Microsoft
Technology
Associate

Preparing Students for
MTA Certification

MICROSOFT TECHNOLOGY ASSOCIATE

Exam Review Kit

EXAM 98-366
Networking Fundamentals

Microsoft

Student Activity Workbook

STUDENT ACTIVITY 1.1
COMPARING NETWORKS

Answer the following questions.

1. Define Internet.

2. Define Intranet.

3. Define Extranet.

4. Define VPN.

5. Define Security Zone.

6. Define Firewall.

7. Discuss how a business would achieve creating security zones through the use of firewalls and VPNs for their intranet and extranets.

8. Intranet & Extranet. Do you think a single term should be used or are both terms necessary? Justify your point of view.

9. The Internet has been called the "Information Superhighway." Define the Internet and discuss why you would agree or disagree with this alternative label for the Internet.

10. Provide a brief overview of each of the four basic features common to all VPN connections.

11. A company wants to connect all employees' computers so they can share information without accessing the Internet—what type of network should they implement?

STUDENT ACTIVITY 1.2
UNDERSTAND THE LOCAL AREA NETWORKS

Answer the following questions.

1. Define LAN and its uses.

2. Define Perimeter Network.

3. What are the private IP ranges>

4. Who allocates IP addresses?

5. What is a loopback and its purpose?

6. Define ICS.

STUDENT ACTIVITY 1.3
UNDERSTAND VLANS, WIRED LANS, AND WIRELESS LANS

Answer the following questions.

1. Define wired LAN and its advantages/disadvantages.

2. Define wireless LAN and its advantages/disadvantages.

3. What are the two wireless modes?

4. Define VLAN and its purposes.

5. Why is a VLAN sometimes referred to as a "logical network"?

STUDENT ACTIVITY 1.4
WIDE AREA NETWORKS

Answer the following questions:

1. Define Dial-Up.

2. Define ISDN.

3. Define Leased Lines.

4. Define VPN and its requirements.

5. Define WAN.

6. What device connects LANs to WANs?

7. Compare networks and discuss the relationship of a wide area network to a local area network and a virtual private network.

8. How do leased lines, dial-up, and ISDN relate to wide area networks?

9. Identify which type of network is strictly used within an organization's network.
   a. MAN
   b. WAN
   c. LAN
   d. VLAN

10. Identify the type of networking that provides for long-distance transmission of data, voice, image, and video information between states and countries.
    a. LAN
    b. MAN
    c. VAN
    d. WAN

STUDENT ACTIVITY 1.5
WIDE AREA NETWORKS CONNECTIONS

Answer the following questions:

1. Define T1 connection.

2. Define T3 connection.

3. Define E1 connection.

4. Define E3 connection.

5. Define DSL connection.

6. Define cable connection.

7. Identify a high-speed digital communications network evolving from existing telephone services.
   a. VPN
   b. ISDN
   c. TCP/IP
   d. DATA

8. Remote server access provides what two different types of remote access connectivity?
   a. Dial-up remote access and virtual private network (VPN) remote access.
   b. VPN and dial-up remote access
   c. TCP/IP and VPN
   d. VPN and dial-up remote access

9. Identify a communications channel that permanently connects two or more locations.
   a. Dedicated connection
   b. Private line
   c. Leased line
   d. All (a, b, c)

STUDENT ACTIVITY 1.6
UNDERSTAND WIRELESS NETWORKING CONNECTIONS & SECURITY

Answer the following questions:

1. The data rate of a computer network connection is measured in _____.

2. Define IEEE.

3. Compare and contrast the wireless transmission methods.

4. Define PSK.

5. Define TKIP.

6. Compare WEP and WPA by creating a list of the advantages and disadvantages of each.

7. Define Bridging.

8. Define PPP.

STUDENT ACTIVITY 1.7
UNDERSTANDING NETWORK TOPOLOGIES AND ACCESS METHODS

Answer the following questions:

1. Define Physical Topology.

2. Define Logical Topology.

3. Define, compare, and contrast all the different network topologies.

STUDENT ACTIVITY 2.1
UNDERSTANDING SWITCHES

Answer the following questions:

1. Define Switch.

2. Define Multi-layer Switch.

3. Define OSI.

4. Define Bandwidth.

5. Define Micro-segmentation.

6. Define Half-Duplex.

7. Define Full-Duplex.

8. Define Uplink.

9. Compare and contrast Managed vs Unmanaged switches.

10. How do VLANs affect broadcast domains?

11. A network switch is …
   a. A computer networking device that connects network segments.
   b. An electronic device that receives a signal and retransmits it onto the other side of an obstruction or at a higher level or power.
   c. A networking device that connects only a whole campus to a corporation

12. An Ethernet is …
   a. A physical network segment where data packets are linked.
   b. A family of frame-based computer networking technologies for local area networks.
   c. A network in which the nodes are linked exclusively by wireless networks.

