



Lab 4.2.1 Troubleshooting Problems at the Physical and Data Link Layers

Objective

Complete the lab exercise by defining, isolating, and correcting the problems outlined in the network support activity log to restore the network to baseline specifications.

In this exercise, each workgroup will use a troubleshooting methodology and Cisco commands to start isolating issues.

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 the data flow in the network matches your network baseline

Required Resources

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

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

Scenario

You recently joined the second-level network support team for Acme. You know from baseline information you previously gathered that Acme has a hierarchy of routing and switching in the core, routing in the distribution layer, and switched LANs connecting its end users at the access layer. Last night, a contractor was supposed to perform a minor upgrade to the network core. This morning your team is reviewing a network outage:

Network Support Activity Log

Time	Report
6:46 am	Network errors are reported by the network management system. Not sure what the contractor was doing
6:51 am	The network is not functioning. He really made a mess of things. It doesn't appear that guy had any Cisco experience whatsoever, and he appears not to understand WANs either
6:54 am	The network is not functioning. Using our common passwords, he seems to have been logging into devices all over the network. Wish we had more details
7:03 am	Record whatever configuration problems you fix—we will need those when we discuss the situation with the person from accounting who insisted on selecting the lowest-price contractor

Troubleshooting Log: Troubleshooting Physical and Data Link Layer Problems

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

Command List

As you work through the case study, you may find the following list of commands helpful. The list includes router, switch, and PC commands. The commands used in this exercise should be familiar to you from previous experience or from previous CCNP courses.

Helpful Commands

Command	Description
ping <i>{host ip-address}</i>	Pings an IP address
show cdp neighbors [detail]	Displays Cisco Discovery Protocol (CDP) neighbor information
show controllers <i>{type number}</i>	Displays controller information and status
show etherchannel summary	Displays EtherChannel port-channel summary status, including Layer 2 (L2) or Layer 3 (L3) port and interface information
show frame-relay map	Displays Frame Relay mapping status
show frame-relay pvc	Displays Frame Relay permanent virtual circuit (PVC) information and status
show interfaces port- channel <i>{interface- number}</i>	Displays port-channel status, including L2 or L3 port and interface information
show interfaces trunk	Shows trunking interfaces
show ip interface brief	Displays brief form of interface information
show ip route	Displays IP routing table information
show protocols	Displays L3 addresses and interface status
show running-config	Displays device configuration information
show running-config interface <i>{type number}</i>	Displays configuration information for one interface
show spanning-tree	Displays Spanning Tree Protocol (STP) information, including port status
show version	Displays general hardware and software information
show vlan	Displays VLAN information
show vtp status	Displays VLAN Trunking Protocol (VTP) status, including domain name and revision number
telnet <i>{ip-address}</i>	Uses Telnet to connect to an IP address
traceroute <i>{ip- address}</i>	Runs Traceroute to an IP address

Step 1

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

Execute the plan you developed to correct the identified problems.

Step 9

Verify 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 ping the host named 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? _____