



Lab 5.2.1 Troubleshooting Problems at the Physical, Data Link, and Network Layers I

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 trouble ticket has been resolved
- Verify that the data flow in the network matches your network baseline

Scenario

A huge lightning strike wakes you up on a day off from work. A few moments later your mobile phone rings.

You recognize the phone number—it is Acme's Level 1 Network Support team.

Fred says, "The lightning has been wild over here for the last hour. We lost power twice, and also lost a router. When we powered up our spare and loaded our backup configuration, we could not get connectivity to the core."

He continues, "We called around, and several of our sites have also had power interruptions. It is probably some simple issue, but we have not been able to restore operations. We need to get this resolved quickly so payroll can be run at 7:00 AM. So we decided to call you."

It is 5:30 AM. You are awake now, so you tell him that you will connect in from home and figure out what is going on.

Required Resources

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

- Access to a protocol analyzer (either software or hardware)
- An *updated* network baseline documenting the laboratory installation

- A troubleshooting log listing isolated physical or data link problems
- An implementation plan for correcting documented physical and data link 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 11: 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 controllers {type number}</code>	Displays controller information and status
<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
<code>telnet {ip-address}</code>	Uses Telnet to connect to an IP address
<code>traceroute {ip-address}</code>	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	

Step 1

Resolve the trouble ticket by coordinating with 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, 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

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

Step 9

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

Step 10

Does 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? _____