13. An unmanaged switch is also called "dumb" because …
   a. The system administrator can take control of the network and allow ports to talk to other ports or none at all.
   b. It uses full bandwidth to each port.
   c. It allows all traffic to go all through the network and the administrator has no control.

14. An uplink port …
   a. Does not crossover the transmit and receive pins.
   b. Cannot be configured to act as trunk ports by connecting the access switch with the distribution switch.
   c. Can be connected to another uplink port with a straight-thru cable and to a regular port with a crossover cable to connect a PC.

15. A managed switch …
   a. Has its own IP address.
   b. Does not have telnet.
   c. Does not have a web-based interface.

16. When a hub receives a packet of data at one of its ports from a PC on the network, …
   a. It transmits the packet to all of its ports and collision occurs on all of the other PCs on the network.
   b. It transmits the packet to all of its ports and, thus, to all of the other PCs on the network.
   c. It must notify all other PCs on the network.

17. A crossover cable …
   a. Has different ends.
   b. Has identical ends.

18. A layer …
   a. Is defined when services are received from the layer above it and provided to the layer below it.
   b. Is a way of subdividing a system into smaller parts.
   c. Uses an "instance" to provide service to all associated layers.

19. Virtual LANS (VLANs) …
   a. Break up different ports on a switch into different switches.
   b. Make a pretend local area network.
   c. Is not an accepted kind of network in the business world.

STUDENT ACTIVITY 2.2
UNDERSTANDING SWITCHES

Answer the following questions:

1. Define Switch Security.

2. Hardware Redundancy.

3. Define Circuit Switching.

4. Define Packet Switching.

5. Define Cell Relay Switching.

STUDENT ACTIVITY 2.3
UNDERSTANDING ROUTERS

Answer the following questions:

1. What are the three main functions of a router?

2. Define IGP

3. Define Static Routing.

4. Define Dynamic Routing.

5. What is the purpose of the routing table?

6. Define NAT.

7. Define RRAS

Match the following numbers to the term:

_____Router   _____Routing table memory

_____Transmission speed considerations   _____Software routing in Windows Server

_____Static routing   _____Dynamic routing (routing protocols)

_____Directly connected routes   _____Routing table and how it selects best
                                                                             routes.

_____NAT

1. A device that selectively interchanges packets of data in two or more computer networks while connecting the networks.

2. Data can be transmitted from place to place at a measured kilobits transmission speed called the bandwidth.

3. Are considered to be the static routes that point to an interface by the routing table.

4. Static routes are configured at startup and don't change unless a user changes them. It is not a protocol.

5. The network route used by a router when no other known route exists for a given IP packet's destination address.

6. Software applications that dynamically discover network destinations and how to get to them are dynamic routing protocols.

7. Routing information base (RIB) is an electronic table *(file)* or database type object that is stored in a networked computer or a router.

8. The table is an in-memory database file managed by the router's built-in hardware and software.

9. The network address translation is the process of modifying network address information in datagram (IP) packet headers while in transit across a traffic routing device.

10. RRAS is an open platform for routing and networking and a software router. It uses a virtual private network (VPN) or dial-up connections in Windows Server and supports remote user or site-to-site connectivity.

STUDENT ACTIVITY 2.4
UNDERSTANDING MEDIA TYPES

Answer the following questions:

1. What are the common types of media?

2. Define EMI.

3. Compare and contrast UTP, STP, and ScTP.

Type	Cable Type	Max Distance	Connection Ends	Speed
10Base2				
10Base5				
10BaseT				
100BaseTX				
LC MM Fiber				
SC SM Fiber				

STUDENT ACTIVITY 3.1
UNDERSTAND THE OSI MODEL

Answer the following questions:

1. Define Internetwork.

2. Define OSI.

3. Define ISO.

4. Define ITU-T

5. Define IETF

6. Define Protocol.

7. Define Encapsulation and its process.

	OSI Model Layer	Encapsulation	Devices	Protocols	TCP/IP Model Layer
7					
6					
5					
4					
3					
2					
1					

9. Matching:

A. Application, presentation, session, transport, network, data link, physical

B. Voltage levels, time of voltage changes, physical data rates, maximum transmission distances, physical connectors, and type of media

C. Two

D. Three

E. Seven

F. Layer 3, the network layer.

G. Protocol

H. Routing protocol

I. ITU-T

J. IETF

1. _____ What are the layers of the OSI model?

