

CS610 130+ Mcqs
Spring 2022 #Mid-Term
WITH PROVE ANSWER
ORANGE MONKEY TEAM

Important NOTE:-

Maybe toppers are successful in school or college carrier but backbenchers are successful in their life because toppers run according to books while backbenchers don't follow rules and regulation that is why backbenchers are successful. For life, there are no books and another reason why toppers can't succeed because they fear failure and don't try anything new. Backbenchers don't fear failure as they have faced the failure in their school or college carrier so that is the reason they try new things and at last gain success.

As Abdul Kalam nicely quoted, "The best brains of the nation may be found on the last benches of the classroom"

ORANGE MONKEY TEAM

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the name of Allah, the most gracious, the most merciful

1. When an application ____ any data, it makes a copy of the data available to all other computers on the network.

Multicast.....confirm

2. There are ____ types of data stuffing

2....confirm

There are two types of data stuffing:

- Byte Stuffing
- Bit Stuffing

3. Which of the following is a benefit of direct point to point communication?

Security implementation.....confirm

133. Which of the following is a benefit of point to point communication?

- Quick to configure
- Security implementation

4. If you as a network administrator want to know the traffic flow of your data while communicating with a remote computer which of the following will be used to know about intermediate routers?

Ping.....confirm

81. If you as a network administrator want to know the traffic flow of your data while communicating with a remote computer which of the following will be used to know about intermediate routers?

- Ipconfig
- **Ping** page 11
- Traceroute

5. Which of the following network is using the TCP/IP model globally?

The internet....confirm

Which of the following network is using the TCP/IP model globally?

- PAN
- SAN
- LAN
- **The Internet**

6. In which type of error detection the arithmetic sum is calculated before and after the transmission of data at both communication ends?

Checksum.....confirm

CHECKSUM

The second procedure used to detect errors is checksum. In this procedure data is treated as a sequence of integers and their arithmetic sum is computed and the carry bits are added to the final sum. Then checksum is calculated by transmission then it is sent along the data and the receiver and the same calculation is performed and then compared with the original checksum transmitted. In this way errors are detected if the received checksum is different from the sent. The figure illustrates the example.

7. Hardware address is also called _____.

Physical address.....confirm

Hardware address is also called _____.

- Physical address
- Logical address

8. The sharing of a _____ among the workers in an office is a goal of resource sharing
Printer....confirm

user.

For example: the sharing of a printer among the workers in an office and also the sharing of information is a goal of resource sharing.

9. Thick Ethernet also requires _____ to avoid signal reflectance
Terminators...confirm

signal on coax cable. The wires in AUI carry digital signals.
Thick Ethernet also requires terminators to avoid signal reflection.
The figure below:

10. The _____ Field of Ethernet frame has the purpose of frame payload.

Data....confirm

FIELD	PURPOSE
Preamble	Receiver synchronization
Destination Address	Identifies intended receiver
Source Address	Hardware address of sender
Frame Type	Type of data carried in frame
Data	Frame payload
CRC	32-bit CRC code

11. In _____ each station is allocated time slot during which it can send data. Each station transmits its data in its assigned time slot.

TDMA...confirm

18. In _____ each station is allocated a **time slot** during which it can send data. Each station transmits its data in its assigned **time slot**.

- A) TDMA
- B) CDMA
- C) FDMA
- D) none of the above

View Answer:

Answer: Option A

12. In _____ all computers are attached to a central hub

Star topology.....confirm

STAR TOPOLOGY:

In this topology, **all computers** are attached to a central point, which is sometimes called the "Hub" as shown in the figure below.

13. In which topology terminators are used at the end of the cable?

Bus....confirm

2. Terminators are used in _____ topology.

- a. Bus
- b. Star

Answer : a

14. A network uses _____ to arrange computers in a single closed loop.

Ring topology...confirm

A network uses _____ to arrange computers to be connected in a **single closed** loop.

Select correct option:

- Star Topology
- Dual Ring Topology
- Ring Topology**
- Bus Topology

15. LAN interface uses _____ to copy frame data directly from main memory

DMA....confirm

LAN interface may use _____ to copy frame data directly from main memory.

DMA
FDDI
CSMA/CD
None of the given

16. In direct point to point communication adding the Nth computer requires _____ new connections

N-1....confirm

In Direct point to point communication adding the Nth computer requires _____ new connections.

N2
N-1
 $N2 - N/2$
None of the given

17. _____ uses counter rotating rings in which data flows in opposite directions

FDDI....confirm

FDDI uses counter rotating rings in which data flows in opposite directions.

18. We need packets rather than bits because _____.

Sender and receiver need to coordinate to detect transmission errors.

Network systems divide data in small blocks or junks called packets, which they send individually. Why we need packets rather than bits? The answer to this question is because a sender and receiver need to coordinate to detect transmission errors. Also the individual connection between each pair of computers is not possible. That's why to

19. The gigabit Ethernet hardware operates at a rate of _____.

1000 Mbps.....confirm

The Gigabit Ethernet hardware operates at a rate of _____

10 Mbps
100 Mbps
1000 Mbps

20. Each computer in LAN is identified by a Physical address usually imprinted on the _____.

Network interface card.....confirm

37. Each computer on LAN is identified by a physical address, usually imprinted on the-----

- a. Modem
- b. Router
- c. Switch
- d. Network interface card

21. _____ network does not depend on CSMA/CD.

Ethernet....confirm

_____ Network (Raise For Success) does not depend on CSMA/CD.

- Ethernet Correct
- Fast Ethernet
- Gigabit Ethernet
- Wireless

22. LAN interface hardware obeys _____ access rule.

CSMA/CD....confirm

- It may use DMA to copy frame data directly from main memory.
- It obeys access rules (e.g., CSMA/CD) when transmitting.
- It checks error detection codes on incoming frames.

23. Point-to-point topology is

Connectivity based....confirm

24. Parity check is usually used to detect _____ bit error(s).

1....confirm

To detect the error there are different schemes in which parity checking is also only used. In parity checking, parity refers to the number of bits set to 1 in the data

25. _____ is a tool that sends a message to a remote computer and reports whether the computer responsibility

Ping...confirm

----- Program sends a message to a remote computer and reports whether the computer responds.

Ping

Ping

Traceroute

ICMP

26. LAN and WAN are classified according to their _____.

Size....confirm

27. LAN and WAN are classified according to their:

- Size✓
- Connectivity
- Medium
- Mobility

27. In a ping command result, time denotes the _____.

RTT....confirm

43. In a ping command result, time denotes the -----

- a. TLT
- b. TTL
- c. BRT
- d. RTT

28. How many computers are mandatory to form a network?

2

The correct answer is 2. A computer network is an interconnection among **two or more** computers or computing devices. Such interconnection allows computers to share data and

29. In __ technique data is treated as a sequence of integers and their arithmetic sum is computed and the carry bits are added to the final sum

Checksum....confirm

CHECKSUM

The second procedure used to detect errors is checksum. In this procedure data is treated as a sequence of integers and their arithmetic sum is computed and the carry bits are added to the final sum. Then checksum is calculated by transmission then it is sent

30. In token ring, if all computers are ready to transmit it enforces _____ access.
Round-robin access.....confirm

software must regenerate token if lost. Token gives computer permission to transmit. If all computers are ready to transmit it enforces Round-Robin access. When a computer is ready to transmit token circulates around ring

31. Fixed network is a type of networks which is classified with respect to the _____ factor.
Mobility....confirm

The networks are also classified according to their mobility. In this respect there are two types of networks.

- Fixed networks
- Mobile networks

In these days mobile networks are the best ones. Mobile networks

32. _____ are two standard implementations to improve computational efficiency
Hashing and direct indexing...confirm

There are two standard implementations to improve computational efficiency:

- Hashing
- Direct indexing

33. In the IP address _____ identifies an individual computer on the network.
Suffix....confirm

SUFFIX:

It identifies an individual computer on the network.

34. In the IP address _____ identifies the physical network to which the computers are attached.

Prefix....confirm

PREFIX:

It identifies the physical network to which the computers are attached.

35. _____ Serve same purpose in internet as frames on LAN.

Packets.....confirm

These packets serve same purpose in Internet as frames on LAN. |

36. IP datagram can contains ____ octets.

1-65.535...confirm

between 1 octet and 65,535 octets (2¹⁶-1).

37. TCP/IP defines the term _____ to refer any computer system that connects to a network and runs applications for users.

Host computer....confirm

TCP/IP defines the term host computer to refer to any computer system that connects to an Internet and runs applications. A TCP/IP protocol makes it possible for

38. _____ protocols of TCP/IP layering model specify how to organize data into frame and how a computer transmits frames over a network.

Network interface layer....confirm

2. _ protocols of TCP/IP layering model specify how to organize data into frame and how a computer transmits frames over a network.

a) Session

b) Network interface layer

c) Internet Layer

d) Transport Layer

39. _____ of TCP/IP protocol suit specifies the format of packets sent across internet as well as the mechanisms used to forward packets.

Internet....confirm

12. _ of TCP/IP Protocol Suit specifies the format of **packets sent across** Internet as well as the mechanisms used to forward packets.

- a) Physical Layer
- b) Data Link Layer
- c) Internet Layer**
- d) Transport Layer

40. As the internet grew the original Classful addressing scheme became a limitation. The IP address space was being exhausted because all networks had to choose one of _____ possible sizes.

Three....confirm

As the **Internet** grew, the original Classful addressing scheme became a limitation. The IP address space was being exhausted because all networks had to choose one of **three possible sizes**. Many addresses were unused.

41. Dotted decimal notation is a syntactic form the IP software uses to express _____ binary values when interacting with humans.

32-bit....confirm

Dotted decimal notation is a syntactic form the IP software uses to express 32-bit binary values when interacting with humans. Dotted decimal represents each octet in

42. Header contains all information needed to deliver datagram to the destination computer. But which one of the following is not included.

Rectfer.....confirm

Header contains all information needed to deliver datagram to the destination computer. It contains:

- Destination address
- Source address
- Identifier
- Other delivery information

43. For _____ information about forwarding is stored in a routing table which is initialized at system initialization and must be updated as network topology changes.

Efficiency.....confirm

For efficiency, information **about forwarding** is stored in a routing table, which is initialized at system initialization and must be updated as network topology changes.

44. MTU stands for _____.

Maximum transmission Unit.....confirm

Maximum Transmission Unit (MTU).

45. In closed-form computation the protocol address assigned to a computer is chosen carefully so that computer's hardware address can be computed from the protocol address using basic Boolean and _____ operations.

Arithmetic....confirm

In Closed-form computation, the protocol address assigned to a computer is chosen carefully so that computer's hardware address can be computed from the protocol address using basic Boolean and arithmetic operations.

46. Internet Protocol (IP) address version 4 is comprised of _____ bits.

32...confirm

8. Internet protocol (IP) address version 4 is comprised of _____ bits.
a) 48
b) 32
c) 24
d) 128

47. The current version of IP-Version 4 is _____ old.

20....confirm

The current version of IP- Version 4 (IPV4) is 20 years old.

48. _____ contains all information needed to deliver datagram to the destination.

Header...confirm

Header contains all information needed to deliver datagram to the destination computer. It contains:

49. Address resolution protocol is mostly used to bind a 32-bit IP address to a _____ Ethernet address.

48....confirm

protocol and hardware addresses. ARP is almost always used to bind a 32-bit IP address to a 48-bit Ethernet address.

50. The protocol address of the most hop must be _____ to an equivalent hardware before a packet can be sent.

Translated....confirm

hardware does not know how to locate a computer from its protocol address. The protocol address of the next hop must be translated to an equivalent hardware address before a packet can be sent.

51. HEADER LEN field gives size of extension header.

True....confirm

HEADER LEN field gives size of extension header.

52. Class A mask is 255.0.0.0 which is used for _____.

Subnetting....confirm

Class A mask is 255.0.0.0 which is used for subnetting.

53. IPV6 address consists of _____.

128 bits....confirm

IPV6 addresses are 128 bits.

54. The header format of IPV6 is entirely different.

True....confirm

IPV6 addresses are 128 bits.
Header format is entirely different.

55. HLEN shows the header length in units of _____ bits.

32 bits...confirm

HLEN shows the header length in units of 32-bits.

56. VERS shows the version of _____.

IP.....confirm

VERS shows the version of IP.

57. TOTAL LENGTH shows total octets in _____.

Datagram...confirm

TOTAL LENGTH shows total octets in datagram.

58. A datagram cannot be larger than _____ of a network over which it is sent.

MTU...confirm

A datagram cannot be larger than _____ of a network over which it is sent.
Select correct option:

MTU

Size

59. Every hardware technology specification includes the definition of the maximum size of the frame data area which is called the _____ transmission Unit.

Maximum.....confirm

Every hardware technology specification includes the definition of the maximum size of the frame data area, which is called the Maximum Transmission Unit (MTU). Any

60. The IP class scheme does not divide the _____ address space into equal size class and the classes do not contain the same number of networks.

32-bit....confirm

The IP class scheme does not divide the 32-bit address space into equal size class and the classes do not contain the same number of networks.

61. _____ shows senders preference for low latency high reliability.

Service type....confrim

SERVICE TYPE shows sender's preference for low latency, high reliability

62. NEXT HEADER field in the base header defines type of header if appears at the end of fixed-size base header.

True.....confirm

Base header is fixed size i.e. 40 octets. NEXT HEADER field in the base header defines **type of header** and it appears at end of fixed-size base header. Some extension

63. _____ uses counter rotating rings in which data flows in opposite directions.

FDDI....confirm

FDDI uses counter **rotating rings** in which data flows in opposite directions.

64. In _____ all computers are attached to a central hub.

Star topology....confirm

STAR TOPOLOGY:

In this topology, **all computers are attached** to a central point,

65. In a ____ all computers are attached to a single cable and any computer can send data to any other computer.

Bus topology....confirm

In a bus topology **all computers are attached** to a single long cable and any computer can send data to any other computer.

66. _____ is standard wireless LAN that uses radio signals at 2.4GHz.

IEEE 802.11.....confirm

IEEE 802.11 is standard wireless LAN that **uses radio** signals at 2.4GHz.

67. Star topology is the kind of _____.

Point to point topology.....confirm

In *Point-to-Point* topology there are two topologies.

- 1) **STAR topology**
- 2) TREE topology

68. Tree topology is the kind of _.

Point to point topology....confirm

In *Point-to-Point* topology there are two topologies.

- 1) **STAR topology**
- 2) **TREE topology**

69. In FDDI, in case of a station failure, remaining stations loop back and _____.

Re-route data through spare ring.....confirm

In case of fiber a station failure, remaining stations **loop back and** reroute data through spare ring. In this way all stations automatically configure loop back by monitoring data

70. _____ are the two frame types

Multicast and broadcast....confrim

_____ and _____ are the two **frame types**.

- Internal and external
- Single and dual
- Implicit and explicit
- **Multicast and broadcast** page 35

71. In ____ topology if the switch goes down all the computers will be disconnected.

Star....confirm

In _____ topology, if the switch **goes down** all the computers will be disconnected.

- **Star**
- Ring
- Bus
- Mesh

72. Which type of network consists of wireless connection of laptops in a university classroom?

LAN....confirm

Which type of network **consists of wireless** connection of laptops in a university classroom?

- WAN
- MAN
- Fog
- **LAN** google

73. The basic idea behind the operation of network analyzer is a computer with a network interface that receives all frames, which is called

Promiscuous mode.....confirm

The **basic idea** behind the operation of network analyzer is a computer with a network interface that receives all frames, which is called promiscuous mode.

74. WE need packets rather than bits because_____.

a sender and receiver need to coordinate to detect transmission errors...confirm

send individually. Why we need **packets rather** than bits? The answer to this question is because a sender and receiver need to coordinate to detect transmission errors. Also the

75. As a result of ARPA research, the first network was established which was named as _____.

ARPANET.....confirm

fulfill the purpose of resource sharing. As a result of **ARPA** research the first network was established which was named **ARPANET**.

76. While transmitting data from source destination B, 4 bits are changed during the transmission then the error is a _____.

Burst error....confirm

While transmitting data from source A to destination B, 4 bits are changed during the transmission then the error is a _____.

- Burst error page 22
- Single error
- Double error
- Logic error

77. Each computer in LAN is identified by a physical address, usually imprinted on the _____.

Network interface card....confirm

Each computer on LAN is identified by a physical address, usually imprinted on the-----

Modem
Router
Switch

Network interface card

78. Which type of network consists of wired computers in a university classroom?

LAN....confirm

Which type of network consists of wired computers in a college classroom?

PAN

LAN

MAN

79. Bluetooth uses shared medium and _____ instead of coaxial cable.

Radio waves....confirm

Bluetooth specifies a wireless LAN for short distances. It uses shared medium and radio waves instead of coaxial cable.

80. The Ethernet standard specifies that frames are sent using the _____ scheme.

Manchester Encoding.....confirm

The Ethernet standard specifies that frames are sent using the -----

Select correct option:

- Differential Manchester
- Not Return to Zero (NRZ)
- Manchester Encoding (Correct)
- Return to Zero (RZ)

81. In _____ technique, all members of the network can send data on the specific time slot?

CSMA....confirm

In _____ technique, all members of the network can send data only on the specific time slot?

- CDMA
- FDMA
- CSMA page 43
- TDMA

82. A network uses _____ to arrange computers in a single closed loop

Ring topology....confirm

A network uses _____ to arrange computers in a single closed loop.

- Star Topology
- Mesh Topology
- **Ring Topology** page 25
- Bus Topology

83. NICs can provide all three-connection technologies.

RJ-45 connector for 10 base-T, AUI connector for thicknet and BNC connector for Thinnet.....confirm

Question # 7 of 10 (Start time: 10:37:07 PM) Total Marks: 1

NICs can provide all three-connection technologies

Select correct option:

RJ-45 Connector for 10Base-T, AUI Connector for Thicknet and BNC Connector for Thinnet ok

RJ-45 Connector for Thicknet, AUI Connector for 10Base-T and BNC Connector for Thinnet

84. Computer networks are classified by _____ factors.

4...confirm

Computer networks are classified by four factors which are as follow:

- 1) BY SIZE:
- 2) BY CONNECTIVITY:
- 3) BY MEDIUM:
- 4) BY MOBILITY:

85. _____ is also called self healing network.

