

# Module 17 – Build a Small Network

## Introduction to Networks – Semester 1

### Student Version

#### Module 17 Sections:

- 17.0 Introduction
- 17.1 Devices in a Small Network
- 17.2 Small Network Applications and Protocols
- 17.3 Scale to Larger Networks
- 17.4 Verify Connectivity
- 17.5 Host and IOS Commands
- 17.6 Troubleshooting Methodologies
- 17.7 Troubleshooting Scenarios
- 17.8 Module Practice and Quiz

#### Required Materials:

Reading Organizer

Packet Tracer Activities:      17.5.9 - Interpret show Command Output  
   17.7.7 - Troubleshoot Connectivity Issues  
   17.8.2 - Skills Integration Challenge  
   17.8.3 - Troubleshooting Challenge

Labs:    17.4.6 - Test Network Latency with Ping and Traceroute  
          17.7.6 - Troubleshoot Connectivity Issues  
          17.8.1 - Design and Build a Small Network

Module's 16 – 17 Exam

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Name \_\_\_\_\_ Date \_\_\_\_\_

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**Note:** The Reading Organizer has weighted scoring. Any question with the word **explain, define, or describe** in it is expected to have a longer answer and is worth two points each.

**After completion of this chapter, you should be able to:**

- Identify the devices used in a small network.
- Identify the protocols and applications used in a small network.
- Explain how a small network serves as the basis of larger networks.
- Use the output of the ping and tracert commands to verify connectivity and establish relative network performance.
- Use host and IOS commands to acquire information about the devices in a network.
- Describe common network troubleshooting methodologies
- Troubleshoot issues with devices in the network.

### 17.1 Devices in a Small Network

1. What devices will a small network likely require?

- a.
- b.
- c.
- d.
- c.
- d.

2. Small networks typically have a single WAN connection provided by \_\_\_\_\_, \_\_\_\_\_ or an \_\_\_\_\_ connection.

3. What are four factors that must be considered when selecting network devices?

- a.
- b.
- c.
- d.

4. What devices will have to be factored into the IP addressing scheme?

- a.
- b.
- c.

5. It is recommended that you plan, document, and maintain an IP addressing scheme based on \_\_\_\_\_.

6. In order to maintain a high degree of reliability, \_\_\_\_\_ is required in the network design.

7. What does redundancy help to eliminate?

8. Small networks typically provide a single exit point toward the internet via one or more default gateways. If the router fails, the entire network loses connectivity to the internet. Explain how this can be mitigated?

9. The goal for a good network design, even for a small network, is to enhance the productivity of the employees and minimize network \_\_\_\_\_.

10. A good network design will implement \_\_\_\_\_ (QoS) to classify traffic carefully according to priority.

## 17.2 Small Network Applications and Protocols

11. List and describe the two forms of software programs or processes that provide access to a network.

a. \_\_\_\_\_ -

b. \_\_\_\_\_ -

12. What are the two most common remote access solutions used to access network devices?

a.

b.

13. Which of the remote access solution is the better choice?

14. List the types of common servers found on a network.

a.

b.

c.

d.

e.

15. List the factors that a small network administrator must consider when supporting real-time applications.

- a.
- b.
- c.
- d.

### 17.3 Scale to Larger Networks

16. If your network is for a small business, presumably, you want that business to grow, and your network to grow along with it. What is this called?

17. List and describe the elements required to scale a network.

- a. \_\_\_\_\_ -
- b. \_\_\_\_\_ -
- c. \_\_\_\_\_ -
- d. \_\_\_\_\_ -

18. As the network grows, it becomes important to determine how to manage network traffic. It is important to understand the \_\_\_\_\_ that is crossing the network as well as the current \_\_\_\_\_.

19. Describe the two things that are important to determining traffic flow patterns.

a.

b.

20. What three types of information is gathered by a protocol analyzer for evaluation?

a.

b.

c.

21. List the tools that can be used to capture a “snapshot” of information on a network.

a.

b.

c.

d.

e.

f.

#### **17.4 Verify Connectivity**

22. The \_\_\_\_\_ command is the most effective way to quickly test Layer 3 connectivity between a source and destination IP address.

23. List operating systems that the ping command available for use with?

- a.
- b.
- c.
- d.

24. Describe the following ping elements.

a. ! -

b. . -

c. U -

25. On a Cisco router how do you enter an extended ping in privileged EXEC mode?

26. Traceroute can help locate \_\_\_\_\_ problem areas in a network.

27. Explain how the traceroute command works.

28. Use \_\_\_\_\_ to interrupt a tracert in Windows.

29. List the some of the problems that can be identified using the extended tracert command.

a.

b.

c.

