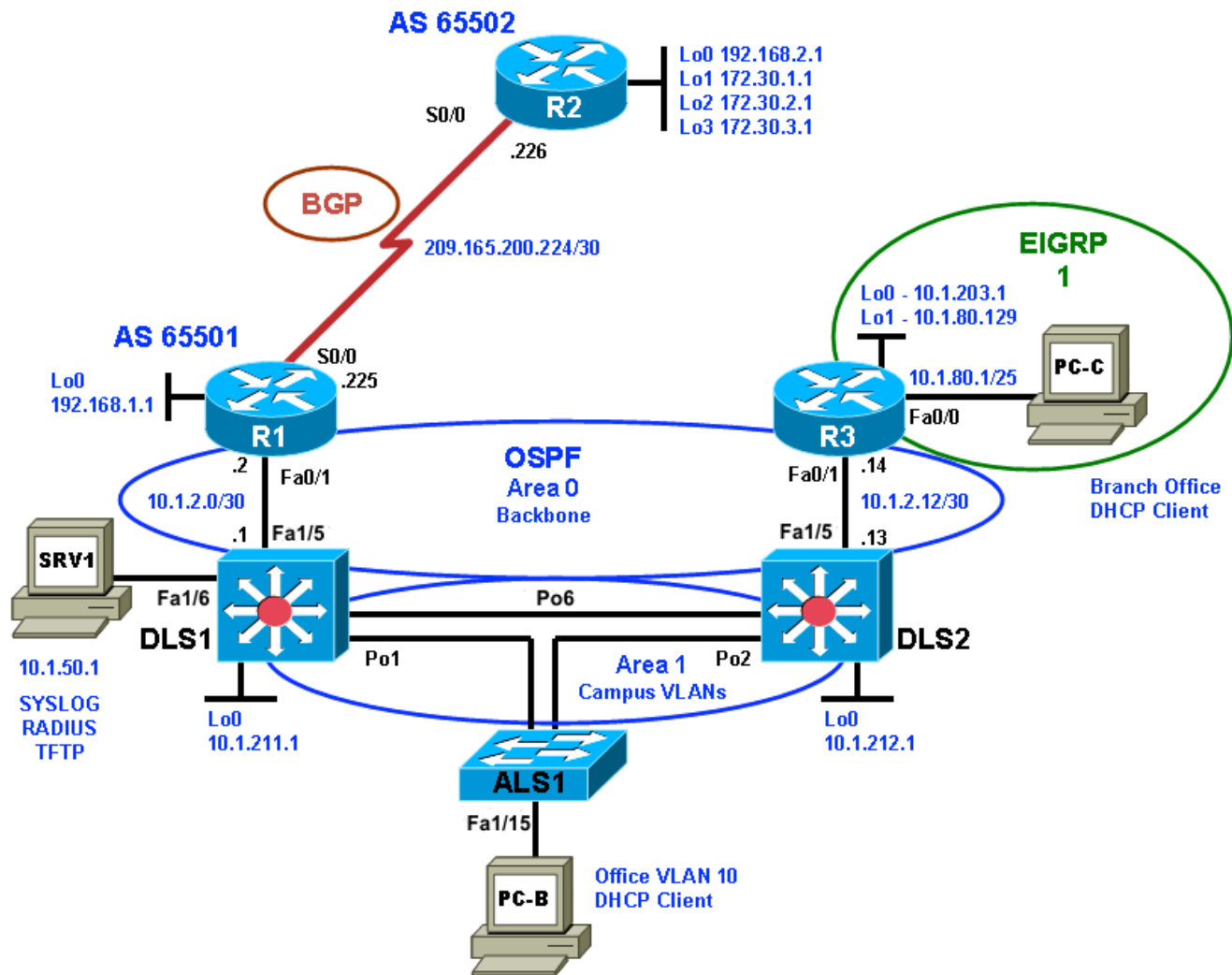**Cisco** | **Networking Academy®**
Mind Wide Open™

Lab 10-1, Troubleshooting Complex Environments

Lab Topology

Objectives

- Load the device configuration files for each trouble ticket.
- Diagnose and resolve problems related to features, protocols, or technology that could be encountered in a complex, integrated enterprise network.
- Document the troubleshooting progress, configuration changes, and problem resolution.

Background

This lab covers a range of problems and requires that you make use of the troubleshooting skills acquired throughout this course to resolve the routing and switching problems introduced. These trouble tickets are based on scenarios from previous labs. This lab focuses on routing and switching connectivity issues related to EtherChannel, STP, OSPF, EIGRP, and ACLs.

For each task or trouble ticket, the trouble scenario and problem symptom are described. While troubleshooting, you will discover the cause of the problem, correct it, and then document the process and results.

Section 1—Trouble Tickets and Troubleshooting Logs

Task 1: Trouble Ticket Lab 101-A (2 issues)

Step 1: Review trouble ticket Lab 101-A.

One of your colleagues mentioned that he had established a Telnet connection to switch ALS1 from PC-B and tested connectivity to server SRV1 via ping but was not successful. All switches in the network have a management address assigned, so he should be able to ping any device in the network. He asked for your help in determining the cause and resolving the issue.

Step 2: Load the device trouble ticket configuration files for 101-A.

a. On each device issue the command **101-A**

b. In GNS3, go to **File**, select **Save Project As,** click Yes to Message and give it name **TSHOOT-101A**

c. Shut down GNS3, restart this new project. Restart all the devices.