FDDI....confirm

----- is also called **self healing network**

Select correct option:

ATM
FDDI

86. _____ was the first automated tool required to see whether the given computer is online or not.

PING program....confirm

Now an **automated tool** is required that tests to see whether the given computer is online or not. For this purpose the first tool is the '**PING program**' which is shown in the figure below.

87. Ethernet uses a _____ bit static addressing scheme in which device is assigned a unique address by the manufacturer.

48....confirm

Ethernet uses a _____ **static addressing scheme in which each device is assigned a unique address by the manufacturer.**

- 64
- **48**
- 32
- 8

88. _____ is designed to detect transmission errors, send one extra bit of information with each character.

Parity....confirm

----- scheme, which is designed to help detect transmissions **errors, send one extra bit of information with each character**

- **Parity**
- Checksums

89. Hardware addresses must be _____ on a LAN.

Unique....confirm

Hardware addresses must be ----- on a LAN.

Unique PG:34
Common

90. The Fast Ethernet hardware operates at a rate of _____.

100 Mbps.....confirm

the **fast** Ethernet operates at 100Mbps. 1

91. Inside a computer each address mask is stored as a _____ bit value.

32.....confirm

Inside a computer, each address mask is stored as a 32-bit value.

92. The protocol address of the next hop must be ----- to an equivalent hardware address before a packet can be sent.

Translated....confirm

hardware does not know how to locate a computer from its protocol address. The protocol address of the next hop must be translated to an equivalent hardware address before a packet can be sent.

93. _____ protocols of TCP/IP layering model specify how to ensure reliable transfer.

Transport layer....confirm

_____ protocols of TCP/IP layering model specify how to ensure reliable transfer.
Ad closed by Google

- Physical Layer
- Network Interface Layer
- Internet Layer
- Transport Layer

94. _____ are two standard implementations to improve computational efficiency.

Hashing and direct indexing....confirm

Figure 27.2

There are two standard implementations to improve computational efficiency:

- Hashing
- Direct indexing

95. _____ of TCP/IP protocol suit defines the basic characteristics of network hardware.

Physical layer....confirm

14. _ of TCP/IP protocol suit defines the basic characteristics of network hardware.

a) Physical Layer

b) Data Link Layer

96. Dotted decimal represents each octet in _____ and uses a dot to separate octets.

Decimal...confirm

binary values when interacting with humans. Dotted decimal represents each octet in decimal and uses a dot to separate octets. This is shown in the figure below.

97. In closed-form computation the protocol address assigned to a computer is chosen carefully so that computer's hardware address can be computed from the protocol address using basic Boolean and _____ operations.

Arithmetic...confirm

In Closed-form computation, the protocol address assigned to a computer is chosen carefully so that computer's hardware address can be computed from the protocol address using basic Boolean and arithmetic operations.

98. Address Resolution Protocol is mostly used to bind a 32-bit IP address to a _____ Ethernet address.

48-bit...confirm

protocol and hardware addresses. ARP is almost always used to bind a 32-bit IP address to a 48-bit Ethernet address.

99. A separate _____ table is used for each physical network.

Address-binding...confirm

separate address-binding table is used for each physical network.

100. The ethernet speed was originally _____.

3MBps.....confirm

101. The current standard is _____.

10Mbps....confirm

102. _____ Source is responsible for fragmentation.

a. IPV6.....confirm

103. Which of the following statement is true regarding ATM?

a. It is a single technology for voice, video and data.

b. It has low jitter and high capacity.

c. It uses fixed size, small cells, 48 octet's data.

d. All of the above

104. As a result of ARPA research, the first network was established which was named as _____.

a. ARPANET.....confrim

fulfill the purpose of resource sharing. As a result of ARPA research the first network was established which was named ARPANET.

105. _____ protocol uses three way handshake to begin a connection.

a. TCP.....confirm

THREE-WAY HANDSHAKE TO BEGIN A CONNECTION:

Part of the 3-way handshake used to create a connection, requires each end to generate a random 32-bit sequence number. If an application attempts to establish a new TCP connection after a computer reboots, TCP chooses a new random number.

106. NAT device stores state information in translation table.

False...confirm

NAT device stores state information in table.

107. NAT device stores state information in table

True...confirm

NAT device stores state information in table.

108. The number of connections needed for 8 computers in direct point to point communication is equal to _____.

28....confirm

The number of connections needed for 8 computers indirect point to point communications is equal is(CS610)

7
26
8
28

109. The bridges communicate with each other on the network and use _____ algorithm to decide which bridge will not forward frames if a cycle occurs.

Distributed Spanning Tree.....confirm

The bridges communicate with each other on the network and use Distributed Spanning Tree (DST) algorithm to decide which bridge will not forward frames if a cycle occurs.

110. _____ places the boundary between the second and third octets.

Class B....confirm

Question No: 8 (Marks: 1) - Please choose one
_____ places the boundary between the second and third octets

- ▶ Class A
- ▶ Class B

111. _____ cannot be extended arbitrarily far or to handle arbitrarily many computers.

LAN.....confirm

18. _____ **cannot be** extended arbitrarily far or to handle arbitrarily many computers.

1. WAN
2. **LAN**

112. _____ encapsulates IP datagram as data area in hardware frame.

Network Interface Layer....confirm

Network interface layer encapsulates IP datagram **as data area** in hardware frame.

Hardware ignores IP datagram format. Standards for encapsulation describe details.

113. _____ is standard wireless LAN that uses radio signals at 2.4GHz.

IEEE 802.11.....confirm

IEEE 802.11 is standard wireless LAN that uses radio signals at 2.4GHz. I

114. Missing _____ in a frame format indicates receiving computer missed beginning of the message.

Soh.....confirm

Missing soh indicates receiving computer **missed** beginning of message.

115. Missing _____ indicates sending computer crashed.

Eot....confirm

Missing eot indicates sending computer crashed.

116. An interior switch is one with wich _____..

No computer is attached.....confirm

64. An interior switch **is one with** wich _____.

1. Computers are attached.
2. **No computer is attached.**

117. VBR stands for _____.

Variable Bit Rate....confirm

VARIABLE BIT RATE (VBR):

118. ABR stands for _____.

Available Bit rate....confirm

AVAILABLE BIT RATE (ABR):

119. CBR stands for _____.

Constant Bit rate....confirm

CONSTANT BIT RATE (CBR):

120. If simultaneous transmission occurs, the frames interfere with each other and this phenomenon is called _____.

Collision.....confirm

If **simultaneous** transmission occurs, the frames interfere with each other and this phenomenon is called collision.

121. The first automated tool required to see whether the given computer is online or not was

PING program.....confirm

internet.

Now an automated tool is required that tests **to see whether the given computer is online or not.**
For this purpose the first tool is the 'PING program' which is shown in the figure below.

122. The recent executed instruction _____ in temporal aspect of the locality of reference.

is temporarily not referenced

3. The **temporal** aspect of the locality of reference means _____
- a) That the recently executed instruction won't be executed soon
 - b) That the recently executed instruction is temporarily not referenced
 - c) That the recently executed instruction will be executed soon again
 - d) None of the mentioned

[View Answer](#)

Answer: c
Explanation: None.

123. The _____ of errors is easier than the _____ of errors.

correction, detection

23. The _____ of errors is **easier** than the _____ of errors.

1. **correction, detection**

124. ATM header is about _____ of the cell.

10 %

21. **ATM header** is about _____ of the cell.

1. 100 %

2. **10 %**

125. Hardware that calculates a CRC uses two simple components _____.

Shift register and XOR unit....confirm

CRC uses just two hardware components:

- Shift register
- Exclusive OR (XOR unit)

126. _____ is inflexible.

Static routing....confirm

127. Frames include additional information to detect/correct errors are insert by _____.

Sender and Receiver...confirm

128. Fragmentation when using ICMP for path MTU should be avoided.

True...confirm

129. The frame format of any LAN technology must consists of _____ and _____.

Frame header and pay load.....confirm

LAN technology standards define frame format for each technology. All contemporary standards use the following general format.
a) Frame header b) payload

130. SMDS(Switched Multi megabit Data Service) is _____.

Connection less service....confirm

131. Which of the following is not a guided medium?

Atmosphere

132. _____ are more frequently being designed to allow specification of the quality of service required by users.

Networks....confirm

133. The physical addressing in a WAN is similar as in LAN in the way _____.

- a. The data is transmitted in packets equivalent to frames.
- b. Each packet has a format with header.
- c. The packet header includes destination and source addresses.
- d. All of the above

134. Two computers with a connection through an ATM network will likely have same VPI/VCI values for each end of the connection.

True....confirm

135. NIC connection in a physical network is known as _____.

LAN wiring scheme.....confirm

136. A _____ is a special-purpose computer dedicated to the task of interconnecting networks.

Router....confirm

137. The third field of the header consists of _____ bit Ethernet frame type.

16

138. _____ is the most popular wiring scheme because of lowest cost.

10 Base T....confirm

139. To span long distances or many computers, networks must replace shared medium with _____.

packet switches....confirm

140. Frame relay is _____.

Connection oriented service....confirm

141. Which multiplexing technique transmits analog signals?

- a. FDM
- b. TDM
- c. WDM

d. Both (a) and (c)....confirm

142. Which of the following is not a benefit of Source Independence?

- a. It allows fast and efficient routing.
- b. Packet switch need not have complete information about all destinations.
- c. network functions even if topology changes.

d. None of the given.....confirm

COMPUTER NETWORKS

(CS610)

HANDOUTS

LECTURERS # 01 – 45

PREPARED BY:

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Lecture No. 10

FRAME TYPE IDENTIFICATION

There are some problems with the broadcast. For every broadcast frame on the network each computer uses computational resources and places the contents into memory, which interrupt the CPU. It allows system software to make the decision whether to discard or use the frames.

Another problem is that if a pair of computer use broadcasting instead of sending them directly all other computers waste CPU time while discarding the frames.

MULTICASTING:

The solution to above problem is multicasting. It is the restricted form of broadcasting. It works like broadcasting however it does not forward frames automatically to the CPU.

The interface hardware is programmed in advance to accept certain frames that have multicast address as the destination address.

If an application program wishes to receive certain frames then it program the interface hardware to accept an additional set of addresses.

The interface hardware frame then begins accepting three types of frames:

- Multicast frames
- Broadcast frames
- The frames that are destined to the station itself.

MULTICAST ADDRESSING:

We take an example of computers running an audio application. We see that they can receive audio frames if the interface are programmed to received them and the other computers that are not running that audio application will not waste resources

IDENTIFYING PACKET CONTENTS:

The destination must get some clue about how to interpret frame data. For this purpose it can use two types which are given as follows.

EXPLICIT FRAME TYPE:

In this type the identifying value is included with frame describes types of included data.

IMPLICIT FRAME TYPE:

In implicit frame the receiver must infer from frame data.

HEADERS AND FRAME FORMAT:

LAN technology standards define frame format for each technology. All contemporary standards use the following general format.

- a) Frame header b) payload

Frame header has address and other identifying information. Information typically in fields has fixed size and location. The data area may vary in size.

The Ethernet frame format is shown in the figure.

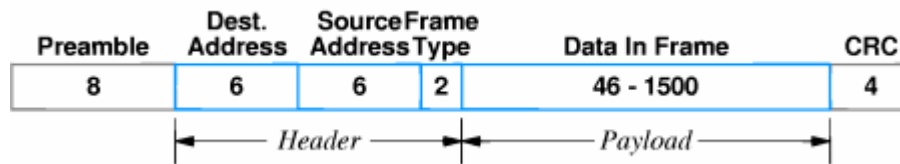


Figure 10.1 the Ethernet frame format

The different fields of ether frame format and their purposes is explained below:

<u>FIELD</u>	<u>PURPOSE</u>
Preamble	Receiver synchronization
Destination Address	Identifies intended receiver
Source Address	Hardware address of sender
Frame Type	Type of data carried in frame
Data	Frame payload
CRC	32-bit CRC code

ETHERNET FIELDS:

In Ethernet fields the preamble and CRC is often not shown in frame. The destination address of all is the broadcast address. There is special value reserved for frame type field.

FRAME WITHOUT TYPE FIELDS:

Some LAN technologies do not include a type field.

Sender and receiver can agree on interpretation, which is as follows:

They agree on single data format and use only that format this limits to one type of data. In this way all computers on LAN must use one format. Also they agree to encode the data format into first few bytes of the data field.

ENCODING THE DATA TYPE:

The figure illustrates a frame in which the data type is specified by using the data area.

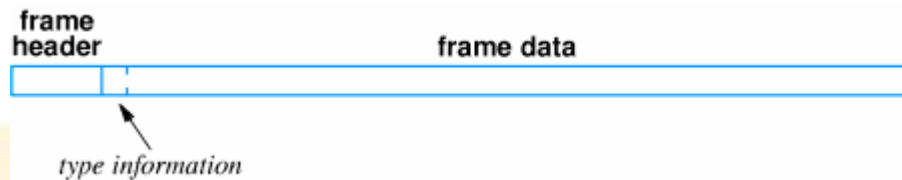


Figure 10.2. Encoding the data type

To ensure interoperability format of encoding area must be universally agreed upon it typically set by standards only.

IEEE 802.2 LLC:

IEEE 802.2 standard includes logical link control (LLC) sub network attachment point (SNAP) header. SNAP/LLC format is widely used for example by Ethernet. This is shown in figure below:

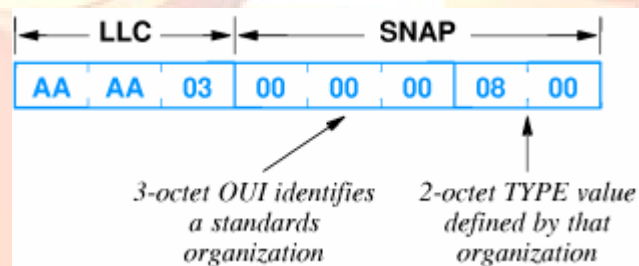


Figure 10.3. SNAP/LLC format

In the figure LLC portion indicates SNAP field to follow OUI (organizationally unique identifier) identifies Ethernet specification organization.

Also the type field is interpreted as in Ethernet (in this case, IP) as shown in figure above.

UNKNOWN TYPES:

For either encoding format some computer may not be prepared to accept frames of some types, which are unknown e.g. protocol type is not installed and the newly defined type.

The receiving computer examines the field and discards any frame with unknown type.

NETWORK ANALYZERS:

A network analyzer also called network monitor or a network sniffer is used to examine the performance of or debug a network.

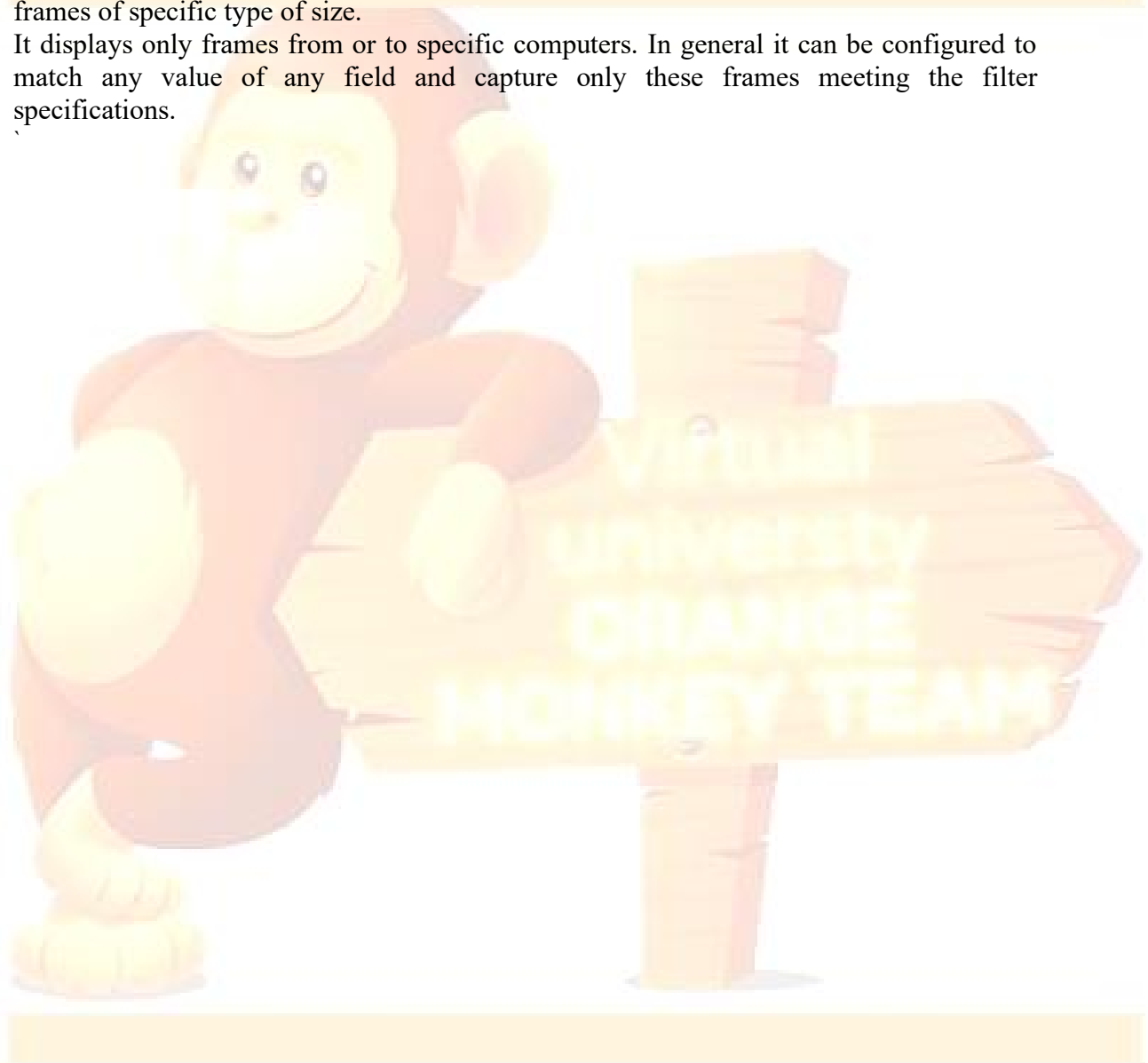
It can report statistics such as capacity utilization, distribution of frame size, collision rate or token circulation time.