2. _____ Which layer determines path selection in an internetwork?

3. _____ What is defined at the physical layer?

4. _____ What directs the way computers exchange information over a network medium?

5. _____ How many sets of layers make up the OSI Layers?

6. _____ How many layers are in the Open System Interconnection?

7. _____ Defines rules for exchanging information between routers.

8. _____ What is the name of the standards agency for OSI?

STUDENT ACTIVITY 3.2
UNDERSTAND THE OSI MODEL

Answer the following questions:

1. Define TCP/IP.

2. Define IPSec.

3. Define TCP.

4. Define UDP.

5. Well Known Ports:

   a. FTP

   b. SSH

   c. Telnet

   d. SMTP

   e. DHCP

   f. TFTP

   g. HTTP

   h. POP3

   i. IMAP

   j. HTTPS

6. A packet whose destination is outside the local TCP/IP network segment is sent to
   a. fileserver
   b. default gateway
   c. DNS server
   d. DHCP server

7. Why was the OSI model developed?
   a. Manufacturers disliked the TCP/IP protocol suite.
   b. The rate of data transfer was increasing exponentially.
   c. Standards were needed to allow any two systems to communicate.
   d. None of these

8. Which piece of information is not vital for a computer in a TCP/IP network?
    a. IP address
    b. default gateway
    c. subnet mask
    d. DNS server

9. The physical layer is concerned with the physical medium movement of what?
    a. programs
    b. dialogs
    c. protocols
    d. bits

10. Which one of the following functionalities is provided by IP?
    a. dialogs
    b. bits
    c. programs
    d. addressing

11. Which of the following can be an Ethernet physical address?
    a. 01:02:01:2C:4B
    b. 07:01:02:01:2C:4B:2C
    c. 07:01:02:01:2C:4B

12. An IP address contains how many bits?
    a. 8
    b. 16
    c. 32
    d. 64

13. Which IP address is reserved for software loopback?
    a. 224.x.x.x
    b. 127.x.x.x
    c. 0.0.0.0
    d. 255.255.255.255

14. Which port is reserved for use of the SMTP protocol?
    a. 21
    b. 23
    c. 25
    d. 27

15. Which one of the following is a connectionless protocol?
    a. UDP
    b. TCP
    c. OSI
    d. ISO

STUDENT ACTIVITY 3.3
UNDERSTADING IPV4

Answer the following questions:

1. Define IPv4.

2. Define the classes, their ranges, and formulas.

3. Define Classful networking.

4. Define CIDR.

5. Define Supernetting.

6. Define Private networks and their ranges.

7. Define APIPA.

8. Define Localhost.

9. Define Network address.

10. Define Broadcast address.

11. Define Default Gateway.

12. Compare and contract static vs dynamic addressing.

13. What contributes to the problems associated with IP V4?

a. Most of Class C are too small to be useful and Class B addresses have already been assigned
b. Even though there is a field for TOS in the IPV4 header, routers do not pay attention to it.
c. IP packets can be easily snooped from the network.
d. No standard for authentication of the user to a server or encryption of data in packets
e. Maximum packet size is 2^16–1 (65,535); packets may be too small considering newer, faster networks.
f. All of the above.

14. IPv4 uses what size addresses?
    a. 16 bit
    b. 32 bit
    c. 48 bit
    d. 64 bit

15. IPv4 addresses are usually written in
    a. dot-decimal notation
    b. with no notation
    c. five octets of the address
    d. base format

16. Supernetting allows
    a. route aggregation
    b. five octets of the address
    c. 48 bit
    d. base format

17. The number of local networks IANA reserved IP address space for private internets
    a. 8 blocks
    b. 6 blocks
    c. 7 blocks
    d. 3 blocks

18. Virtual private networks are needed to communicate between
    a. two private networks
    b. military networks
    c. education networks
    d. two public networks

19. A broadcast address is an address that allows
    a. information to be hidden.
    b. information to be sent to all machines on a given subnet.
    c. information kept on servers only.