Step 3: Clear mac address table on DSL1 and DSL2

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a.  DLS1#clear mac

b.  DLS2#clear mac
```

Step 4: Check DHCP addresses on PC-B and PC-C.

a. Ensure that PC-B is configured as a DHCP client in the OFFICE VLAN.

b. Ensure that PC-C is configured as a DHCP client in the R3 branch office LAN.

Step 5: Document trouble ticket debrief notes.

Use this space to make notes of the key learning points that you picked up during the discussion of this trouble ticket with the instructor. The notes can include problems encountered, solutions applied, useful commands employed, alternate solutions, methods, and processes, and procedure and communication improvements.

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Task 2: Trouble Ticket Lab 101-B (2 Issues)

Step 1: Review trouble ticket Lab 101-B.

Many users on the network are experiencing problems when accessing the Internet. An office user who uses client PC-B reports that he cannot browse to a website at IP address 172.30.3.1 (simulated by R2 Lo3).

Your task is to restore connectivity from client PC-B to the Internet and ensure that the user can connect to 172.30.3.1 using ping or a web browser.

Step 2: Load the device trouble ticket configuration files for 101-B.

a.   On each device issue the command **101-B**

c.   In GNS3, go to **File**, select **Save Project As,** click Yes to Message and give it name

   TSHOOT-101B

c.   Shut down GNS3, restart this new project. Restart all the devices.

Step 3: Clear mac address table on DSL1 and DSL2

a. DLS1#**clear mac**

b. DLS2#**clear mac**

Step 4: Check DHCP addresses on PC-B and PC-C.

Ensure that PC-B and PC-C are configured as DHCP clients and have the expected IP addresses.

Note: Problems introduced into the network by the trouble ticket might prevent one or both of these PCs from acquiring an IP address. Do not assign either PC a static address.

a.   Ensure that PC-B is configured as a DHCP client in the OFFICE VLAN.

b.   Ensure that PC-C is configured as a DHCP client in the R3 branch office LAN.

Command	Key Information Displayed
`show ip route` or `show ip route` *ip-addr*	Displays the entire routing table or information for a particular destination address.
`show ip ospf interface brief`	Displays interfaces that are participating in the OSPF routing process. An interface does not need to be operational to be listed in the command output.
`show ip ospf neighbor`	Displays the OSPF neighbor table to verify that all expected neighbor relationships are operational.
`show ip bgp`	Displays local and learned network entries in the BGP table with next hop, metric, local preference, weight, and AS path.
`show ip bgp summary`	Displays a summary of the BGP neighbor table. Lists important BGP parameters, such as the AS number and router ID, statistics about the memory consumption of the various BGP data structures, and a brief overview of the configured neighbors and their state.
`show ip bgp neighbors`	Displays parameters and extensive statistics about the

	peering session for all BGP neighbors.
`show ip ospf database`	Verifies the link types and link IDs for all areas in which this device participates.

Step 5: Document trouble ticket debrief notes.

Use this space to make notes of the key learning points that you picked up during the discussion of this trouble ticket with the instructor. The notes can include problems encountered, solutions applied, useful commands employed, alternate solutions, methods, and processes, and procedure and communication improvements.

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Task 3: Trouble Ticket Lab 101-C (3 Issues)

Step 1: Review trouble ticket Lab 101-C.

The user of PC-C on the branch office network called the help desk and reported that she is unable to access SRV1 or the Internet. Your task is to restore connectivity from client PC-C to SRV1 and the Internet and ensure that the user can connect to 172.30.3.1 using ping or a web browser. The branch office administrator did some preliminary testing and reported that he cannot ping or use Telnet to DLS2 or any other network devices from R3. The capability to ping other devices from remote router R3 is a connectivity requirement for the network.

Step 2: Load the device trouble ticket configuration files for 101-C.

   a. On each device issue the command **101-C**

   c. In GNS3, go to **File**, select **Save Project As,** click Yes to Message and give it name **TSHOOT-101-C**

   d. Shut down GNS3, restart this new project. Restart all the devices.

Step 3: Clear mac address table on DSL1 and DSL2

   a.   DLS1#**clear mac**

   b.   DLS2#**clear mac**

Step 4: Check DHCP addresses on PC-B and PC-C.

   a. Ensure that PC-B is configured as a DHCP client in the OFFICE VLAN.

   b.   Ensure that PC-C is configured as a DHCP client in the R3 branch office LAN.

Command	Key Information Displayed
`show ip cef` _ip-addr_ `detail`	Displays the next hop and interface used for a particular destination address from the CEF table.
`show standby brief`	Verifies active and standby roles and IP addresses for all VLANs on an HSRP router.
`show ip eigrp interfaces`	Displays interfaces that are participating in the EIGRP routing

	process. An interface does not need to be operational to be listed in the output.
`show ip eigrp neighbors`	Displays the EIGRP neighbor table to verify that all expected neighbor relationships are operational.
`show access-lists` *ACL#/name*	Displays all ACLs configured on a device, including the ACL number and name, the type (standard or extended), the statements, and the number of matches accumulated for each statement.
`show ntp status`	Displays the clock synchronization status, stratum level, and reference clock IP address. Also shows the number of seconds since the last update was received from the reference clock.

Step 5: Document trouble ticket debrief notes.

Use this space to make notes of the key learning points that you picked up during the discussion of this trouble ticket with the instructor. The notes can include problems encountered, solutions applied, useful commands employed, alternate solutions, methods, and processes, and procedure and communication improvements.

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