OPERATION OF NETWORK ANALYZERS:

The basic idea behind the operation of network analyzer is a computer with a network interface that receives all frames, which is called promiscuous mode. Many desktop computers have interface that can be configured for promiscuous mode. When combined with software computer can examine any frame on LAN. In this way the communication across LAN is guaranteed to be private. This computer receives and displays (but does not respond to) frames on the LAN.

Network analyzer can be configured to filter and process frames. It can count frames of specific type of size.

It displays only frames from or to specific computers. In general it can be configured to match any value of any field and capture only these frames meeting the filter specifications.



Lecture No. 11

INTERFACE HARDWARE

LAN data transmission speeds are typically fast relative to CPU speeds. LANs speeds are defined independent of any specific processor speeds, which allows for mix of any attached systems. In this way new computers can be attached without affecting LAN speeds.

NETWORK INTERFACE HARDWARE:

CPU can't process data at network speeds. So in order to connect to the network computer systems use special purpose hardware for network connections which consists of typically a separate card in the back plane which is called Network Adapter Card or Network Interface Card (NIC).

The connector on NIC at the back of computer then accepts cable to physical network. The CPU structure is shown in the figure.

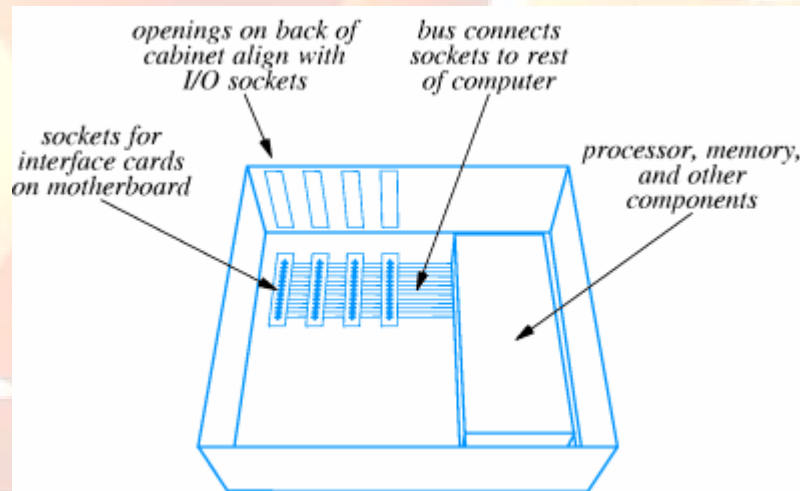


Figure 11.1

The Network Connector is also shown in the figure below.

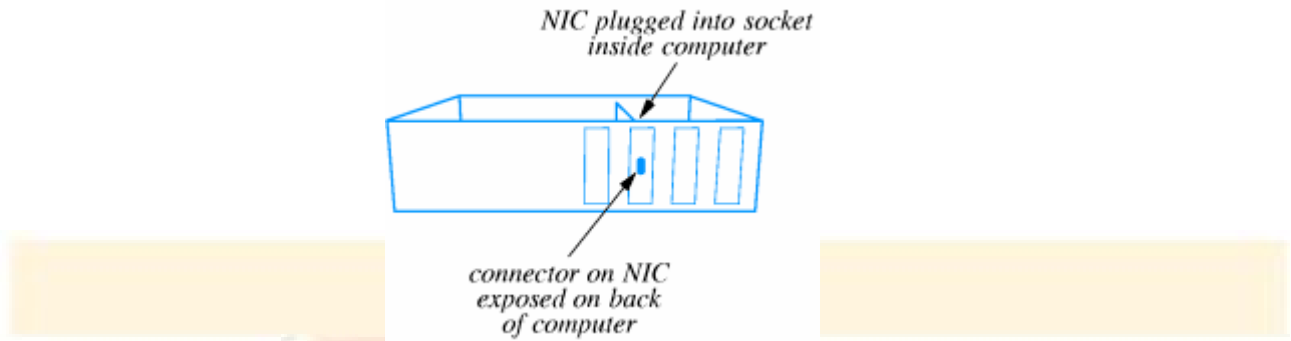


Figure 11.2

NICs AND NETWORK HARDWARE:

NIC is built for one kind of physical network. For example Ethernet interface can not be used with token ring and similarly ATM interface cannot be used with FDDI.

Some NICs can be used with different but similar hardware for example thick, thin and 10 Base-T Ethernet, 10Mbps and 100Mbps Ethernet.

NIC AND CPU PROCESSING:

NIC contains sufficient hardware to process data independent of system CPU. In which some NICs contain separate microprocessor. In addition to this it also include analog circuitry interface to system bus, buffering and processing.

NIC looks like any other I/O device to system CPU. The system CPU forms message request and sends instructions to NIC to transmit data. NIC also receives interrupt on incoming data.

CONNECTION BETWEEN NIC AND PHYSICAL NETWORK:

TWO ALTERNATIVES:

NIC contains all circuitry and connects directly to network medium. A cable from NIC connects to additional circuitry that then attaches to the network medium.

THIN ETHERNET VERSUS 10BASE-T:

Thin Ethernet and 10Base-T are both Ethernet. The network technology is not limited to one style of connection.

THICK ETHERNET WIRING:

It uses thick coax cable. AUI cable (or transceiver or drop cable) connects from NIC to transceiver. AUI cable carries digital signal from NIC to transceiver. The transceiver generates analog signal on coax cable. The wires in AUI carry digital signals power and other control signals. Thick Ethernet also requires terminators to avoid signal reflectance. This is shown in the figure below:

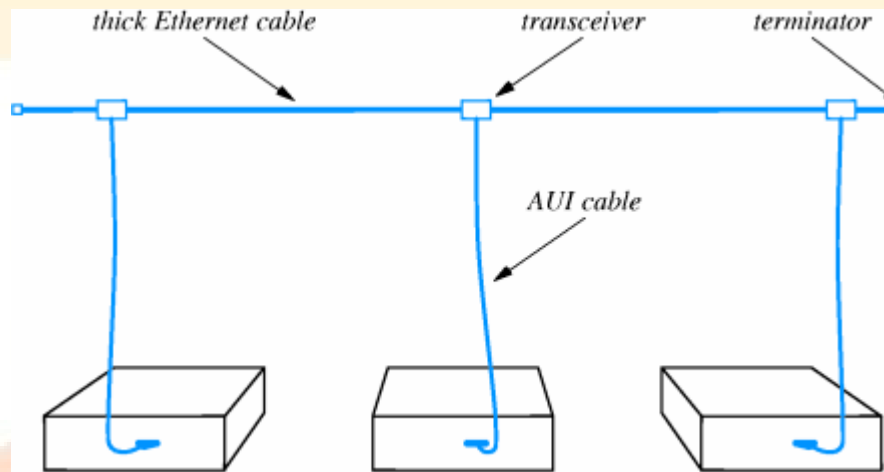


Figure 11.3

CONNECTION MULTIPLEXING:

In some circumstances transceiver may be in convenient e.g. workstations in a LAN. Connection multiplexer connects multiple computers to a single transceiver. Each computer's AUI cable connects to connection multiplexer. One AUI from multiplexer to Ethernet coax. Connection multiplexing is shown in the figure below.

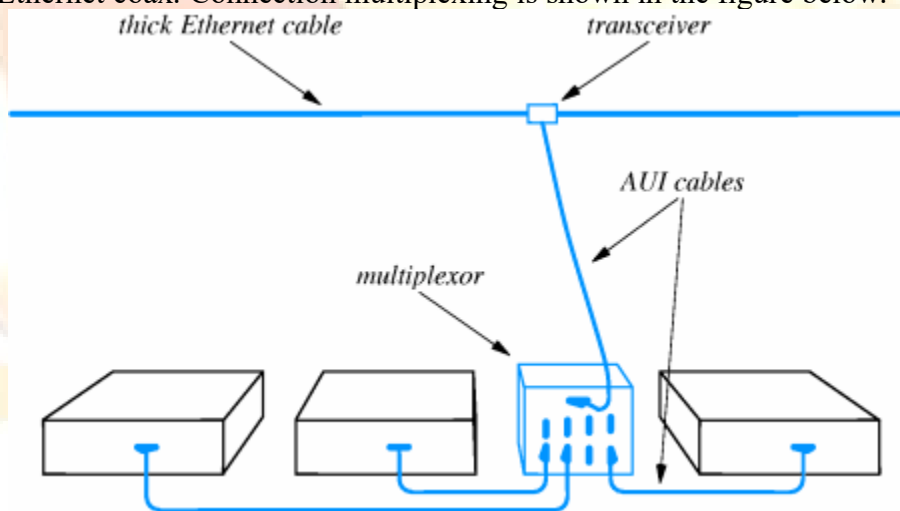


Figure 11.4

THIN ETHERNET WIRING:

Thin Ethernet uses thin coax cable that is cheaper and easier to install than thick Ethernet coax. In this case transceiver electronics are built into NIC and NIC connects directly to network medium.

Coax cable use BNC connector on NIC. Coax runs directly to back of each connected computer by T-connector. The T-connector directly attaches to NIC. This is shown in the figure below.

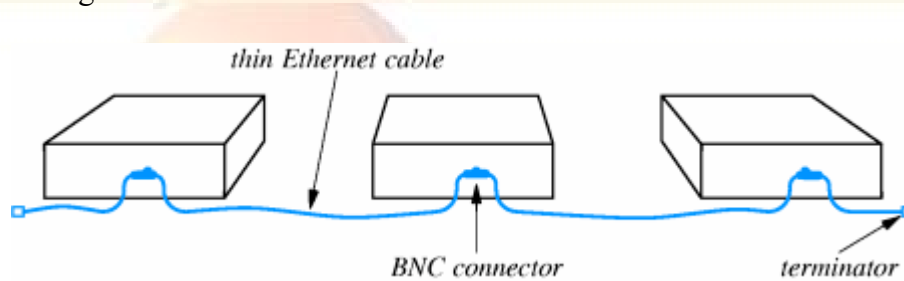
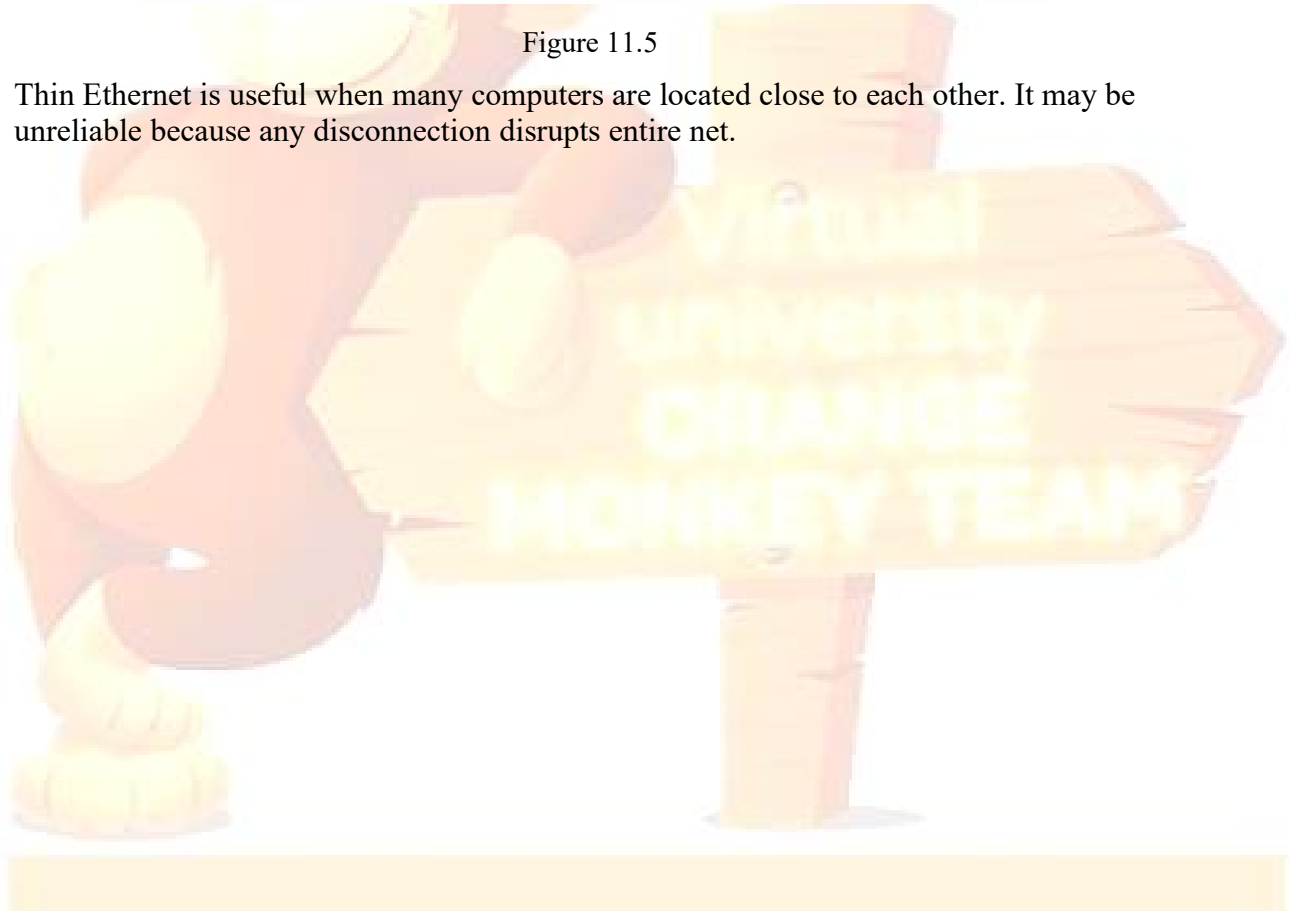


Figure 11.5

Thin Ethernet is useful when many computers are located close to each other. It may be unreliable because any disconnection disrupts entire net.



Lecture No. 12

LAN WIRING AND PHYSICAL TOPOLOGY

10BASE-T:

This is another standard of wiring scheme. It is commonly called 10Base-T, Twisted Pair or TP Ethernet. It replaces AUI cable with twisted pair cable and thick coax with hub.

This makes it cheaper and that's why it is most useful technology of today. It is shown in the figure below:

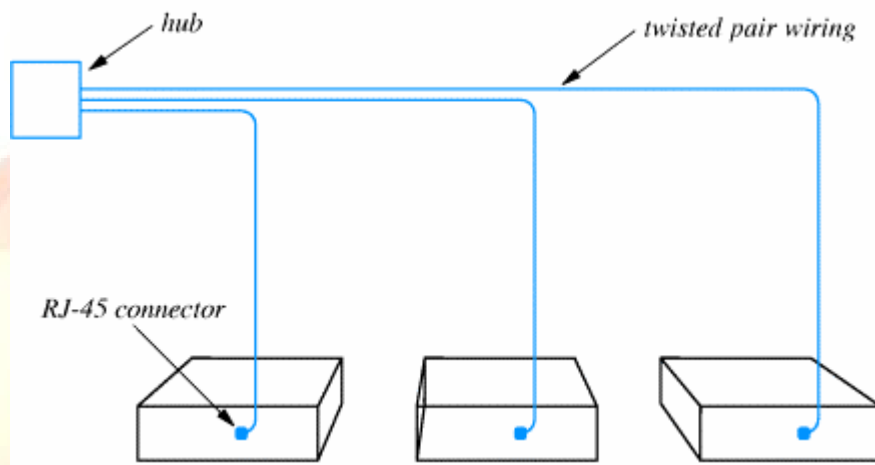


Figure12.1

HUBS:

They are used for extension of connection with multiplexing concept. They are sometimes called Ethernet-in-a-box. It is effectively a very short Ethernet with very long AUI cables. It can be connected into larger Ethernet.

PROTOCOL SOFTWARE AND ETHERNET WIRING:

All wiring technologies use identical Ethernet specifications. e.g. they use same frame format. They use same CSMA/CD algorithms. They can mix different technologies in an Ethernet.

NICs can provide all three-connection technologies. The protocol software can't differentiate among wiring technologies. The NIC is shown in the figure below with three connectors.

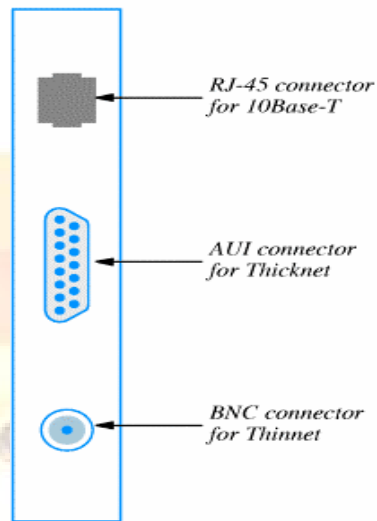


Figure 12.2

COMPARISON OF WIRING SCHEME:

The wiring schemes are compared as follows:

Separate transceiver allows computers to be powered off or disconnected from network without disrupting other communication.

Transceiver may be located in an inconvenient place, so finely malfunction transceiver can be hard.

In other case, thin coax cable takes minimum of cable. Disconnecting one computer (on one loose connection) can disrupt entire network.

Hub wiring centralizes electronics and connections. It makes management easier. Bottom line 10Base-T is most popular because of lowest cost.

TOPOLOGIES AND NETWORK TECHNOLOGIES:

10Base-T network topology is a bus but wiring topology is a star. The token ring network topology is a ring but wiring topology is a star.

We should remember to distinguish between logical and physical topologies. A topology is logically a star or it is physically a star.

FILTERING INCOMING FRAMES:

An analyzer can be configured to filter and process frames. It can count frames of a specific type or size. It can also display only frames from or to specific computers.