STUDENT ACTIVITY 3.4
UNDERSTAND IPV6

Answer the following questions:

1. Define Teredo.

2. Define ISATAP.

3. Define Dual Stack.

4. Define GLBP.

5. Define IPv6.

6. Define Unicast.

7. Define Multicast.

8. Define Anycast.

9. What is the current IP standard?
    a. IPv4
    b. IPv5
    c. IPv6

10. What is the main reason for IPv6 being developed?
    a. Not enough MAC numbers in earlier versions
    b. To make more addressing available for new or additional use
    c. Newer hardware required the change

11. How many bits does the new addressing provide?
    a. 16 bit
    b. 24 bit
    c. 32 bit
    d. 40 bit
    e. 128 bit

12. What benefits does IPv6 provide?
    a. IPv6 solves the International Address Allocation problem.
    b. IPv6 restores end-to-end communication—makes NATs no longer necessary.
    c. IPv6 solves the address depletion problem.
    d. All of the above

13. What are the different classifications of IPv6 addresses?
    a. Unicast, videocast, and anycast
    b. Audiocasat, multicast, and anycast
    c. Unicast, multicast, and simulcast
    d. Unicast, multicast, and anycast

14. What is unicast?
    a. Communication between a single host and a single receiver
    b. Communication between a single host and multiple receivers
    c. Communication between a single sender and a list of addresses
    d. Both a and c

15. What is multicast?
    a. Communication between a single host and a single receiver
    b. Communication between a single host and multiple receivers
    c. Communication between a single sender and a list of addresses
    d. Both b and c

16. What is anycast?
    a. Communication between a single host and a single receiver
    b. Communication between a single host and multiple receivers
    c. Communication between a single sender and a list of addresses
    d. Both b and c

STUDENT ACTIVITY 3.5
UNDERSTAND IPV6

Answer the following questions:

1. Define ULA.

Prefix	Designation	IPv4 equivalent

2. What is a tunnel?
    a. A passageway around an electronic obstruction that allows data to move
    b. An underground cable passage or system of passages
    c. A logical structure that encapsulates the data of one protocol inside the Payload or Data field of another protocol
    d. Part of an application used for hiding data in route to a server

3. IPv4 uses a 32-bit addressing scheme. What does IPv6 use?
    a. 16-bit
    b. 56-bit
    c. 64-bit
    d. 128-bit

4. As a security practitioner, which autoconfiguration technique should you be most concerned about?
    a. Stateful configuration
    b. Stateless configuration
    c. Unstated configuration

5. IPv6 describes rules for the following types of addressing. Which is the communication between a single sender and the nearest of several receivers in a group?
    a. Anycast
    b. Unicast
    c. Multicast
    d. Singlecast

6. Match the following:
    A. Anti-replay protocol
    B. Session initiation protocol
    C. Internet message access protocol
    D. Exterior gateway protocol
    E. Internet open trading protocol
    F. Layer two tunneling protocol
    G. Next hop resolution protocol
    H. Dynamic host configuration protocol
    I. Transmission control protocol
    J. Common management information protocol

    1. _____ Communications protocol that lets network administrators centrally manage and automate the assignment of Internet protocol (IP) addresses in an organization's network

    2. _____ An Internet Engineering Task Force (IETF) standard protocol for initiating an interactive user session that involves multimedia elements such as video, voice, chat, gaming, and virtual reality

    3. _____ Extension of the point-to-point tunneling protocol is used by an Internet service provider to enable the operation of a virtual private network over the Internet

    4. _____ Protocol used to exchange routing information between two gateway hosts (each with its own router) in a network of autonomous systems

    5. _____ Protocol that allows a computer sending data to another computer to learn the most direct route to the receiving computer

    6. _____ Protocol is one of several standards proposed to ensure that manufacturers, distributors, retailers, and shoppers all use a common method of exchanging data when doing business online

    7. _____ Protocol for accessing e-mail from your local server

    8. _____ Protocol is used to keep track of the individual units of data (called packets) that a message is divided into for efficient routing through the Internet

    9. _____ Protocol ensures IP packet-level security by making it impossible for a hacker to intercept message packets and insert changed packets into the data stream between a source computer and a destination computer

STUDENT ACTIVITY 3.6
UNDERSTAND NAME RESOLUTION

Answer the following questions:

1. Define Name Server.

2. Define WINS.

3. Define DNS.

4. Define Resolvers.

5. Define Root Domain.

6. Describe the basic steps in the DNS name resolution process.

7. DNS name resolution is both _____ and _____ resolution.

8. What port does DNS use?
    a. Port 53
    b. Port 22
    c. Primary
    d. Secondary

9. What is the most common record type in DNS?
    a. Perimeter network records
    b. Primary DNS server records
    c. Host (A) records
    d. Root hints

