



Lab 5.3.1 Troubleshooting Problems at the Physical, Data Link, and Network Layers II

Objective

Complete the laboratory exercise by defining, isolating, and correcting the problems outlined in the scenario below to restore the network to baseline specifications.

In this exercise, each workgroup will use a troubleshooting methodology and Cisco commands to define, isolate, and correct issues. You should complete the following steps:

- Define the problem by questioning users and using end-system tools
- Isolate the problem by analyzing documented symptoms and using Cisco commands
- Consider options for solving the problem
- Develop a troubleshooting implementation plan for correcting the problems you identified
- Execute your troubleshooting implementation plan
- Verify that the network is restored to baseline specifications and that you have not introduced any new problems into the network

After completing this exercise, you will be able to:

- Follow a logical troubleshooting process to define, isolate, and correct problems outlined in a trouble ticket
- Verify that the issues have been resolved
- Verify that the data flow in the network matches your network baseline

Scenario

You made it through your first few days as a second-level network support engineer for Acme and nothing too striking happened. You have spent most of your time documenting what was in place in the Acme backbone, and troubleshooting some network issues.

Yesterday, you went to a new employee orientation class. Unfortunately, you left your brand new cell phone at the office to charge.

When you return to your office, you see that users and Level 1 Support have been calling. Your phone reports 27 messages since lunch yesterday. Matt, a Level 1 engineer, has appeared in person at your office door.

Matt summarizes the situation, "We received a new management edict. They do not want any proprietary protocols in the core or distribution layer. EIGRP has to be scrapped and replaced with OSPF. Our ISP complained about our "borrowing" of AS numbers, and recommended we implement BGP confederations."

You told him that you would come up with a conversion plan this morning.

"Management insisted that we perform the conversion yesterday. We tried calling you. When we could not reach you, Joe worked on the conversion. He says he left EIGRP on the access routers since he could not get approval from those locations for an upgrade. He also completed the cutover to the frame links between the distribution and access routers. Joe said it was almost working when he left for vacation."

You realize the users have a different opinion about whether the network is working. Matt hands you a rough sketch of the planned implementation, and walks out of the room.

Required Resources

These are the resources and equipment required to complete this exercise:

- Access to a protocol analyzer (either software or hardware)
- An implementation plan for correcting documented physical, data link, or network layer problems
- An *updated* network baseline documenting the laboratory installation
- *Updated* network documentation recording the configuration of the laboratory installation
- A troubleshooting log listing isolated physical, data link, or network layer problems

Command List

As you work through the lab exercise, you may find the following list of commands helpful. The list includes router, switch, and PC commands.