In general, it can be configured to match value of any field and capture only those frames making the filter specification.

ADVANTAGE AND DISADVANTAGE OF WIRING SCHEMES:

Each of three wiring schemes has advantages and disadvantages, which are explained as follows:

RELIABILITY ISSUES:

Wiring that uses a transceiver for each connection does not affect the entire network if a transceiver cable is disconnected. A cable cut occurring in hub wiring only affects one computer.

COST ISSUES:

Twisted pair Ethernet is the cheapest wiring that makes it so popular. Thicknet is the most costly wiring, which is no longer used.

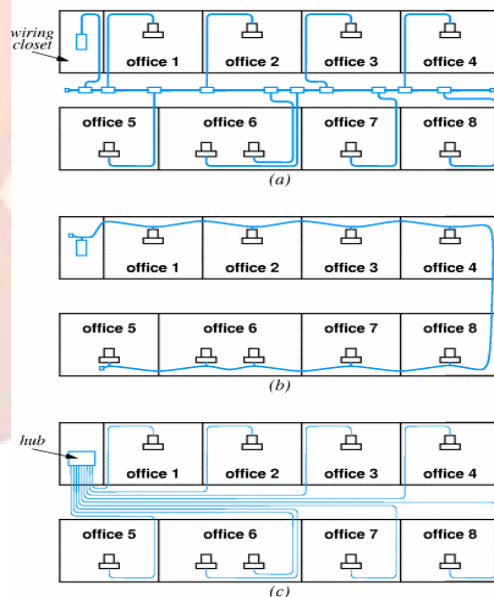


Figure 12.3

As shown in the figure eight offices are wired with

- a) Thick Ethernet b) Thin Ethernet c) Twisted pair Ethernet

We can see that the length of wired varies in three schemes so cost varies in three schemes.

THE TOPOLOGY PARADOX:

The main feature of twisted pair Ethernet is that it forms a classic star topology however functions like a bus. 10Base-T Ethernet is often called a star shaped bus.

Two different types OF TOPOLOGIES:

LOGICAL TOPOLOGY:

It is defined by the specific network technology.

PHYSICAL TOPOLOGY:

It depends on the wiring scheme.

NETWORK INTERFACE CARD AND WIRING SCHEMES:

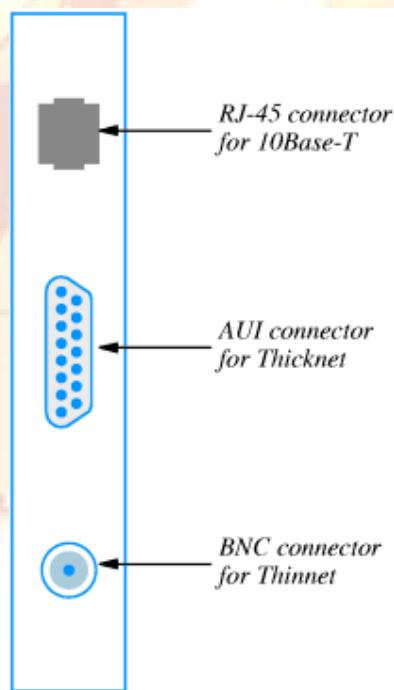


Figure 12.4

To allow changing the wiring without changing the interface hardware, NICs support multiple wiring schemes. it is shown in the figure below.

10/100 NETWORK INTERFACES AND AUTONEGATiation:

10Base-T version of twisted pair Ethernet operated at 10Mbps. 10Base-T Twisted pair Ethernet operates at 100Mbps.

100Base-T technology is backward compatible and allows the participants to negotiate a speed when connection is established. This process is known as auto negotiation.

CATEGORIES OF WIRES:

Cable used for wiring should match the following:

- The intended data rate
- The distance between devices
- The amount of em-noise
- Anticipated future needs
- Cost

Some categories and their typical uses are shown in the figure below.

Category	Bandwidth	Typical Uses
3	16 MHz	older, low-speed networks; analog telephones
4	20 MHz	short distance 10Base-T
5	100 MHz	10Base-T Ethernet; some 100Base-T
5E	100 MHz	100Base-T (Fast Ethernet); some 1000Base-T
6	250 MHz	1000Base-T Gigabit Ethernet) or ATM
7	600 MHz	future (possibly 10 Gigabit Ethernet)

Figure 12.5

WIRING SCHEMES AND OTHER NETWORK TECHNOLOGIES:

Multiple wiring schemes are not limited to Ethernet technology. Almost all-together network technologies use different wiring schemes. e.g., local talk uses hubs (physical star) to simulate a bus topology.

IBM's token ring also uses hubs (physically a star topology) to simulate a logical ring network.

Lecture No. 13

FIBER MODEMS AND REPEATERS

LAN technologies are designed to operate within the same building. However most companies or institutions have offices located far apart from each other.

DISTANCE LIMITATION AND LAN DESIGN:

The maximum cable length of a LAN is fixed because the electrical signal level gets weaker as it travels. The delays must be short to allow access mechanisms (CSMA/CD, token passing) work properly.

However in most cases a LAN needs to be extended larger distances than the maximum Cable length limit.

For example: extending a company LAN to another building.

LAN EXTENSIONS:

Several techniques extend diameter of LAN medium. In this purpose most techniques use additional hardware. LAN signals relayed between LAN segments.

Resulting mixed technology stays within original engineering constraints while spanning greater distance.

FIBER OPTIC EXTENSION:

The LAN extension using fiber optic is shown in the figure below:

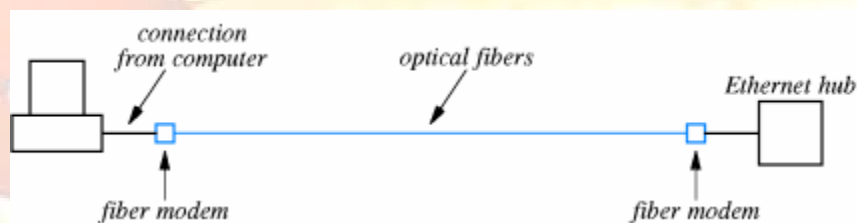


Figure 13.1

The fiber-modem converts digital data into pulses of light then transmits over the optical fiber. It also receives light and converts into digital data.

This mechanism will successfully extend the optical fiber across several kilometers because delays on optical fiber are very low and bandwidth is very high.

REPEATERS:

Repeaters are used when copper wire communication is carried out. According to the fact that electrical signal gets weaker while traveling over copper wires. A repeater is used to increase the signal strength. It amplifies the weakening signal received from one segment and then retransmits onto another segment.

It is shown in the figure below:

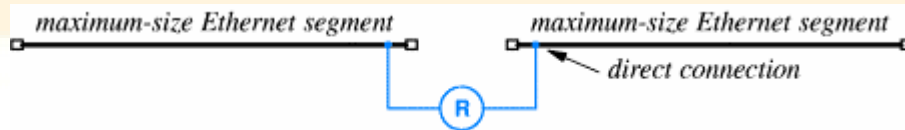


Figure13.2

One repeater doubles, two repeaters triple the maximum cable length limitation.

Computers attached to different segments communicate as if they are connected to the same cable.

It is to be noted that we cannot increase the maximum cable length as many times as we wish by just adding repeaters. The reason for this is that every repeater introduces a delay and the access mechanism such as CSMA/CD does not work with long delays.

Ethernet standard specifies that any two stations cannot be separated by more than four repeaters.

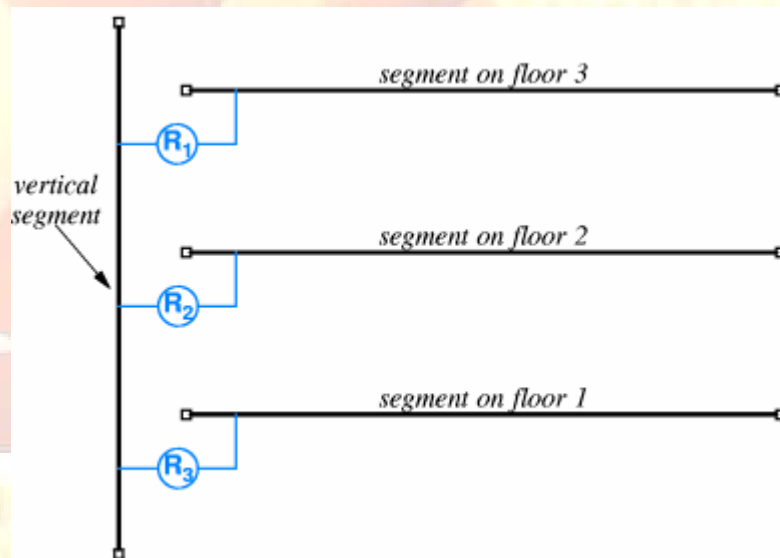


Figure13.3

The figure shows repeaters using the vertical segment. We see that only two repeaters separate any two stations in this scheme.

DISADVANTAGES OF REPEATERS:

Repeaters do not recognize frame formats, they just amplify and retransmit the electrical signal. If a collision or error occurs in one segment, repeaters amplify and retransmit also the error onto the other segments.

BRIDGES:

A bridge is a hardware device also used to connect two LAN segments to extend a LAN. Unlike a repeater, a bridge uses two NICs to connect two segments. It listens to all traffic and recognizes frame format. It also forwards only correct complete frames and discards the collided and error frames.

A typical bridge has two NICs, a CPU a memory and a ROM. It only runs the code stored in its ROM.

FRAME FILTERING:

The most important task a bridge performs is frame filtering. If both the source and destination are on the same segment, it does not forward the frame to the other segment. A frame is forwarded to the other segment, if it is destined to that segment. Broadcast and multicast frames are also forwarded.

A bridge keeps a list for each segment that consists of physical addresses of the computer attached to that segment. In this way a bridge knows on which segment a destination computer is attached.

Most bridges are self learning bridges. As soon as a frame arrives to a bridge, it extracts a source address from its header and automatically adds it in the list for that segment. In this way a bridge builds up address lists. This is shown in the figure below:

Event	Segment 1 List	Segment 2 List
Bridge boots	–	–
U sends to V	U	–
V sends to U	U, V	–
Z broadcasts	U, V	Z
Y sends to V	U, V	Z, Y
Y sends to X	U, V	Z, Y
X sends to W	U, V	Z, Y, X
W sends to Z	U, V, W	Z, Y, X

Figure 13.4

Lecture No. 14

BRIDGES

STARTUP AND STEADY STATE:

When a bridge first boots the address lists are empty (start up state). The bridge forwards frames to the other segment if it can not find its destination address in its lists.

After some time when the bridge has received at least one frame from every computer, it has the lists built (steady state) it forwards frames as far it is necessary.

PLANNING A BRIDGE NETWORK:

In a steady state, a bridge allows simultaneous use of each segment. When designing a LAN, bridges can be installed to divide the LAN into segments to improve performance.

For example:

Frequently contacting computers can be attached to the same segment. The frame traffic on one segment does not affect the other segments.

BRIDGING BETWEEN BUILDINGS:

If two buildings are located far from each other, a bridge, a pair of fiber modems and an optical fiber can be used to connect two LANs as shown in the figure below.

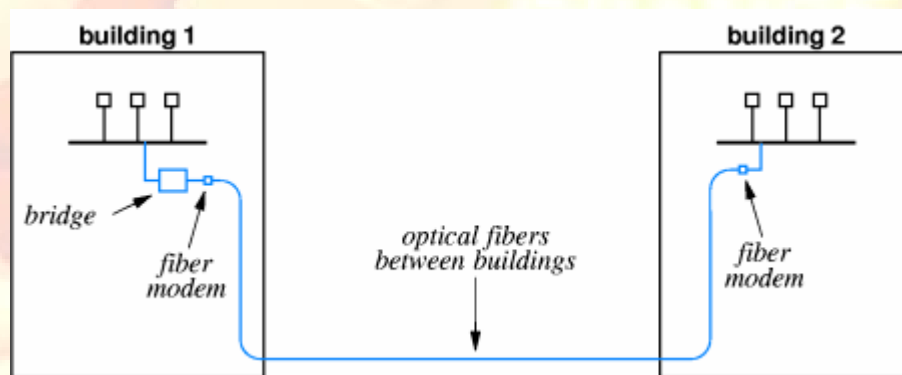


Figure14.1

BRIDGING BETWEEN BUILDINGS:

ADVANTAGES:

COST:

An optical fiber modem pair is sufficient to connect many computers located on separate buildings.

MAINTAINANCE:

There is no need to change the wiring between the buildings when installing and removing a computer.

PERFORMANCE:

The traffic on each building does not affect the other.

BUILDING ACROSS LONGER DISTANCES:

It is not always possible to connect two sites with optical fiber because the distance may be too long. It is usually not allowed to lay an optical fiber if the land does not belong to you.

There are two common methods to connect two distant sites.

LEASED SERIAL LINE CONNECTION: Which is less distant.

LEASED SATELLITE CHANNEL:

It can span arbitrarily long distance. It is shown in the figure below.

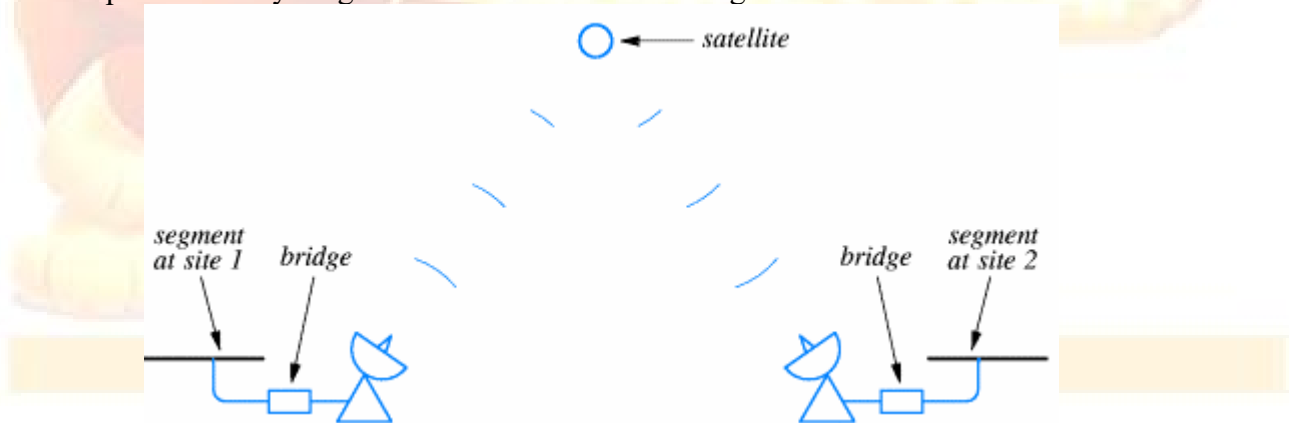


Figure14.2

Unlike optical fibers, satellite connections are low bandwidth to save cost. Because the frames arrived from local network are much faster than they can be sent across a satellite link.

The bridge must use buffering (saving a copy of frame into memory until it can be sent). It may run out of memory. The communication software usually waits for a response after sending a few frames.

A CYCLE OF BRIDGES:

A bridges network can connect many segments. One bridge is needed to connect each segment to the rest of the bridge network. This is shown in the figure below:

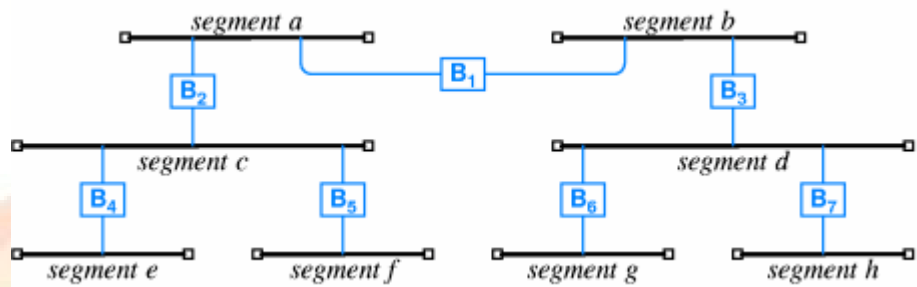


Figure14.3

If the bridges on the longer network form a cycle, then broadcasting frames introduce a problem i.e. the copies of broadcast frame continuously flows around the cycle (each computer receiving an infinite number of copies). This is shown below.



Figure14.4

DISTRIBUTED SPANNING TREE:

If a bridge network forms a cycle, then not all bridges on the network must be allowed to forward broadcast frames.

The bridges configure themselves automatically to decide which bridge will forward broadcast frames and which bridge will not.

The bridges communicate with each other on the network and use Distributed Spanning Tree (DST) algorithm to decide which bridge will not forward frames if a cycle occurs.

Lecture No. 15

SWITCHES AND WAN TECHNOLOGIES

SWITCHING:

A switched LAN consists of a single electronic device that transfers frames among the connected computers. A hub with multiple ports simulates a single shared medium. However a switch simulates a bridged LAN with one computer per segment. A switch is shown in the figure below.

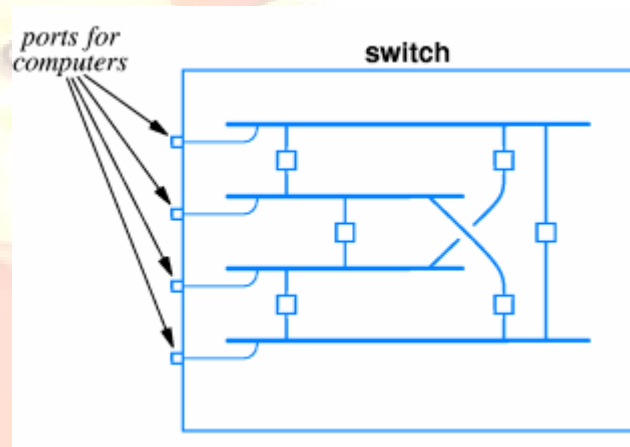


Figure 15.1

If a hub is used to connect among computers on a LAN, then only two computers can communicate at a given time. However if a switch is used, the communication between two computers will not affect the other pair of computers. They can communicate at the same time.

