LAB 2 - TUTORIAL
NETWORK TERMINOLOGY

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1.1 THE PLATFORM FOR COMMUNICATIONS

Communication begins with a message, or information, that must be sent from one individual or device to another. People exchange ideas using many different communication methods. All of these methods have three elements in common.

A. Concept Questions

1. What are the three elements of communication?
   - Sending communication
   - Receiving communication
   - Feedback
2. What is the process of breaking large messages, or flow of data, into smaller, easier-to-manage pieces called?
   - Segmentation
3. What is the process used to allow many different conversations to be interleaved on a network called?
   - Multiplexing
4. Modern networks primarily use three types of media to interconnect devices. What are these three types?
   - Metallic wires with cables
   - Glass or plastic fibers (fiber-optic cable)
   - Wireless transmission

B. Vocabulary Exercise: Matching

In Table 2-1, match the definition on the right with a term on the left.

Table 2-1 Components of the Network

Term	Definition	
a. Devices	b.	Cat5 cable, wireless connection, fiber-optic cable
b. Media	a.	Computer, switch, router
c. Services	c.	E-mail, web browser

In Table 2-2, identify the definition on the left with either end devices or intermediary devices on the right.

Table 2-2 End or Intermediary Device

Definition	Device Type
Computers (work stations, laptops, file servers, web servers)	End device
Mobile handheld devices (such as wireless barcode scanners, PDAs)	End device
Network access devices (hubs, switches, and wireless access points)	Intermediary device
Network printers	End device
Internetworking devices (routers)	Intermediary device
VoIP phones	End device
Communication servers and modems	Intermediary device
Security cameras	End device
Security devices (firewalls)	Intermediary device

1.2 LANS, WANS, AND INTERNETWORKS

Network infrastructures can vary greatly in terms of the following:

- The size of the area covered
- The number of users connected
- The number and types of services available

This section tests your knowledge of the differences between LANs, WANs, and internetworks.

A. Vocabulary Exercise: Completion

Fill in the blanks for the following statements.

1. The term intranet is often used to refer to a private connection of LANs and WANs that belongs to an organization and is designed to be accessible only by the organization's members, employees, or others with authorization.
2. A LAN is usually administered by a single organization.
3. WAN use specifically designed network devices to make the interconnections between LAN.
4. The media connecting the PC to the networking device plugs directly into the NIC (also known as a LAN adapter).

B. Vocabulary Exercise: Matching

In Table 2-3, match the definition on the right with a term on the left.

Table 2-3 LANs, WANs, and Internetworks

Term	Definition	
a. LANs	b.	When a company or organization has locations that are separated by large geographic distances, it might be necessary to use a telecommunications service provider (TSP) to interconnect the LANs at the different locations.
b. WANs	a.	An individual network usually spans a single geographic area, providing services and applications to people within a common organizational structure, such as a single business, campus, or region.
c. Internetworks	c.	A global mesh of interconnected networks.

In Table 2-4, match the term on the left with the correct symbol number from Figure 2-1.

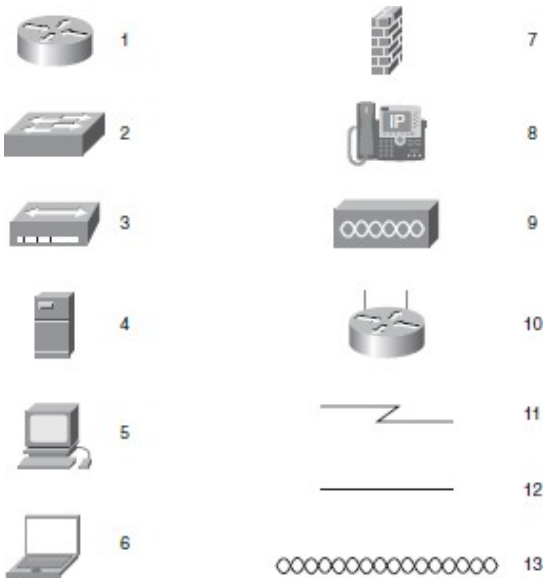

Table 2-4 LANs, WANs, and Internetworks

No	Name of Device	No	Name of Device	No	Name of Device
1	Router	5	Computer	9	Wireless Controller
2	Switch	6	Laptop	10	Wireless router
3	Small Hub	7	Firewall	11	WAN media
4	Server	8	IP phone	12	LAN media
13	Wireless media				