Table 12: Helpful Commands

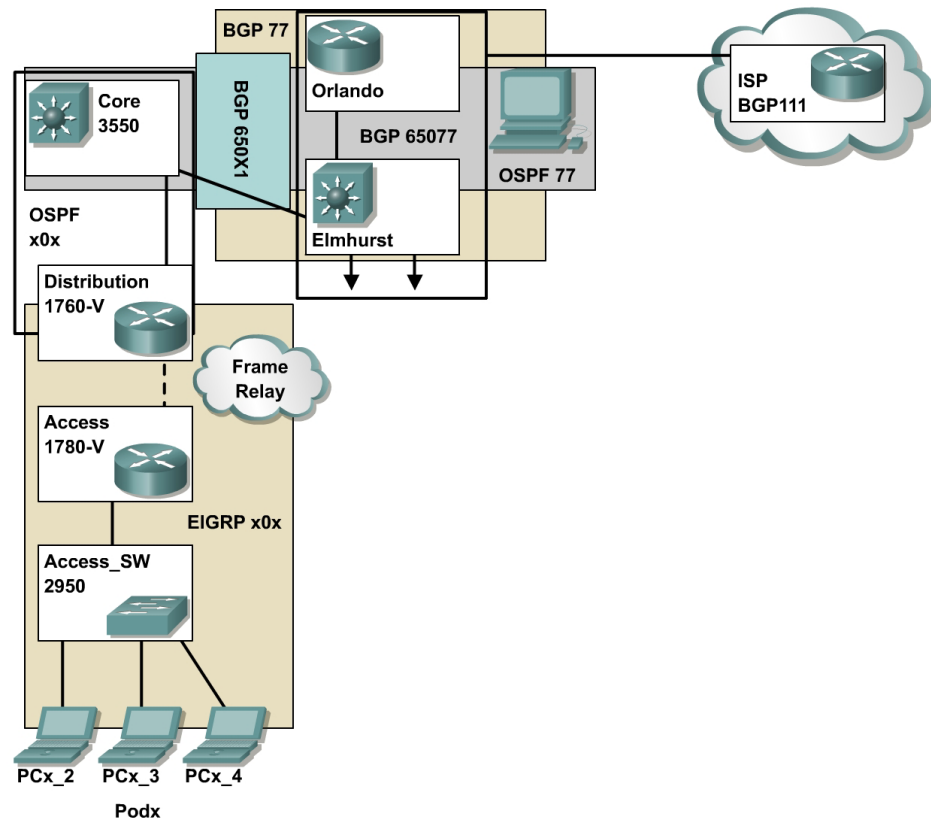
Command	Description
<code>ping {host address}</code>	Pings an IP address
<code>show cdp neighbors [detail]</code>	Displays CDP neighbor information
<code>show etherchannel summary</code>	Displays EtherChannel port-channel summary status, including layer 2 or layer 3 port and interface information
<code>show frame-relay map</code>	Displays Frame Relay mapping status
<code>show frame-relay pvc</code>	Displays Frame Relay PVC information and status
<code>show interface port-channel {channel}</code>	Displays port-channel status, including layer 2 or layer 3 port and interface information
<code>show interfaces trunk</code>	Shows trunking interfaces
<code>show ip bgp</code>	Displays entries in the BGP routing table
<code>show ip bgp summary</code>	Shows summary BGP status
<code>show ip interface brief</code>	Displays brief form of interface information
<code>show ip protocol interface</code>	Displays interface information for a protocol.
<code>show ip protocol neighbor</code>	Displays information about neighbors for a specific routing protocol.
<code>show ip protocols</code>	Displays routing protocol status
<code>show ip route</code>	Displays IP routing table information
<code>show protocols</code>	Displays layer 3 addresses and interface status
<code>show running-config interface {type number}</code>	Displays configuration information for one interface
<code>show spanning-tree</code>	Displays Spanning Tree Protocol information, including port status
<code>show vlan</code>	Displays VLAN information
<code>show vtp status</code>	Displays VTP status, including domain name and revision number

telnet { <i>ip-address</i> }	Uses Telnet to connect to an IP address
tracert { <i>ip-address</i> }	Runs Traceroute to an IP address

Troubleshooting Log: Troubleshooting Physical, Data Link, and Network Layer Problems

Problem	Solution
Core Router/Switch	
Distribution Router/Switch	
Access Router	
Access Switch	

Planned Implementation



Step 1

Resolve the trouble ticket with coordination of your group members.

What questions should you ask the users?

What commands should they try from their PC?

Step 2

Document the symptoms of the problem on the Troubleshooting Log. The Troubleshooting Log is divided into four possible areas of concern: core routing and switching, distribution routing and switching, access routing, and access switching.

Step 3

Where should you look first in the network to isolate the problems?

What commands might you use to look for issues?

Step 4

Where should you look next to isolate the problems?

What commands might you use to look for issues?

Step 5

Coordinate with your workgroup to isolate the problems.

Step 6

Repeat Steps 1–5 as needed to isolate all the problems.

Step 7

Develop a plan to correct the identified problems and document the plan in the space provided below.

Step 8

Update your network diagram to include the new routing protocols.

Step 9

Carry out your troubleshooting implementation plan to correct all network problems.

Step 10

Verify that the network data flows match the network baseline and that you have not introduced any new problems into the network.

Step 11

Do your network data flows match the network baseline? _____

Can you use Telnet to connect to the host named Cisco (simulated on ISP)? _____

Can you browse the Web files on CCNP4_Server? _____

Can you use Telnet to connect to CCNP4_Server from your PC? _____

Can you FTP a file from CCNP4_Server to your PC? _____

Is your baseline topology diagram updated to display the current routing protocols? _____