COMBINING SWITCHES AND HUBS:

To reduce costs, computers can be connected and distributed to a number of hubs, and then the hubs can be connected to a switch. Hubs simulate single shared LAN segments and a switch simulates a bridged LAN connecting segments.

BRIDGING AND SWITCHING WITH OTHER TECHNOLOGIES:

Hubs, Bridges and Switches are not limited to Ethernet logical bus topology. They are available also for other networking technologies such as token ring, FDDI etc. like FDDI hub and Token ring hub.

WAN TECHNOLOGIES AND ROUTING;

INTRODUCTION:

LANs can be extended using techniques in previous chapter. They can not be extended arbitrarily for or to handle many computers. Because there are distance limitations even with extensions so we need other technologies for larger networks.

CHARACTERIZATION OF NETWORKS:

There are three types of characterization of networks.

LOCAL AREA NETWORK (LAN):

It is used for a single building.

METROPOLITAN AREA NETWORK (MAN):

It is used for a single city.

WIDE AREA NETWORK (WAN):

It is used for a country level networking and even for continents.

DIFFERENCE BETWEEN LAN AND WAN:

Although LAN is for a local area but satellite bridge can extend LAN across large distances. But it still can't accommodate arbitrarily many computers.

On the other hand WAN must be scalable to long distances and many computers.

PACKET SWITCHES:

To span long distances or many computers, networks must replace shared medium with packet switches. Each switch moves an entire packet from one connection to another. That's why they are called packet switches. A packet switch consists of a small computer with network interfaces, a memory and a program dedicated to packet switching function.

A packet switch is shown in the figure below.

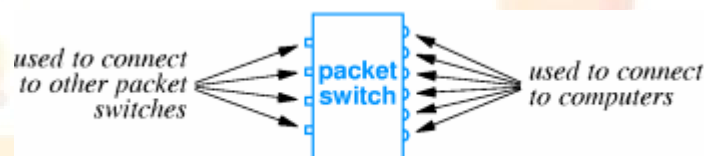


Figure 15.2

CONNECTION TO PACKET SWITCHES:

A packet switch many connect to computers and to other packet switches. But the speeds are different in both cases. There are typically high-speed connections to other packet switches but lower speed connections to the computers. The technology details depend upon desired speed.

PACKET SWITCHES AS A BUILDING BLOCKS:

Packet switches can be linked together to form WAN. WAN need not be symmetric or have regular connections. Each switch may connect to one or more other switches and one or more other computers as shown in the figure below.

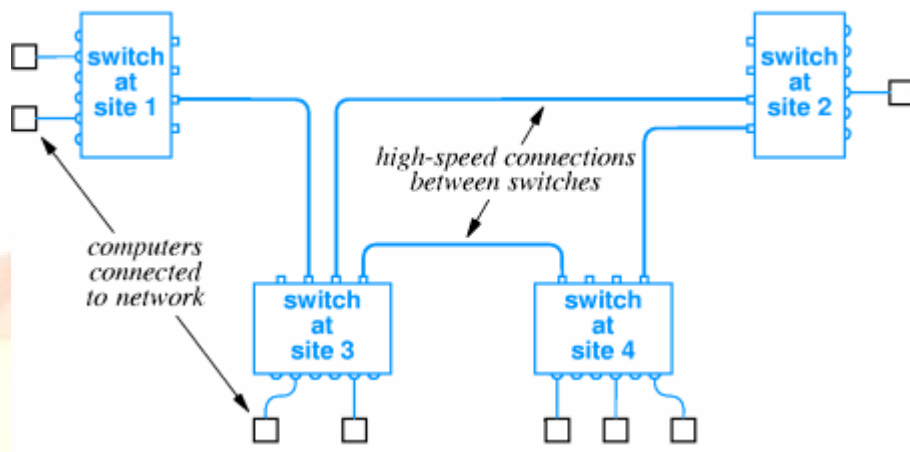


Figure 15.2

STORE AND FORWARD:

Data delivery from one computer to another is accomplished through store and forward technology. In this technology packet switch stores incoming packet and also forwards that packet to another switch or computer. For this purpose packet switch has internal memory into which it can hold packet if outgoing connection is busy. Packets for each connection held on queue.

PHYSICAL ADDRESSING IN A WAN:

The physical addressing in a WAN is similar as in LAN in the following way:

- The data is transmitted in packets equivalent to frames.
- Each packet has a format with header.
- The packet header includes destination and source addresses.
- Many WANs use hierarchical addressing for efficiency. One part of address identifies destination switch. Other part of address identifies port on switch. This is shown in the figure below.

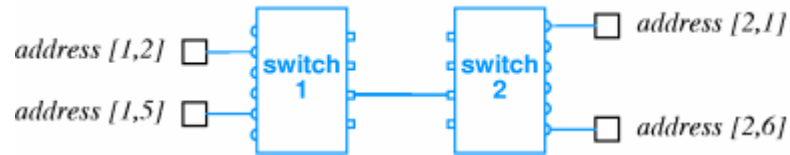
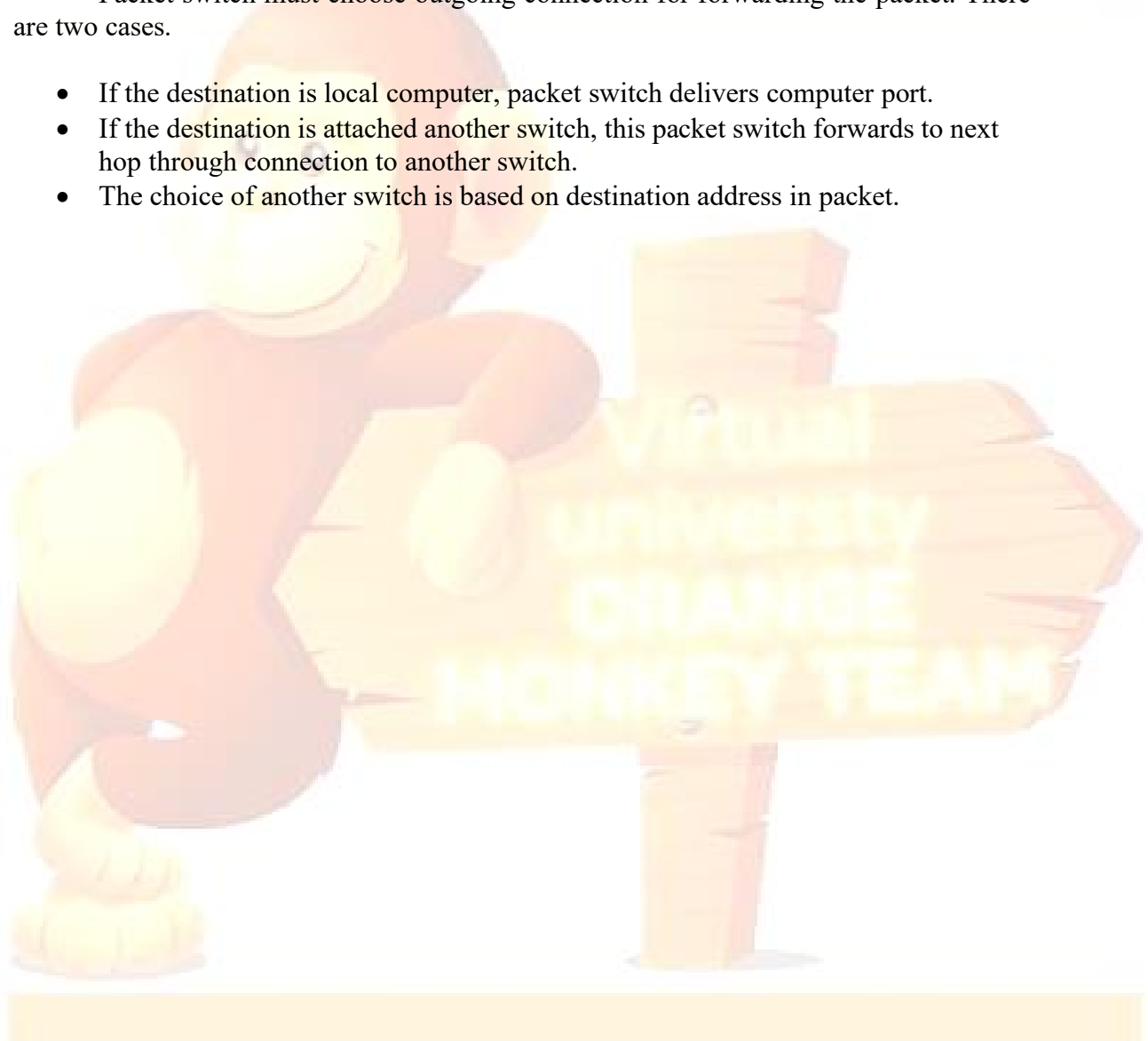


Figure 15.4

NEXT HOP FORWARDING:

Packet switch must choose outgoing connection for forwarding the packet. There are two cases.

- If the destination is local computer, packet switch delivers computer port.
- If the destination is attached another switch, this packet switch forwards to next hop through connection to another switch.
- The choice of another switch is based on destination address in packet.



Lecture No. 16

ROUTING

SOURCE INDEPENDENCE:

Next hop to destination does not depend on source of packet. This phenomenon is called 'Source Independence'. It has several benefits. It allows fast and efficient routing. Packet switch need not have complete information about all destinations in spite it just has next hop so reduces total information and increases dynamic robustness. The network can continue to function even if topology changes without notifying entire network.

HIERARCHICAL ADDRESSING AND ROUTING:

The process of forwarding the packets of information is called routing. The information about destinations is kept in routing tables. Note that many entries have same next hop. It is shown in the figure.

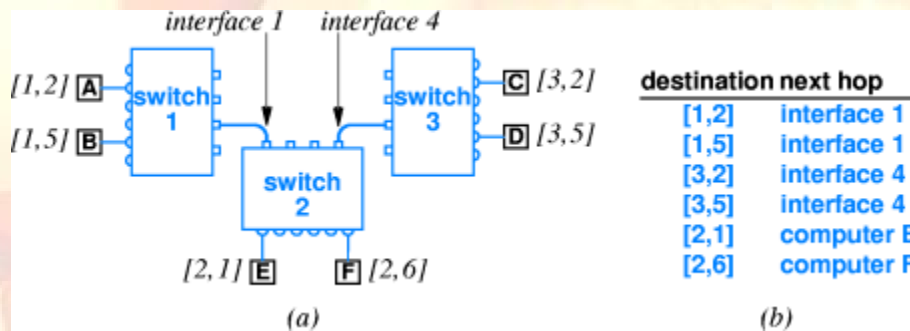


Figure 16.1

In particular all destinations on same switch have same next hop. These routing tables can be collapsed. A specific routing table is shown in the figure.

Destination	Next Hop
(1, anything)	Interface 1
(3, anything)	Interface 4
(2, anything)	local computer

Figure 16.2

ROUTING IN A WAN:

As there will be more computers there will be more traffic of information. We can add capacity to WAN by adding more links and packet switches. Packet switches need not have computers attached. There are two types of switch according to the attached computers.

INTERIOR SWITCH:

The switch that has no attached computers is called an interior switch.

EXTERIOR SWITCH:

The switch that has computers attached with it is called exterior switch. Both interior and exterior switches forward packets and they also need routing tables. The routing table must have two things.

UNIVERSAL ROUTING:

It should have next hop for each possible destination.

OPTIMAL ROUTES:

The next hop in table must be on shortest path to destination.

MODELING A WAN:

To model a WAN, we use a graph in which the nodes model switches and the edges model direct connection between switches. The modeling captures essence of network and it ignores attached computers as shown in the figure below. Modeling of a specific WAN is shown.

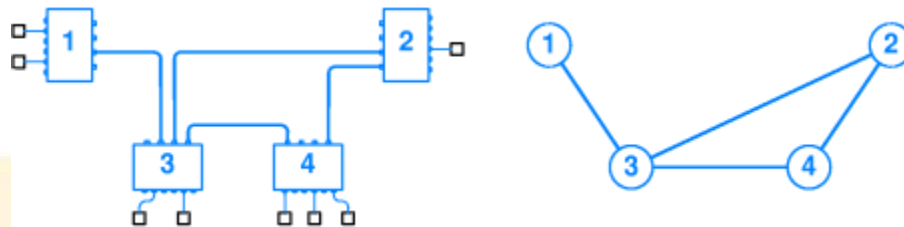


Figure 16.3

ROUTE COMPUTATION WITH A GRAPH:

We can represent routing table with edges as shown in the figure below:

destin- ation	next hop	destin- ation	next hop	destin- ation	next hop	destin- ation	next hop
1	-	1	(2,3)	1	(3,1)	1	(4,3)
2	(1,3)	2	-	2	(3,2)	2	(4,2)
3	(1,3)	3	(2,3)	3	-	3	(4,3)
4	(1,3)	4	(2,4)	4	(3,4)	4	-
node 1		node 2		node 3		node 4	

Figure 16.4

The graph algorithms can be applied to find routes.

REDUNDANT ROUTING INFORMATION:

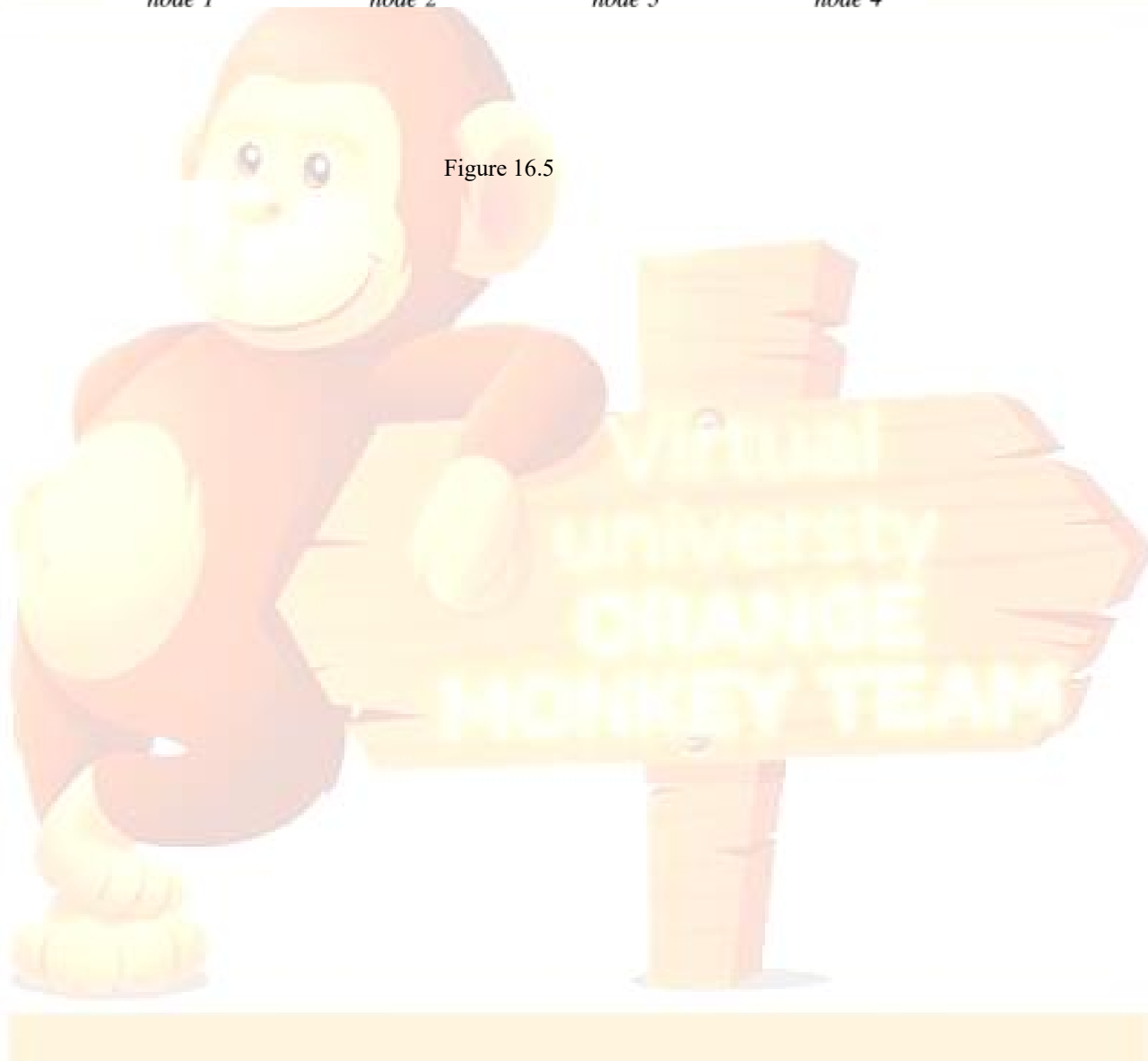
Notice duplication of information in routing table for node 1 as shown above in the figure. We see that switch has only outgoing connection, all traffic must traverse that connection.

DEFAULT ROUTES:

Routing table entries can be collapsed with a default route. If the destination does not have in explicit routing table entry, then it use a default route. Default routes for 4 nodes are shown in the figure below.

destin- ation	next hop	destin- ation	next hop	destin- ation	next hop	destin- ation	next hop
1	-	2	-	1	(3,1)	2	(4,2)
*	(1,3)	4	(2,4)	2	(3,2)	4	-
		*	(2,3)	3	-	*	(4,3)
				4	(3,4)		
<i>node 1</i>		<i>node 2</i>		<i>node 3</i>		<i>node 4</i>	

Figure 16.5



Lecture No. 17

ROUTING ALGORITHMS

BUILDING ROUTING TABLES:

There are basically two methods for building routing tables, which are as follows:

- Manual entry
- Software

Further there are two methods for computing routing table information.

- Static routing
- Dynamic routing

STATIC ROUTING:

It is done at boot time. It is simple and has low network overhead. It is inflexible.

DYNAMIC ROUTING:

It allows automatic updates by a programmer. It can work around network failures automatically.