10. What do DNS service (SRV) records do?
    a. Remove stale records
    b. Indicate the location of a particular service
    c. Identify dynamic, read-write, and read-only files
    d. Reconcile secondary DNS servers and DNS on RODCs

11. Which of the following would occur first in the NetBIOS name resolution process?
    a. Verify WINS used
    b. Check LMHOSTs file
    c. Broadcast request
    d. Check NetBIOS name cache

12. Which of the following maintains information about the part of the DNS namespace for which it is responsible in a text file on the local hard disk of the DNS server?
    a. Stub zone
    b. Primary zone
    c. Secondary zone
    d. Active Directory-integrated zone

STUDENT ACTIVITY 3.7
UNDERSTAND NETWORKING SERVICES

Answer the following questions:

1. Common network services include:

2. Define DHCP.

3. What are three ways to obtain an IP address?

4. What are the four phases of DHCP allocation?

5. Define IPSec.

6. The two basic mechanisms in DHCP are:
    a. IP address allocation and configuration parameters delivery
    b. Automatic and manual address allocation
    c. DHCP protocol and DHCP extensions
    d. IP address allocation by DHCP and its co-existence with other address configuration management schemes

7. A relay agent is:
    a. A router using the DHCP protocol
    b. A DHCP host you can rely on
    c. A host or router that passes on DHCP messages
    d. All of the above

8. Relay agents were created for:
    a. Saving the need for a DHCP/BOOTP server on each subnet
    b. BOOTP compatibility
    c. Interoperation of BOOTP clients with DHCP servers
    d. None of the above
    e. All of the above

9. BOOTP is a _____ configuration protocol.
    a. static
    b. dynamic
    c. both dynamic and static
    d. None of the above

10. DHCP is a _____ configuration protocol.
    a. dynamic
    b. static
    c. both dynamic and static
    d. None of the above

11. When the DHCP client first starts, it is in the _____ state.
    a. selecting
    b. initializing
    c. requesting
    d. None of the above

12. After sending the DHCPDISCOVER message, the client goes to the _____ state.
    a. selecting
    b. initializing
    c. requesting
    d. None of the above

13. Remote Access server uses two modes, which are:
    a. Topic and transport
    b. Tunnel and topic
    c. Transport and static
    d. Tunnel and transport

14. Common network services include:
    a. E-mail and printing
    b. DNS and DHCP
    c. Directory services
    d. Authentication services
    e. All of the above

15. What is the most significant change of DHCP over BOOTP?
    a. The extension mechanism
    b. Dynamic IP binding and the idea of a lease
    c. The configuration parameters' delivery mechanism
    d. Saving one extra letter in the protocol acronym
    e. None of the above

STUDENT ACTIVITY 3.8
UNDERSTAND TCP/IP

Answer the following questions:

1. Define Ping.

2. Define Netstat.

3. Define Tracert.

4. Define Ipconfig.

5. Define Pingpath.

6. Define Telnet.

7. Which element is vital for a computer in a TCP/IP network?
    a. IP address
    b. Default gateway
    c. Subnet mask
    d. DNS server

8. Which IP address is reserved for software loopback?
    a. 224.x.x.x
    b. 127.x.x.x
    c. 0.0.0.0
    d. 255.255.255.255

9. Packets in the IP layer are called _____.
    a. segments
    b. datagrams
    c. frames
    d. None of the above

10. A TCP segment is encapsulated in _____.
    a. IP datagram
    b. an Ethernet frame
    c. a UDP user datagram
    d. None of the above

11. The timer prevents a long idle connection between two TCPs and is called _____,
    a. retransmission
    b. persistence
    c. keep alive
    d. none of the above

12. Match the definitions to the correct term.

    A. TCP/IP
    B. Tracert
    C. Telnet
    D. Netstat
    E. Addresses for local use
    F. Local loopback IP
    G. Ping
    H. Pathping
    I. Protocol
    J. Ipconfig

1. _____ Range of 169.254.0.0 to 169.254.255.255

2. _____ Show the route taken by packets across an IP network

3. _____ Displays the degree of packet loss at any given router or link

4. _____ Displays current TCP/IP network connections and protocol values

5. _____ A protocol used on local area networks, a terminal emulation program for TCP/IP networks

6. _____ One of the core protocols of the Internet Protocol Suite that provides reliable, ordered delivery of a stream of bytes

7. _____ Used to test the TCP/IP protocol implementation on a host using a special range of addresses

8. _____ Displays all current TCP/IP network configuration values and refreshes DHCP and DNS settings

9. _____ A formal description of message formats and the rules for exchanging those messages