Chapter 3 – Network Protocols and Communication

Study Guide

Tips for success: While answering the questions read Chapter 3, review the summary, and complete the practice Quiz.

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

- Explain how rules are used to facilitate communication.
- Explain the role of protocols and standards organizations in facilitating interoperability in network communications.
- Explain how devices on a LAN access resources in a small to medium-sized business network.

1. What process is used by source and destination hosts to negotiate correct timing for successful communication? Flow control

2. What term is used when sending a message from one-to-many recipients? Message- Multicast

3. Briefly explain each of the following Protocols in the Protocol Stack, this example uses communication between a host and a web server:
   a. Application Protocol (HTTP) – defines the content and formatting of the request. Relines on other protocol’s
   b. Transport Protocol (TCP) – divides the HTTP messages into smaller pieces. Responsible for controlling the size
   c. Internet Protocol (IP) – Responsible of taking the formatted segments from TCP, and encapsulated them into packets
   d. Network Access Protocols – Describes 2 primary functions, communication over data link and physical transmission of data

4. Complete Activity 3.2.2.4 Protocols and Layers

5. What is the difference between Open Standard and Proprietary protocols?
   - Proprietary- the intent of a proprietary protocol is to limit communication only to nodes that implement a specific application
   - Open- which can be utilized by any application. An example of an open standard is TCP/IP, the standard protocol of the Internet.

6. What are the open standard protocols for Ethernet and Wireless LANs?

7. Complete Activity 3.2.3.7 – Standards Body Scavenger Hunt

8. Briefly describe the functions of the Layers of the OSI Model:

| Application | The applications layer provides the means for end-to-end connectivity between individuals in the human network |
9. Complete Activity 3.2.4.5 – Identify Layers and Functions

10. What is data encapsulation?
    Also known as data hiding, is the mechanism whereby the implementation details of a class are kept hidden from the user. The user can only perform a restricted set of operations on the hidden members of the class by executing special functions commonly called methods.

11. Fill in the correct protocol data unit (PDU) for each layer:

<table>
<thead>
<tr>
<th>Layer</th>
<th>PDU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Layers</td>
<td>Encode Application data</td>
</tr>
<tr>
<td>Transport</td>
<td>Destination and source process numbers</td>
</tr>
<tr>
<td>Network</td>
<td>Destination and source logical network address</td>
</tr>
<tr>
<td>Data Link</td>
<td>Destination and source physical address</td>
</tr>
<tr>
<td>Physical</td>
<td>Timing and synchronization bits</td>
</tr>
</tbody>
</table>

12. What addresses are contained in the Packet Header? Network layer, IP Packets

13. What addresses are contained in the Frame Header? Data Link, Ethernet

14. An ARP Request contains the IP address of the destination device. An ARP Reply includes the MAC address associated with the IP address in the ARP Request.

15. What is the purpose of the Default Gateway?
    In computer networking, a gateway is a node (a router) on a TCP/IP network that serves as an access point to another network

16. When is an Ethernet Frame sent to the Default Gateway?
    When it connects
17. Answer the following questions based on the diagram below:

a. When sending data from PC1 to the Web Server, what is the source and destination IP address?
   
   Source: 192.168.1.100   Destination: 172.16.1.99

b. When sending data from PC1 to the Web Server, what is the source and destination MAC address?
   

c. What is the Default Gateway for PC1 and PC2? 255.255.255.0