COMPUTING SHORTEST PATH IN A GRAPH:

While computing shortest path, first we assume graph representation of network at each node then we use Dijkstra's algorithm to compute shortest path from each node to every other node. Then extract next hop information from resulting path information and insert next hop information into routing tables.

WEIGHTED GRAPH:

Dijkstra's algorithm can accommodate weights on edges in graph. The shortest path is then the path with lowest total weight (sum of the weight with all edges). It should be noted that the shortest path is not necessarily with fewest edges (or hops). For example as shown in the figure below:

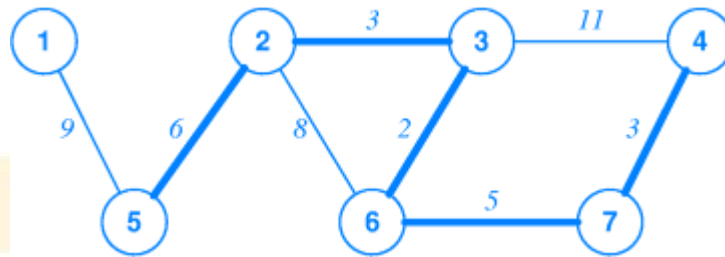


Figure 17.1

The shortest path in the figure from node 2 to node 6 is 2 to 3 and 3 to 6 as this path has the smallest weight so it is the shortest path.

DISTANCE MATRICES:

Weights on graph edges reflect cost of traversing edge. This cost may be in time, dollars or hop counting (weight = 1). The resulting shortest path may not have fewest hops.

DISTRIBUTED ROUTE COMPUTATION:

Each packet switch computes its routing table locally and sends messages to the neighbors. It also updates information periodically. If a link or a packet switch fails then the network adapts its failure. The packet switch then modifies the tables to avoid failed hardware.

DISTANCE-VECTOR ROUTING:

Local information is next hop routing table and distance from each switch. The switches periodically broadcast topology information i.e. destination, distance.

Other switches update routing table based on received information.

VECTOR-DISTANCE ALGORITHM:

It is explained in more detail below:

Packet switches wait for next update message and they iterate through entries in message. If entry has shortest path to destination, insert source as next hop to destination and record distance as distance from next hop to destination plus distance from this switch to next hop.

LINK-STATE ROUTING:

In link-state routing network topology is separated from route computation. Switches send link-state information about local connections. Each switch builds own routing tables. It uses link-state information to update global topology and runs Dijkstra's algorithm.

COMPARISON:

DISTANCE-VECTOR ROUTING:

- It is very simple to implement.
- Packet switch updates its own routing table first.
- It is used in RIP.

LINK-STATE ALGORITHM:

- It is much more complex.
- Switches perform independent computations.
- It is used in OSPF.

EXAMPLE WAN TECHNOLOGIES:

Some multiple WAN technologies are discussed below.

ARPANET:

It began in 1960's. It was funded by Advanced Research Project Agency, which is an organization of US defense department. It was incubator for many of current ideas, algorithms and Internet technologies.

X.25:

It was early standard for connection-oriented networking. It began from IFU, which was originally CCITT. It predates computer connections, which are used for terminal/time sharing connection.

FRAME RELAY:

It is used for Telco service for delivering blocks of data. It is connection based service and must contract with Telco for circuit between two endpoints. It is typically 56kbps or 1.5Mbps and can run to 100Mbps.

SMDS:

Switched Multi megabit Data Service (SMDS) is also a Telco service. It is a connection less service. Any SMDS station can send information to any station on the same SMDS cloud. It typically ranges from 1.5Mbps to 1000Mbps.

ATM (ASYNCHRONOUS TRANSFER MODE):

It was designed as a single technology for voice, video and data and has low jitter (variance in delivery time) and high capacity.

It uses fixed size, small cells, 48 octet's data and 5 octets header. It can also connect multiple ATM switches into a network.



Lecture No. 18

CONNECTION-ORIENTED NETWORKING AND ATM

LANs and WANs can both connect multiple computers, but they have different base technologies and meet different goals. ATM is a single technology that is designed to meet the goals of both LANs and WANs. ATM uses the concept of connection-oriented networking.

ASYNCHRONOUS TRANSFER MODE (ATM):

Telephone companies (Telco's) introduced ATM to meet several goals. It provides universal service for all subscribers and support for all users for voice, video and data. It has a single unified infrastructure (no separate LANs and WANs). It gives guaranteed service when it is appropriate and support for low cost devices.

JITTER:

Jitter is the term used for variance in transmission delays. Jitter is significance for voice, video and data. In LANs, jitter can occur when a packet is delayed because the network is busy.

PACKET SIZES:

Large packets result in fewer overheads because a smaller fraction of the packet is used for header information.

Optimum networks use 4kB packets or larger.

Large packets can't easily be used for voice for example 8-bit samples (at 125usec per sample) would require half a second to fill a 4kB packet. Echo cancellation can only be used with low transmission delays.

ATM CELLS:

To meet its goals, ATM uses small, fixed sized packets called cells. Each cell has 53 octets. VPI/VCI fields identify the cells destination.

PRIORITIZATION tells if cell can be discarded. CRC checks the header bits only. ATM header is about the 10% of the cell. Ethernet can have overhead of only 1%. Engineers sometimes call the ATM overhead the cell tax. An ATM is shown below.

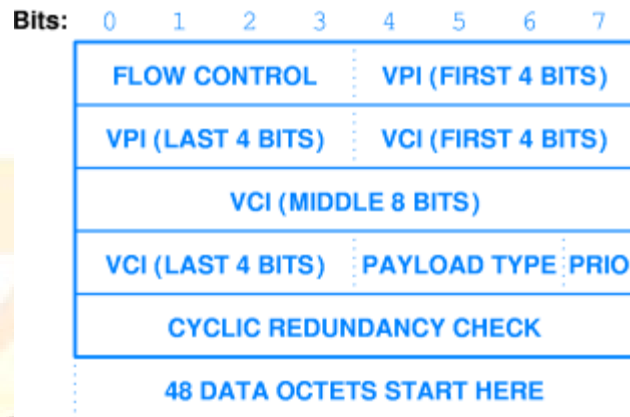


Figure.18.1

CONNECTION-ORIENTED SERVICE:

The connection-oriented service paradigm for networking is similar to the manner in which telephones are used. This is given as follows:

A caller dials a number of the destination. The telephone at the destination signals the arrival of a connection request. If the called person does not answer; the caller gives up after waiting for a timeout. If the called person does answer, then the connection is established.

In data communication, as binary connection identifier is given to each of the two parties to enable identification of the connection.

VIRTUAL CHANNEL (OR CIRCUITS):

Connections in ATM are called virtual channels (VC) or virtual circuits (a term preferred by some). These are called virtual, since connections are formed in ATM by starting values in memory locations (tables) in ATM switches as opposed to making actual electrical connections.

The VC is identified by a 24-bit value formed from the VPI or Virtual Path Indicator (8-bit), which identifies a particular path through the network and the VCI or Virtual Channel Indicator (16-bits), which identifies the channel in the virtual path being used by the connection.

Most frequently, the 24-bit pair is treated as just a single connection identifier by computers.

Lecture No. 19

ATM: VIRTUAL CIRCUITS

LABELS AND LABEL SWITCHING:

An ATM network is built from interconnected ATM switches. The attachment points or ports can be connected to computers or other ATM switches. As cells arrive at an ATM switch, their VPI/VCI is modified using a forwarding table that gives the new VPI/VCI for the next leg of the cell's trip.

The forwarding table is essentially indexed by the incoming cell's VPI/VCI and the contents yield the new VPI/VCI.

LABEL REWRITING:

The replacement of the incoming cell's VPI/VCI with a probably different VPI/VCI is called rewriting.

ATM is thus called a label rewriting or label switching system. Thus two computers with a connection through an ATM network will likely have different VPI/VCI values for each end of the connection as shown in the figure below.

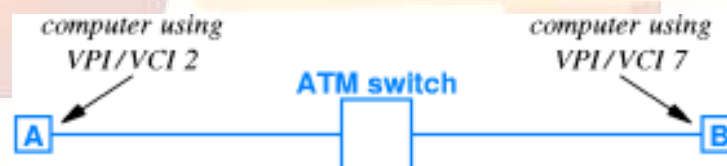


Figure 19.1

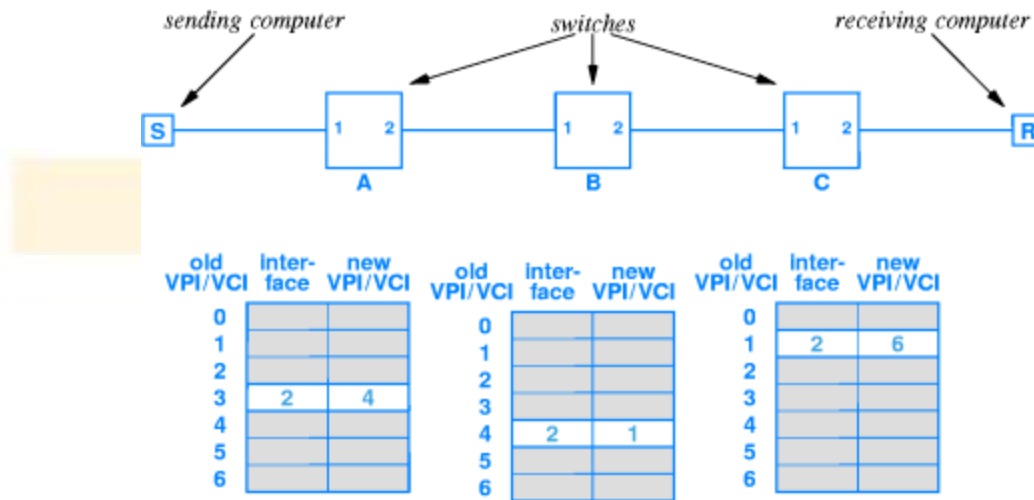


Figure 19.2

EXAMPLE:

As an example, in the figure we see that the sending computer S uses a VPI/VCI of 3 and sends a cell.

Switch A receives the cell and looks up 3, then rewrites the VPI/VCI as 4, and sends the cell out of its port 2.

Switch B receives the cell and looks up 4 then rewrites the VPI/VCI as 1 and sends the cell at its port 2.

Switch C receives the cell and looks up 1 then rewrites the VPI/VCI as 6 and sends the cell out of its port 2.

The receiving computer R receives the cell with a VPI/VCI of 6, which is the value it is using for the connection. Forwarding tables in each switch must be coordinated to define meaningful 'paths' through the network.

PERMANENT VIRTUAL CIRCUITS:

ATM can provide customers with virtual circuits that look like traditional leased digital circuits. Such permanent virtual circuits (PVC) last as long as the customer pay the periodic fee for its use. The forwarding tables are automatically restored after power of equipment failure. The forwarding table entries for such permanent VC's are statically configured, the terms used by Telco's for this is provisioning.

Provisioning requires two steps:

1. To determine a complete path (that is, identify the switches that will be used).
2. To choose appropriate VPI/VCI for each step in the path, and configure each adjacent pair of switches (easy, since each switch rewrites the VCI/VPI).

SWITCHED VIRTUAL CIRCUITS:

Most networks offer dynamic connections, which last for a relatively short time. To handle this, ATM can dynamically establish a switched virtual circuit (SVC), allow it last as long as necessary and then terminate it.

The terminology comes from the Telco's where switching system normally refers to all switching.

ESTABLISHING AN SVC:

The computer sends a connection request to the switch to which it is attached. Software in the switch finds a network path to the destination and sends along the connection request.

Each pair of switches in the path communicates to choose a VPI/VCI for their tables. Once the connection is established by the destination, a message is sent back to the originating computer to indicate the SVC is ready.

If any switch or the destination computer does not agree to setting up the VC, an error message is sent back and the SVC is not established.

SIGNALING:

The term signaling is used to describe communication about the network, as opposed to communication that just uses the network.

A computer uses signaling with reserved VCI/VPI values to communicate with a switch to establish a connection or send other network control messages. These connection requests and network control messages are also sent in cells and since the VPI/VCI use in these cells are reserved there is no confusion between data and control cells.

QUALITY OF SERVICE:

Networks are more frequently being designed to allow specification of the quality of service required by users.

For example: - a typical voice telephone call might give a QoS parameter for throughput of 64kbps and delay less than 500msec. A user sending video might require throughput of 2Mbps.

PROVIDING DESIRED QoS:

QoS desires are specified at connection setup time and one never altered for the connection duration. Switches along the path must reserve resources to guarantee the QoS.

If a switch cannot provide the resources, it rejects the connection requests and an appropriate error message is returned.

ATM QoS SPECIFICATIONS:

There are three types of QoS specifications, which are given as follows:

CONSTANT BIT RATE (CBR):

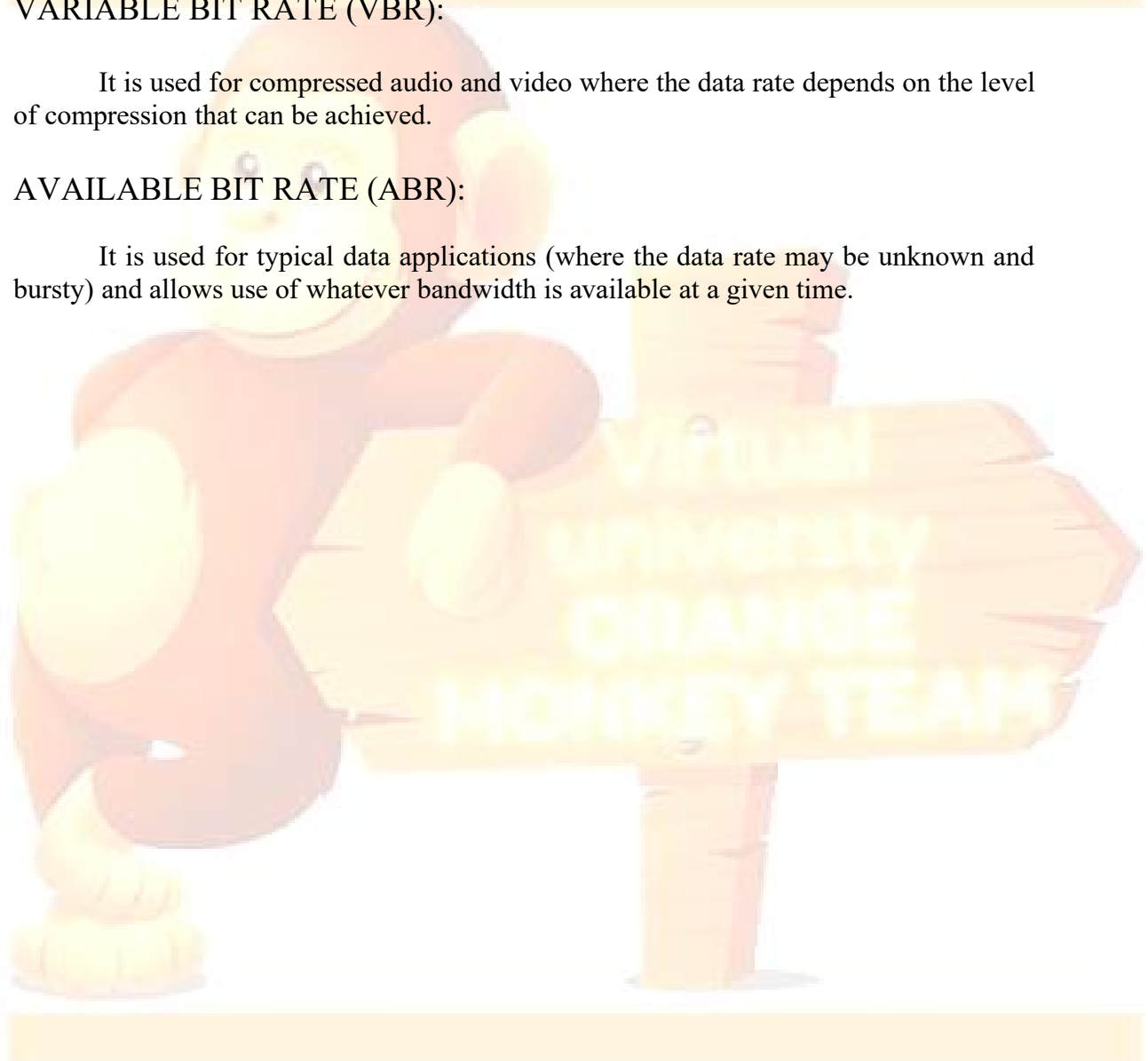
It is used for audio and video, since these have predefined maximum data rates.

VARIABLE BIT RATE (VBR):

It is used for compressed audio and video where the data rate depends on the level of compression that can be achieved.

AVAILABLE BIT RATE (ABR):

It is used for typical data applications (where the data rate may be unknown and bursty) and allows use of whatever bandwidth is available at a given time.