30. One of the most effective tools for monitoring and troubleshooting network performance is to establish a \_\_\_\_\_.

### 17.5 Host and IOS Commands

31. Checking the IP addressing on host devices is a common practice in networking for verifying and troubleshooting end-to-end connectivity. In Windows 10, where can you access the IP address details?

32. What DOS command can you use to view the IP address of a Windows host?

33. What DOS command can you use to view the MAC address of a Windows host?

34. What two DOS commands can you use to release and renew a DHCP obtained IP address?

a.

b.

35. The \_\_\_\_\_ command displays all of the cached DNS entries on a Windows computer system.

36. On a Linux command line what command do network administrators use to display the status of the currently active interfaces and their IP configuration.

37. The Linux \_\_\_\_\_ command is used to display addresses and their properties.

38. In a Mac host GUI how can you get the IP addressing information?

39. Other useful macOS commands to verify the host IP settings include

\_\_\_\_\_ and the \_\_\_\_\_.

40. The arp command is executed from the Windows, Linux, or Mac command prompt. What does this command list?

41. The \_\_\_\_\_ command displays the known IP address and MAC address binding.

42. What do Cisco IOS CLI show commands display?

43. Describe the commonly used show commands shown below.

a. show running-config –

b. show interfaces –

c. show ip interface –

d. show arp –

e. show ip route –

f. show protocols –

g. show version –

44. List the information that Cisco Discovery Protocol displays about each CDP neighbor device.

- a.
- b.
- c.
- d.
- e.

45. What additional information does the show cdp neighbors detail command reveal.

46. As helpful as CDP is, it can also be a \_\_\_\_\_ because it can provide useful network infrastructure information to threat actors.

47. One of the most frequently used commands is the \_\_\_\_\_ command.

48. What information is displayed by the show ip interface brief output?

- a.
- b.
- c.

49. The \_\_\_\_\_ command can be used to verify and troubleshoot some of the basic hardware and software components used during the boot process.

### 17.6 Troubleshooting Methodologies

50. List and describe the six main steps in the troubleshooting process.

Step 1. \_\_\_\_\_ -

Step 2. \_\_\_\_\_ -

Step 3. \_\_\_\_\_ -

Step 4. \_\_\_\_\_ -

Step 5. \_\_\_\_\_ -

Step 6. \_\_\_\_\_ -

51. Explain when a problem should be escalated.

52. The IOS \_\_\_\_\_ command allows the administrator to display these messages in real-time for analysis.

53. The Cisco IOS allows for narrowing the output of debug to include only the relevant feature or subfeature. Explain why is this is important?

54. Commands such as \_\_\_\_\_ and \_\_\_\_\_ generate a substantial amount of output and can use a large portion of system resources.

55. List and describe the two ways connections can be established to access the IOS command line interface.

a. \_\_\_\_\_ -

b. \_\_\_\_\_ -

56. To display log messages on a terminal (virtual console), use the \_\_\_\_\_ privileged EXEC command. To stop logging messages on a terminal, use the \_\_\_\_\_ privileged EXEC command.

### 17.7 Troubleshooting Scenarios

57. List and describe the two duplex communication modes.

a. \_\_\_\_\_ -

b. \_\_\_\_\_ -

58. The Ethernet \_\_\_\_\_ feature facilitates configuration, minimizes problems and maximizes link performance between two interconnecting Ethernet links.

59. What are two common causes of incorrect IPv4 assignment?

a.

b.

60. On a Cisco IOS device what commands can you use to verify what IPv4 addresses are assigned to the network interfaces?

a.

b.

61. In Windows-based machines, when the device cannot contact a DHCP server, Windows will automatically assign an address belonging to the \_\_\_\_\_ range.

62. \_\_\_\_\_ (APIPA) and is designed to facilitate communication within the local network.

63. What is a default gateway for an end device?

64. If a device has an incorrect or nonexistent default gateway address, what problem can occur?

65. Because the default gateway is the path to remote networks, its address must belong to the same \_\_\_\_\_ as the end device.

66. To verify the default gateway on Windows-based computers, use the \_\_\_\_\_ command.

67. On a router, use the \_\_\_\_\_ command to list the routing table and verify that the default gateway, known as a default route,

68. \_\_\_\_\_ (DNS) defines an automated service that matches names, such as www.cisco.com, with the IP address.

69. Use the \_\_\_\_\_ as shown to verify which DNS server is in use by the Windows computer.

70. The \_\_\_\_\_ command is another useful DNS troubleshooting tool for PCs.