### **MCIS 6163: Computer Networking**

## **[Applying Concepts](#_top)**

### [Activity 1-1: Explore Network Operating Systems](#_top)

It’s easier to understand what a network operating system is if you’ve seen one or two in action. For each of the NOSs listed previously (Windows Server 2019, Ubuntu Server, and Red Hat Enterprise Linux), use your favorite search engine to complete the following steps:

1. Search for information about the NOS and write down a short description based on your findings. Include a few features and advantages and identify who develops and publishes each NOS.

**Answer:**

1. Search for images of screenshots for the NOS. What are some major elements that you notice on these screens? How are these NOSs managed?

**Answer:**

1. Find one or two introductory videos for each NOS and watch the videos. What are some similarities between each NOS? What are some of the differences?

**Answer:**

### [Activity 1-2: Troubleshoot a Failed Network Connection](#_top)

**This is a step-by-step activity. It does not require any solutions.**

Suppose your computer cannot connect to the Internet. Here’s a simple process for troubleshooting this problem that demonstrates all seven steps in the troubleshooting model. This is a step-by-step activity. It does not require any solutions.

Step 1: Identify the problem and its symptoms—You open your browser on your desktop computer, discover you can’t reach any website, and you see an error message on the browser screen. You open File Explorer and find that you can’t navigate to resources normally available on your local network. You check with coworkers nearby, who say they’re not having problems.

Step 2: Establish a theory of probable cause—Because a network technician was working near your desk when you left the evening before, you suspect your network cable might have been left unplugged. In the OSI model, you’ve started at the bottom layer by suspecting the problem is hardware related.

Step 3: Test your theory to determine the cause—You check the cable and discover it is lying on the floor, not connected to your desktop.

Step 4: Establish a plan for resolving the problem—You decide to plug in the network cable. This is a very simple resolution that does not affect other users. In other situations, your plan might involve informing coworkers of what is about to happen or possibly filing a request for formal change management.

Step 5: Implement the solution or escalate the problem—You plug in the cable.

Step 6: Verify functionality and implement preventive measures—You open your browser and find you can surf the web. You verify local network resources are available from File Explorer.

Step 7: Document findings, actions, and outcomes—This simple problem and solution don’t require formal documentation. However, network technicians are generally expected to document troubleshooting tasks and solutions. In this case, you simply inform your coworkers that your network connection is working now.

## [**Review Questions**](#_top)

1. In the client-server model, what is the primary secure protocol used for communication between a browser and web server?
   1. HTTPS
   2. TLS
   3. HTTP
   4. SSL

**Answer**:

**Explanation**:

1. Which two encryption protocols might be used to provide secure transmissions for email services?
   * + - 1. HTTP and HTTPS
         2. SSL and TLS
         3. FTP and SFTP
         4. SSH and RDP

**Answer**:

**Explanation**:

1. Which of the following applications could be used to run a website from a server?
   1. Hypertext Transfer Protocol
   2. FileZilla
   3. Microsoft Exchange Server
   4. Ngnix

**Answer**:

**Explanation**:

1. As you’re working to fix a problem with an application, you make multiple changes at once hoping that something will solve the issues you’re having. You end up with more problems than when you started. Which step, if followed correctly, would have prevented this complication?
   1. Identify the problem.
   2. Test the theory to determine the cause.
   3. Establish a plan of action to resolve the problem and identify potential effects.
   4. Document findings, actions, outcomes, and lessons learned.

**Answer**:

**Explanation**:

1. A network consists of five computers, all running Windows 10 Professional. All the computers are connected to a switch, which is connected to a router, which is connected to the Internet. Which logical networking model does the network use?
   1. Hub-and-spoke
   2. Ring
   3. Hybrid
   4. Peer-to-peer

**Answer**:

**Explanation**:

1. In Question 6, suppose one computer is upgraded from Windows 10 Professional to Windows Server 2019. Which networking model can the network now support that it could not support without the upgrade?
   1. Hybrid
   2. Client-server
   3. Hub-and-spoke
   4. Peer-to-peer

**Answer**:

**Explanation**:

1. A network consists of seven computers and a network printer, all connected directly to one switch. Which network topology does this network use?
   1. Client-server
   2. Mesh
   3. Hub-and-spoke
   4. Star

**Answer**:

**Explanation**:

1. You need to access customer records in a database as you’re planning a marketing campaign. What language can you use to pull the records most relevant to the campaign?
   1. FTP
   2. SQL
   3. SMTP
   4. TLS

**Answer**:

**Explanation**:

1. Which of the following is an application layer protocol?
   1. IP
   2. RDP
   3. TCP
   4. Apache

**Answer**:

**Explanation**:

## [**Hands-On Projects**](#_top)

### [Project 1: Explore Network Types on a Smartphone](#_top)

**[A rubric that provides guidance on evaluating answers to the Hands-on Projects and Capstone project is provided** [here](#_Rubric_for_Hands-on)**.]**

**Estimated time: 10 minutes (+10 minutes for group work, if assigned)**

**Objective: Explain the characteristics of network topologies** and network types. (Obj. 1.2)

**Group work: This project includes enhancements when assigned as a group project.**

**Resources:**

* Smartphone with cellular, Wi-Fi, and Bluetooth connection capabilities (you can borrow one from a classmate, friend, or family member)
* Access to a Wi-Fi network, such as at home, school, or a café
* Bluetooth device, such as earbuds, speaker, fitness tracker, vehicle

**Context:**

At first, it can be a little difficult to understand the differences between PANs, LANs, and WANs. However, you most likely own a device that accesses all three of these network types: your smartphone. In this project, you’ll explore the various network types your phone can connect to. Complete the following steps:

1. On the smartphone, turn on Airplane mode. Navigate to the network connections screen showing the types of connections available on the smartphone. **Take a screenshot**; submit this visual with your answers to this project’s questions.

**Answer:**

1. Within range of a Wi-Fi network that you have permission to connect to, turn on Wi-Fi on the smartphone and connect to the network. Using the phone’s browser, navigate to *cengage.com*. Does it work? What kind of network are you using to access the web page?

**Answer:**

1. Turn off Wi-Fi and turn on Bluetooth. Connect to a nearby Bluetooth device. Does it work? What kind of network are you using to access the Bluetooth device?

**Answer:**

1. Without changing any other settings, use the phone’s browser to navigate to *google.com*. Does it work? Why or why not?

**Answer:**

1. Turn off Bluetooth. Turn off Airplane mode and, if necessary, turn Wi-Fi and Bluetooth off again. Using the phone’s browser, try again to navigate to *google.com*. Does it work? Why or why not?

**Answer:**

1. What kind of network are you using to access the Internet when Wi-Fi is turned off?