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1. In Cyclic Redundancy Checking, CRC is _____.
 - a. Divisor
 - b. Quotient
 - c. Remainder page 20
 - d. Dividend
2. The satellite or radio topology in which all computers are connected to each other via satellite or radio wave is a kind of
a. Broadcast network page 5
- b. Point-to-Point network
3. Which of the following two operations are performed by Ethernet CD?
 - I. It monitors outgoing signals.
 - II. Grabbled signal is interpreted as a collision.
 - III. Signals are sent back to the sender.
 - a. I and III
 - b. II and IV
 - c. II and III
 - d. I and II page 28
4. The process of forwarding a packet is called _____.
 - a. Routing page 58
 - b. Processing
 - c. Hierarchical Addressing
 - d. Source Addressing
4. Which statement is correct about Network Interface Card (NIC)?
 - I. NIC contains sufficient hardware to process data independent of system CPU
 - II. NIC looks like any other I/O device to system CPU
 - III. NIC also receives interrupt on incoming data.
 - a. I and II
 - b. II and III
 - c. I and III
 - d. All of the given options page 40

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5. While transmitting data from source A to destination B, 4 bits are changed during the transmission then the error is a _____.
a. Burst error page 22
b. Single error
c. Double error
d. Logic error
6. The switch that has no attached computers is called _____.
a. Packet Switch
b. Exterior Switch
c. Interior Switch page 59
d. External Switch
7. _____ is the most popular wiring scheme because of lowest cost.
a. 5 Base T
b. 10 Base T page 43
c. 100 base T
d. 1000 base T
8. In _____ technique, all members of the network can send data only on the specific time slot?
a. CDMA
b. FDMA
c. CSMA page 43
d. TDMA
9. If a sender with a 100 Megabit NIC and receiver with 10 Megabit NIC wants to communicate with each other at which speed they can communicate?
a. 100 Megabit page 40
b. 110 Megabit
c. 1000 Megabit
d. 10 Megabit
9. Missing _____ in a frame format indicates receiving computer missed beginning of the message.
a. eot
b. soh page 16
c. sot
d. eoh
10. The _____ of errors is easier than the _____ of errors.
a. correction; detection
b. detection; correction cs601 handouts
c. correction; creation
d. detection; manipulation

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10. The _____ of errors is difficult than the _____ of errors.
a. correction; detection **google**
b. detection; correction
c. correction; creation
d. detection; manipulation
11. Source Independence phenomenon allows fast and efficient _____.
a. Source Addressing
b. Routing
c. Packet Switching **page 58**
d. Store and forward
12. In distributed route computation process each packet switch computes its routing table locally and sends messages to the _____.
a. Router
b. Graph
c. Neighbors **page 63**
d. WAN
13. The _____ layer of the OSI model takes the data from the physical layer and perform error checking.
a. Transport
b. Data link **google**
c. Application
d. Presentation
14. CBR stands for _____.
a. Constant Byte Rate
b. Constant Bit Rate
c. Connection break Recovery
d. Constant Borrow Rate
15. A network that uses _____ usually consist of a single long cable to which computer attach.
a. Star Topology
b. Ring Topology
c. Bus Topology **page 26**
d. Bus and Ring Topology
16. If simultaneous transmission occurs, the frames interfere with each other and this phenomenon is called _____.
a. packet loss
b. collision **page 28**
c. delayed transmission
d. coordination

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16. In _____ all computers are attached to a central hub
- a. Ring topology
 - b. Star topology** page 31
 - c. Hub topology
 - d. Bus topology
17. For adding a new computer in a point to point network _____ new connection will be required
- a. N
 - b. N-1** page 23
 - c. N-2
 - d. 2n
18. The fastest Ethernet hardware operates at a rate of _____
- a. 1000 bps
 - b. 100 Mbps** page 27
 - c. 10 Mbps
 - d. 1000 Mbps
18. Which of the following the benefit to point to point communication?
- a. Quick to configure
 - b. Security implementation** page 23
 - c. Cost
 - d. Less availability
19. ATM offers _____ speed and _____ delay
- a. High, High
 - b. High, low** page 72
 - c. Low, low
 - d. Low, high
20. Thick Ethernet is known as _____
- a. 10 Base 2
 - b. 10 Base 5** google
 - c. 10 Base T
 - d. 10 Base 10
21. Both interior and exterior switches _____ packet and they also need routing tables.
- a. Create
 - b. Delay
 - c. Forward** page 59
 - d. Start

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22. _____ is the rate at which data can be sent through the network
- a. Throughput page 79
 - b. Propagation delay
 - c. Access delay
 - d. Switching delay
23. In a ping command, small –sized information packets of _____ are sent.
- a. TCP
 - b. UDP
 - c. ICMP page 11
 - d. IGMP
24. Many WANs use _____ addressing of efficiency
- a. Sequence
 - b. Forward
 - c. Hierarchical page 56
 - d. Sequential
25. Which of the following is not a function of ping commands?
- a. Local computer network issue
 - b. Congestion in the network
 - c. Relay nodes page 11
 - d. Remote host availability
26. Packet switched can be linked together to form a _____
- a. LAN
 - b. WAN page 56
 - c. Bridge
 - d. None of the given option
27. Fixed network is a type of network which is classified with respect to the _____ factor
- a. Size
 - b. Connectivity
 - c. Medium
 - d. Mobility page 6
28. Parity bit can detect _____ error(s)
- a. 4
 - b. 3
 - c. 2 page 19 (even or odd)
 - d. 1

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29. When we will try to connect to the internet which of the following protocol will be used?
- a. Telnet
 - b. TCP/IP** page 84
 - c. ICMP
 - d. IPx
30. How many computers are mandatory to form a network?
- a. 1
 - b. 2** google
 - c. 4
 - d. 8
31. _____ is standard wireless LAN that uses radio signals at 2.4GHz.
- a. IEEE 803.16
 - b. IEEE 802.15
 - c. IEEE 802.3
 - d. IEEE 802.11** page 29
32. LAN interface hardware obeys _____ access rule.
- a. CSMA/CD** page 34
 - b. Round robin
 - c. First come first served
 - d. High priority
33. The most important task a bridge performs is _____.
- a. Packet switching
 - b. Line controlling
 - c. Noise controlling
 - d. Frame filtering** page 50
34. ATM uses small, fixed-sized packets called cells and each cell has _____ octets.
- a. 47
 - b. 52
 - c. 53** page 66
 - d. 55
36. _____ can't be guaranteed with variable length packets as easily as it can with fixed length cells.
- a. Errors
 - b. Noise
 - c. Quality of Service** page 72
 - d. None of the given

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37. Which multiplexing technique transmits digital signals?
a. WDM
b. FDM
c. TDM page 15
d. GSM
38. Connections in Asynchronous transfer mode are called _____.
a. Virtual channels page 67
b. Virtual Path Identifier
c. Cells
d. Cell tax
39. A _____ is a device that combines multiple signals and forwards into a single line.
a. Modem
b. Multiplexer page 41
c. Repeater
d. Layer 3 Switch
40. _____ is inflexible.
a. Routing
b. Searching
c. Processing
d. Static routing page 62
41. If a hub is used to connect many computers in a LAN, then only _____ computers can communicate at a given time.
a. Three
b. Two page 54
c. Four
d. One
42. _____ is the term used for variance in transmission delays.
a. Friction
b. Segment
c. Checksum
d. Jitter page 66
43. _____ is also called self healing network.
a. ATM
b. FDDI
c. Token Ring page 46
d. Frame relay

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44. _____ and _____ are the two frame types.
- a. Internal and external
 - b. Single and dual
 - c. Implicit and explicit
 - d. Multicast and broadcast **page 35**
45. Bluetooth uses shared medium and _____ instead of coaxial cable.
- a. Radio waves **page 29**
 - b. Infrared waves
 - c. Micro waves
 - d. Low frequency waves
46. Which of the following is not a guided medium?
- a. Twisted-pair cable
 - b. Fiber-optic cable
 - c. Atmosphere **google**
 - d. Coaxial cable
47. As a result of ARPA research, the first network was established which was named as _____.
- a. INTERNETWORKING
 - b. ARPNET
 - c. ARPANET **page 9**
 - d. PACKET NETWORK
48. Asynchronous transfer mode (ATM) can dynamically establish a _____.
- a. Switched virtual circuit **page 70**
 - b. Virtual connection identifier
 - c. Virtual path indicator
 - d. None of the given options
49. A typical port on an ATM switch operates at _____ or _____ higher.
- a. OC-2 speed (155Gbps)
 - b. OC-2 speed (1000Mbps)
 - c. OC-3 speed (155Mbps) **page 72**
 - d. OC-3 speed (100Gbps)
50. 10Base-T Ethernet is often called a _____.
- a. ring shaped star
 - b. ring shaped bus
 - c. star shaped bus **page 46**
 - d. star shaped ring

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51. _____ allows automatic updates.
a. **Dynamic routing** page 62
b. Static routing
c. Routing
d. Default routing
52. Handling variable length packets leads to memory _____.
a. **Fragmentation** page 72
b. Management
c. Location
d. Allocation
53. In order to forward a copy of frame, the bridge uses _____ address.
a. Network
b. **Destination** page 51
c. IP
d. Source
54. We may use _____ to extend local area network.
a. Bridge, Router
b. Bridge, Hub, Router
c. **Bridge, Hub, Repeater** page 149
d. Bridge, Hub, Repeater, Router
53. All of the given options are the types of delay except _____.
a. Propagation
b. Access
c. **Throughput** page 79
d. Queuing
54. While computing shortest path in a graph, next hop information is inserted into _____.
a. **Routing table** page 62
b. Trailer
c. Header
d. Register
55. LAN interface uses _____ to copy frame data directly from main memory
a. **DMA** page 34
b. PDDI
c. Hard disk
d. Flash

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56. The Gigabit Ethernet hardware operates at a rate of _____.
a. 10 Mbps
b. 100 Mbps
c. 1000 Mbps reference book page 263
d. 1000 Gbps
57. In the early resource sharing era, which resources were shared among users?
a. Computation page 9
b. Floppy Drives
c. Hard Disk
d. Printers
58. If two buildings are located far from each other then bridge, and _____ can be used to connect two LAN.
a. Optical fiber page 51
b. Ethernet modem
c. Switch
d. NIC
59. Which type of network consists of wireless connection of laptops in a university classroom?
a. WAN
b. MAN
c. Fog
d. LAN google
60. A typical bridge has _____.
a. One NIC, a CPU a memory and a ROM.
b. Two NICs, a CPU a memory and a ROM. page 50
c. RAM, ROM and CPU.
d. A cache memory, ROM and CPU.
61. _____ is used for compressed audio and video, where the data rate depends on the level of compression that can be achieved.
a. Constant Bit Rate
b. Stable Bit Rate
c. Variable Bit Rate page 71
d. Available Bit Rate
62. There are _____ types of data stuffing.
a. 1
b. 2 page 17
c. 0
d. 5

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63. Dijkstra's algorithm can accommodate weights on _____ in graph.
a. Nodes page62
b. Edges
c. Path
d. Connections
64. _____ masks your IP address.
a. Firewall
b. Antivirus
c. VPN
d. Incognito mode
65. Static routing computes routing table information at _____ time.
a. Load
b. Boot page 62
c. Execute
d. One
66. _____ was the first automated tool required to see whether the given computer is online or not.
a. Probing program
b. PING program page 11
c. status program
d. None of the above
67. In which type of error detection, the arithmetic sum is calculated before and after the transmission of data at both communication ends?
a. CRC
b. Parity
c. Checksum page 19
d. Hash Function
68. Computer sends a connection request to the _____ to which it is attached while establishing a switched virtual circuit
a. Bridge
b. Switch page 70
c. VPI
d. Virtual circuit
69. The bridges communicate with each other on the network and use _____ algorithm to decide which bridge will not forward frames if a cycle occurs.
a. Dijkstra
b. Shortest path first
c. Vector distance
d. Distributed Spanning Tree page 53

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70. Ethernet uses a _____ bit static addressing scheme in which each device is assigned a unique address by the manufacturer.
- a. 64
 - b. 48**
 - c. 32
 - d. 16
71. Weights on graph edges reflect cost of _____.
- a. Nodes
 - b. Traversing edge** page 63
 - c. Trending edge
 - d. Path
72. A _____ relies on the hardware manufacturer to assign a unique physical address to each network interface.
- a. Static addressing scheme** page 34
 - b. Configurable addressing scheme
 - c. Dynamic addressing scheme
 - d. None of the given
73. In _____ topology, if the switch goes down all the computers will be disconnected.
- a. Star**
 - b. Ring
 - c. Bus
 - d. Mesh
74. Which type of network consists of wired computers in a university classroom?
- a. MAN
 - b. PAN
 - c. WAN
 - d. LAN**
75. If you as a network administrator want to know the traffic flow of your data while communicating with a remote computer which of the following will be used to know about intermediate routers?
- a. Ipcnfig
 - b. Ping** page 11
 - c. Traceroute
 - d. Arp
76. Hardware address is also called _____.
- a. Physical address**
 - b. Logical address
 - c. IP address
 - d. Port address

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77. Thick Ethernet also requires _____ to avoid signal reflectance.
a. Transceivers
b. AUI cable
c. Drop cable
d. Terminators page 41
78. Which of the following network is using the TCP/IP model globally?
a. PAN
b. SAN
c. LAN
d. The Internet
79. VPNs connections are sometimes called _____.
a. Tunnels page 75
b. Open networking
c. Routing
d. Public network
80. To reduce _____ computers can be connected and distributed to a number of hubs, then the hubs can be connected to a switch.
a. Costs page 54
b. Quality
c. Efficiency
d. Noise
81. If a _____ is used the communication between two computers will not affect the other pair of computers and they can communicate at the same time
a. Hub
b. Switch page 54
c. Repeater
d. Amplifier
82. The length of hardware address is _____.
a. One to ten bytes
b. One to five bytes
c. One to six bytes page 34
d. One to seven bytes
83. A network analyzer is also called _____.
a. Network manager
b. Network administrator
c. Network monitor page 37
d. Network

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84. No any error detection scheme is perfect because transmission errors can affect

_____.

a. Data

b. Additional Information

c. Additional information & data google

d. Transmission medium

85. The token ring network topology is a ring but wiring topology is a _____.

a. Star page 44

b. bus

c. tree

d. mesh

86. _____ addresses are used in an ethernet frame.

a. IP page 99

b. Port

c. Logical

d. MAC

87. AUI cable connects from NIC to _____.

a. BNC Connector

b. RJ-45 Connector

c. Transceiver page 41

d. Terminator

88. Public networks are _____.

a. More secure than LAN

b. Flexible page 74

c. Limited in boundary

d. Intranet

89. The maximum cable length of a LAN is fixed because _____.

a. Additional hardware are not suitable for the LAN extension.

b. The electrical signal level gets weaker as it travels. Page 48

c. Additional software are not suitable for the LAN extension

d. The electrical signal level gets stronger as it travels.

90. In _____ network topology is separated from route computation.

a. Local area

b. Link-state routing page 64

c. Static routing

d. Dynamic routing

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91. Which layer of the OSI Model directly communicates and controls the transmission medium:
- a. Transmission
 - b. Physical**
 - c. Application
 - d. Network
92. In _____ technique data is treated as a sequence of integers and their arithmetic sum is computed and the carry bits are added to the final sum.
- a. CRC
 - b. Bit stuffing
 - c. Checksum** page 19
 - d. 2D Parity
93. A network with _____ jitter takes more time to deliver some packets than others.
- a. Zero
 - b. High** page 80
 - c. Low
 - d. Moderate
94. A network uses _____ to arrange computers in a single closed loop.
- a. Star Topology
 - b. Mesh Topology
 - c. Ring Topology** page 25
 - d. Bus Topology
95. Which of the following tasks is not done by the second layer of the OSI model?
- a. Flow control
 - b. Framing
 - c. Channel coding** google
 - d. Error control
96. ATM is a single technology designed to meet the goals of both _____ and _____.
- a. LAN & PAN
 - b. LAN & WAN** page 66
 - c. LAN & MAN
 - d. MAN & WAN
97. LAN and WAN are classified according to their _____.
- a. Size** page 4
 - b. Connectivity
 - c. Medium
 - d. Mobility

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98. The identifier that is used for data transfer in the virtual circuit network is called _____.

- a. Virtual circuit identifier
- b. Global address
- c. Network identifier
- d. IP identifier

99. In Direct point to point communication adding the Nth computer requires _____ new connections

- e. N^2
- f. $N-1$
- c. $(N^2 - N)/2$ page 23
- d. $N(N-1)$

100. Which of the following is the correct function of bridge?

- a. MTU path discovery
- b. Byte stuffing
- c. Routing information
- d. Filtering and forwarding a frame page 50, 51

Point to point topology is

- a. Size based
- b. Mobility based
- c. Connectivity based page 5
- d. Medium based

101. IEEE LLC / SNAP header is _____ which is used to specify the type of data.

- a. 8 octets google
- b. 16 octets
- c. 32 octets
- d. 64 octets

102. IEEE LLC / SNAP header is _____ which is used to specify the type of data.

- a. CRC
- b. Bit stuffing
- c. Checksum
- d. 2D Parity

103. What is the largest network in existence?

- a. The internet google
- b. A PAN
- c. A Fog
- d. Edge Network

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104. The frame format of any LAN technology must consists of ____ and ____ -

- a. Payload and CRC
- b. Frame header and CRC
- c. Payload and Frame type

d. Frame header and payload page 36

105. _____ can occur a LANs when a packet is delayed because the network is busy

a. Jitter page 66

- b. Loop
- c. Deadlock
- d. variance

106. Which of the following cannot be used to extend a LAN?

- a. Repeaters
- b. Switches
- c. Routers

d. Fiber modems

107. Links-state algorithm is used in _____

- ☐ RIP
- ☐ IGRP
- ☐ RIPv2
- ☐ **OSPF**

page 64

108. According to size, there are ____ classifications of networks

a. 2 page 2

- b. 3
- c. 4
- d. 5

108. In which topology terminators are used at the end of the cable?

- a. Star
- b. Bus**

- c. Ring
- d. Mesh

109. A switch simulates a _____ LAN connecting segments

- e. Single
- f. Single shared
- c. Bridged

page 54

- d. Complex

110. 1PVS stands for _____

a. Permanent virtual circuit page 69

- b. Private virtual circuit
- c. Public virtual circuit

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d. Plastic virtual circuit

111. Hardware that calculates a CRC used two simple components _____

a. AND unit and XOR Unit

b. Shift register and XOR unit page 20

c. Shift register & AND unit

d. Shift register and Shift XCR unit

112. Thin ethernet is known as _____

a. 10 base 2 google

b. 10 base 5

c. 10 base T

d. All of the above

113. If a sender with a 1 Gigabit NIC and receiver with 100 Megabit NIC wants to communicate with each other than at which speed they can communicate

a. 11 Megabit

b. 100 Megabit

c. 1 Gigabit

d. 1.1 Gigabit

114. _____ is used as an alternative of packet for a specific computer network technology

e. Datum

f. Token

g. Ether

d. Frame page 14

115. The sharing of a medium and its link by two or more devices is called _____

a. Modulation

b. Encoding

c. Multiplexing

d. Line discipline

116. The topology each computer is connected to a central hub is called

e. Ring topology

b. Star topology page 5

c. Tree topology

d. Mesh topology

117. Asynchronous transfer mode (ATM) is designed to work on fiber but can be used with _____

a. wireless

b. Twisted pair page 72

c. Wifi

d. Bluetooth

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118. The basic responsibility of NIC is _____
- a. To access medium network
 - b. To resource allocation
 - c. To access memory
 - d. All of the given option
119. 1Frame relay is _____
- a. Connection oriented service page 64
 - b. Connectionless service
 - c. Typically ranges for 5 Mbps to 1000Mbps
 - d. Call based
120. The length of time required to send a variable length packet is _____
- a. 5 second
 - b. Variable page 72
 - c. Constant
 - d. Fix
121. ABR stands for _____
- a. Asynchronous bit rate
 - b. Asynchronous byte recovery
 - c. Asynchronous bit redundancy
 - d. Available bit rate page 71
122. In Token Ring, if all computers are ready to transmit it enforces _____ access
- a. First come first served
 - b. Round Robin page 30
 - c. Shorter delay
 - d. Last come first served
123. The Ethernet standard specifies that frames are sent using the _____ scheme.
- a. Differential Manchester
 - b. Not Return to Zero (NR2)
 - c. Manchester Encoding page 27
 - d. Return to Zero (RZ)
124. ATM uses the concept of _____.
- a. Connection-oriented page 66
 - b. Connection-less
 - c. variable packet size
 - d. Fixed and variable packet size

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124. Which of the following is a benefit of point to point communication?