1.3 PROTOCOLS

All communication, whether face to face or over a network, is governed by predetermined rules called protocols. These protocols are specific to the characteristics of the conversation.

A. Vocabulary Exercise: Completion

Fill in the blanks for the following statements.

1. Successful communication between hosts on a network requires the interaction of many different protocols. A group of interrelated protocols that are necessary to perform a communication function is called a protocol suite.
2. All communication, whether face to face or over a network, is governed by predetermined rules called protocols.
3. A TCP/IP is a process or protocol that has been endorsed by the networking industry andratified by a standards organization.
4. The most common internetwork protocol is IPv4.

B. Concept Questions

1. What processes do networking protocol suites describe?
   - The format or structure of the message
   - The method by which networking devices share information about pathways with other networks
   - How and when error and system messages are passed between devices
   - The set-up and termination of data transfer sessions.
2. What are some benefits to using a layered model to describe network protocols and operations?
   - Assists in protocol design
   - Prevents a technology that functions at one layer from affecting any other layer
   - Provides a common language for describing network functionality
   - Helps in visualizing the interaction between each layer and protocols between each layer

1.4 USING LAYERED MODELS

To visualize the interaction between various protocols, it is common to use a layered model. A layered model depicts the operation of the protocols occurring within each layer, and the interaction with the layers above and below it.

Vocabulary Exercise: Matching

In Table 2-5, match the definition on the right with a term on the left.

Table 2-5 TCP/IP Model

Term	Definition	
a. Application layer	b.	Uses packet sequencing and application mapping through port numbers
b. Transport layer	a.	Represents data to the user plus encoding and dialog control
c. Internet layer	d.	Controls the hardware devices and media that make up the network
d. Network access layer	c.	Determines the best path through the network

In Table 2-6, match the definition on the right with a term on the left.

Table 2-6 OSI Model

Term	Definition	
a. Application layer	f.	Protocols describe methods for exchanging data frames between devices over a common media.
b. Presentation layer	a.	Provides the means for end-to-end connectivity between individuals in the human network using data networks.
c. Session layer	g.	Describes the mechanical, electrical, functional, and procedural means to activate, maintain, and deactivate physical connections for bit transmission to and from a network device.
d. Transport layer	c.	Provides services to the presentation layer to organize its dialogue and to manage data exchange. Ensures that loss of connection can be recovered and reset if data flow is interrupted before all data is received.
e. Network layer	b.	Provides for common representation of the data transferred between application layer services.
f. Data link layer	e.	Provides connectivity services that route packets from source network to destination network.
g. Physical layer	d.	Defines services to segment, transfer, and reassemble the data for individual communications between the end devices.

A. Vocabulary Exercise: Completion

Fill in the blanks for the following statements.

1. The first identifier, the host physical address, is contained in the header of the Layer 2 protocol data unit (PDU), called a frame. Layer 2 is concerned with the delivery of messages on a single local network. The Layer 2 address is unique on the local network and represents the address of the end device on the physical media. In a LAN using Ethernet, this address is called the MAC address.
2. A unique dialogue between devices is identified with a pair of Layer 4 source and destination Port numbers that are representative of the two communicating applications.

B. Multiple-Choice Questions

Choose the best answer for each of the questions that follow.

1. What kind of protocols are primarily designed to move data from one local network to another local network within an internetwork?

   A. Layer 1
   B. Layer 2
   C. Layer 3
   D. Layer 4

2. Which devices make Layer 3 decisions?

   A. Routers
   B. Switches
   C. Hubs
   D. Servers