- a. Quick to configure
- b. Security implementation**
- c. Cost
- d. Less availability

125. _____ is not used to extend LAN.

- e. Hub
- f. Fiber modem**
- g. Repeater
- h. Bridge

126. Which types of VPNs are used for corporate connectivity across companies residing in different geographical locations?

- i. Remote access VPNs
- j. Peer-to-peer VPNs
- k. Country-to-country VPNs

d. Site-to-site VPNs google

127. Star topology is the kind of

- o Tree topology
- o b. Point-to-point topology** page 05
- o Broadcast topology
- o Ring topology

127. In a _____ state, a bridge allows simultaneous use of each segment.

- o Ready
- o Steady**
- o Final
- o Startup

128. The network occupies larger areas like cities & countries is called

- o LAN
- o WAN**
- o MAN
- o All of the above

129. In link state routing _____ send link-state information about local connections.

- o Bridges
- o Switches**
- o Routers
- o Hubs

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130. Transmission media are usually categorized as _____.
☒ Guided or unguided
☐ Fixed or unfixed
☐ Determinate or indeterminate
☐ Metallic or nonmetallic
131. Even parity can be used to check for _____ bit/ bits of errors.
☒ a. 1 page 18
☐ 2
☐ 3
☐ 0
132. Routing table entries can be _____ with a default route.
☒ Collapsed
☐ Redirected
☐ Emerged
☐ Guaranteed
133. The system administrator must coordinate to avoid the conflict in _____ hardware addressing scheme.
a. Static
b. Dynamic
☒ c. Configurable
d. Fixed
134. _____ network does not depend on CSMA/CD.
☒ Ethernet
☐ Fast Ethernet
☐ Gigabit Ethernet
☐ Wireless
135. Which of the following technologies can extend the diameter of LAN medium?
☐ Fiber optic
☐ Repeater
☐ Diameter of LAN medium is not extendable
☒ Both. Fiber optic and Repeaters
136. Connections are formed in Asynchronous transfer mode by starting values in _____ in ATM switches, as opposed to making actual electrical connections.
☐ Heap
☐ Stack
☐ Virtual Circuit
☒ d. Memory locations page 67

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137. The _____ scheme must be reliable to prevent conflicts. a. Static

b. Dynamic page 34

c. Configurable

d. Fixed

138. Metropolitan area network is used for _____.

a. City page 55

b. Building

c. Country

d. Continent

139. Which addressing can be only used in the local area networks?

☐ **a. IP** google

☐ Physical

☐ Port

☐ Protocol

139. The sharing of a _____ among the workers in an office is a goal of resource sharing.

a. Mouse

b. Printer page 9

c. Keyboard

d. Motherboard

140. ATM uses fixed size, small cells, 48 octet's data and _____.

a. 3 Octets header

b. 5 Octets header page 65

c. 6 Octets header

d. 7 Octets header

141. Which of the followings is not an advantage of framing?

a. Missing eot indicates sending computer crashed

b. Missing soh indicates receiving computer missed beginning of message

c. Delimiters do not contain any user data page 16

d. Bad frame is discarded

142. The _____ field of Ethernet frame has the purpose of receiver synchronization.

a. Preamble page 36

b. Frame Type

c. Data

d. CRC

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Question No:1

(Marks:1)

Vu-Topper RM

Uses counter rotating rings in which data flows in opposite directions.

Ans: FDDI Page 31

Question No:2

(Marks:1)

Vu-Topper RM

The Ethernet speed was originally 3Mbps, and the current standard is the fast Ethernet operates at 100Mbps.

Ans: 10Mbps Page27

Question No:3

(Marks:1)

Vu-Topper RM

Mapping between a protocol address and a hardware address is called_.

Segmentation

Hashing

Address Resolution

Question No:4

(Marks:1)

Vu-Topper RM

Protocols of TCP/IP layering model specify how to organize data into frame and how a computer transmits frames over a network.

Session

Network interface layer

Internet Layer

Question No:5

(Marks:1)

Vu-Topper RM

In Closed-form computation, the protocol address assigned to a computer is chosen carefully so that computer's hardware address can be computed from the protocol address using basic Boolean and operations.

Arithmetic

XOR

Shift

Question No:6

(Marks:1)

Vu-Topper RM

As the Internet grew, the original Classful addressing scheme became a limitation. The IP address space was being exhausted because all networks had to choose one of possible sizes.

Three

two

four

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Question No:7

(Marks:1)

Vu-Topper RM

Dotted decimal notation is a syntactic form the IP software uses to express binary values when interacting with humans.

8-bit

16-bit

32-bit

Question No:8

(Marks:1)

Vu-Topper RM

protocols of TCP/IP layering model specify how to ensure reliable transfer.

Physical Layer

Network Interface Layer

Transport Layer

Question No:9

(Marks:1)

Vu-Topper RM

In the IP address identifies an individual computer on the network.

Prefix

Suffix

Mux

Question No:10

(Marks:1)

Vu-Topper RM

Internet protocol (IP) address version 4 is comprised of bits.

48

32

24

Question No:11

(Marks:1)

Vu-Topper RM

A separate table is used for each physical network.

bit-binding

Checksum

address-binding

Question No:12

(Marks:1)

Vu-Topper RM

Inside a computer, each address mask is stored as a bit value.

48

64

32

Question No:13

(Marks:1)

Vu-Topper RM

Dotted decimal represents each octet in and uses a dot to separate octets.

decimal

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Question No:14**(Marks:1)****Vu-Topper RM**

of TCP/IP Protocol Suit specifies the format of packets sent across Internet as well as the mechanisms used to forward packets.

Physical Layer

Data Link Layer

Internet Layer**Question No:15****(Marks:1)****Vu-Topper RM**

The IP class scheme does not divide the address space into equal size class and the classes do not contain the same number of networks.

16-bit

32-bit

48-bit

Question No:16**(Marks:1)****Vu-Topper RM**

of TCP/IP protocol suit defines the basic characteristics of network hardware.

Physical Layer

Data Link Layer

Internet Layer

Question No:17**(Marks:1)****Vu-Topper RM**

The protocol address of the next hop must be to an equivalent hardware address before a packet can be sent.

Encrypted

Decrypted

Translated**Question No:18****(Marks:1)****Vu-Topper RM**

Address Resolution Protocol is mostly used to bind a 32-bit IP address to an _ Ethernet address.

16-bit

48-bit

64-bit

Question No:19**(Marks:1)****Vu-Topper RM**

TCP/IP defines the term to refer any computer system that connects to a network and runs applications for users.

Router

Host computer

Bridge

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Question No:20

(Marks:1)

Vu-Topper RM

are two standard implementations to improve computational efficiency.

Hashing and Direct indexing

Segmentation and Fragmentation

Queuing and Packetizing

Question No:21

(Marks:1)

Vu-Topper RM

In the IP address identifies the physical network to which the computer is attached.

Prefix

Suffix

Mux

Question No:22

(Marks:1)

Vu-Topper RM

In Cyclic Redundancy Checking, CRC is _____.

Divisor

Quotient

Remainder

page 20

Question No:23

(Marks:1)

Vu-Topper RM

The satellite or radio topology in which all computers are connected to each other via satellite or radio wave is a kind of

Broadcast network

page 5

Point-to-Point network

Question No:24

(Marks:1)

Vu-Topper RM

Which of the following two operations are performed by Ethernet CD?

I. It monitors outgoing signals.

II. Grabbled signal is interpreted as a collision.

III. Signals are sent back to the sender.

I and III

II and IV

I and II

page 28

Question No:25

(Marks:1)

Vu-Topper RM

The process of forwarding a packet is called _____.

Routing

page 58

Processing

Hierarchical Addressing

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Question No:26

(Marks:1)

Vu-Topper RM

Which statement is correct about Network Interface Card (NIC)?

I. NIC contains sufficient hardware to process data independent of system CPU

II. NIC looks like any other I/O device to system CPU

III. NIC also receives interrupt on incoming data.

I and II

II and III

All of the given options

page 40

Question No:27

(Marks:1)

Vu-Topper RM

While transmitting data from source A to destination B, 4 bits are changed during the transmission then the error is a _____.

Burst error **page 22**

Single error

Double error

Question No:28

(Marks:1)

Vu-Topper RM

The switch that has no attached computers is called _____.

Packet Switch

Exterior Switch

Interior Switch **page 59**

Question No:29

(Marks:1)

Vu-Topper RM

_____ is the most popular wiring scheme because of lowest cost.

5 Base T

10 Base T **page 43**

100 base T

Question No:30

(Marks:1)

Vu-Topper RM

In _____ technique, all members of the network can send data only on the specific time slot?

CDMA

FDMA

CSMA **page 43**

Question No:31

(Marks:1)

Vu-Topper RM

The _____ of errors is difficult than the _____ of errors.

correction; detection

google

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Question No:32**(Marks:1)****Vu-Topper RM**

If a sender with a 100 Megabit NIC and receiver with 10 Megabit NIC wants to communicate with each other at which speed they can communicate?

100 Megabit**page 40****Question No:33****(Marks:1)****Vu-Topper RM**

Missing _____ in a frame format indicates receiving computer missed beginning of the message.

eot

sot

soh**page 16****Question No:34****(Marks:1)****Vu-Topper RM**

Source Independence phenomenon allows fast and efficient _____.

Source Addressing

Routing

Packet Switching**page 58****Question No:35****(Marks:1)****Vu-Topper RM**

In distributed route computation process each packet switch computes its routing table locally and sends messages to the _____.

Router

Graph

Neighbors page 63**Question No:36****(Marks:1)****Vu-Topper RM**

The ____ layer of the OSI model takes the data from the physical layer and perform error checking.

Transport

Data link google

Application

Question No:37**(Marks:1)****Vu-Topper RM**

CBR stands for _____.

Constant Byte Rate

Constant Bit Rate

Constant Borrow Rate

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Question No:38**(Marks:1)****Vu-Topper RM**

A network that uses _____ usually consist of a single long cable to which computer attach.

Star Topology

Ring Topology

Bus Topology **page 26**

Question No:39**(Marks:1)****Vu-Topper RM**

If simultaneous transmission occurs, the frames interfere with each other and this phenomenon is called _____.

packet loss

collision **page 28**

delayed transmission

Question No:40**(Marks:1)****Vu-Topper RM**

In _____ all computers are attached to a central hub

Ring topology

Star topology **page 31**

Hub topology

Question No:41**(Marks:1)****Vu-Topper RM**

For adding a new computer in a point to point network _____ new connection will be required

N

N-1 **page 23**

N-2

Question No:42**(Marks:1)****Vu-Topper RM**

The fastest Ethernet hardware operates at a rate of _____

1000 bps

100 Mbps **page 27**

10 Mbps

Question No:43**(Marks:1)****Vu-Topper RM**

Which of the following the benefit to point to point communication?

Quick to configure.

Security implementation **page 23**

Cost

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Question No:44 (Marks:1)

Vu-Topper RM

ATM offers _____speed and _____delay

High, High

High, low page 72

Low, low

Question No:45 (Marks:1)

Vu-Topper RM

Thick Ethernet is known as _____

10 Base 2

10 Base 5 google

10 Base T

Question No:46 (Marks:1)

Vu-Topper RM

Both interior and exterior switches _____packet and they also need routing tables.

Create

Delay

Forward page 59

Question No:47 (Marks:1)

Vu-Topper RM

_____is the rate at which data can be sent through the network

Throughput page 79

Propagation delay

Access delay

Question No:48 (Marks:1)

Vu-Topper RM

In a ping command, small –sized information packets of _____are sent.

TCP

UDP

ICMP page 11

Question No:49 (Marks:1)

Vu-Topper RM

Many WANs use _____addressing of efficiency

Sequence

Hierarchical page 56

Question No:50 (Marks:1)

Vu-Topper RM

Which of the following is not a function of ping commands?

Relay nodes page 11

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:51

(Marks:1)

Vu-Topper RM

Packet switched can be linked together to form a _____

LAN

WAN page 56

Bridge

Question No:52

(Marks:1)

Vu-Topper RM

Fixed network is a type of network which is classified with respect to the factor

Size

Connectivity

Mobility page 6

Question No:53

(Marks:1)

Vu-Topper RM

Parity bit can detect _____error(s)

4

3

2 page 19

Question No:54

(Marks:1)

Vu-Topper RM

When we will try to connect to the internet which of the following protocol will be used?

Telnet

TCP/IP page 84

ICMP

Question No:55

(Marks:1)

Vu-Topper RM

How many computers are mandatory to form a network?

1

2 google

4

Question No:56

(Marks:1)

Vu-Topper RM

_____ is standard wireless LAN that uses radio signals at 2.4GHz.

IEEE 803.16

IEEE 802.15

IEEE 802.11 page 29

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:57

(Marks:1)

Vu-Topper RM

LAN interface hardware obeys _____ access rule.

CSMA/CD page 34

Round ro

Question No:58

(Marks:1)

Vu-Topper RM

The most important task a bridge performs is _____.

Packet switching

Line controlling

Frame filtering page 50

Question No:59

(Marks:1)

Vu-Topper RM

ATM uses small, fixed-sized packets called cells and each cell has _____ octets.

47

52

53 page 66

Question No:60

(Marks:1)

Vu-Topper RM

_____ can't be guaranteed with variable length packets as easily as it can with fixed length cells.

Errors

Noise

None of the given page 72

Question No:61

(Marks:1)

Vu-Topper RM

Which multiplexing technique transmits digital signals?

WDM

FDM

TDM page 15

Question No:62

(Marks:1)

Vu-Topper RM

Connections in Asynchronous transfer mode are called _____.

Virtual channels page 67

Virtual Path Identifier

Question No:63

(Marks:1)

Vu-Topper RM

A ____ is a device that combines multiple signals and forwards into a single line.

Modem

Multiplexer page 41

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:64

(Marks:1)

Vu-Topper RM

_____ is inflexible.

Routing

Searching

Static routing **page 62**

Question No:65

(Marks:1)

Vu-Topper RM

If a hub is used to connect many computers in a LAN, then only _____
computers can communicate at a given time.

Three

Two **page 54**

Four

Question No:66

(Marks:1)

Vu-Topper RM

_____ is the term used for variance in transmission delays.

Friction

Segment

Jitter **page 66**

Question No:67

(Marks:1)

Vu-Topper RM

_____ is also called self healing network.

ATM

FDDI

Frame relay **page 46**

Question No:68

(Marks:1)

Vu-Topper RM

_____ and _____ are the two frame types.

Internal and external

Single and dual

Multicast and broadcast **page 35**

Question No:69

(Marks:1)

Vu-Topper RM

Bluetooth uses shared medium and _____ instead of coaxial cable.

Radio waves **page 29**

Infrared waves

Question No:70

(Marks:1)

Vu-Topper RM

Which of the following is not a guided medium?

Atmosphere **google**

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:71

(Marks:1)

Vu-Topper RM

As a result of ARPA research, the first network was established which was named as _____.

INTERNETWORKING

ARPNET

ARPANET **page 9**

Question No:72

(Marks:1)

Vu-Topper RM

Asynchronous transfer mode (ATM) can dynamically establish a _____.

Switched virtual circuit **page 70**

Virtual connection identifier

Virtual path indicator

Question No:73

(Marks:1)

Vu-Topper RM

A typical port on an ATM switch operates at _____ or _____ higher.

OC-2 speed (155Gbps)

OC-2 speed (1000Mbps)

OC-3 speed (155Mbps) **page 72**

Question No:74

(Marks:1)

Vu-Topper RM

10Base-T Ethernet is often called a _____.

ring shaped star

ring shaped bus

star shaped bus **page 46**

Question No:75

(Marks:1)

Vu-Topper RM

_____ allows automatic updates.

Dynamic routing **page 62**

Static routing

Routing

Question No:76

(Marks:1)

Vu-Topper RM

Handling variable length packets leads to memory _____.

Fragmentation **page 72**

Management

Question No:77

(Marks:1)

Vu-Topper RM

In order to forward a copy of frame, the bridge uses _____ address.

Destination **page 51**

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:78

(Marks:1)

Vu-Topper RM

We may use _____ to extend local area network.

Bridge, Router

Bridge, Hub, Router

Bridge, Hub, Repeater **page 149**

Question No:79

(Marks:1)

Vu-Topper RM

All of the given options are the types of delay except _____.

Propagation

Access

Throughput **page 79**

Question No:80

(Marks:1)

Vu-Topper RM

While computing shortest path in a graph, next hop information is inserted into _____.

Routing table **page 62**

Trailer

Header

Question No:81

(Marks:1)

Vu-Topper RM

LAN interface uses _____ to copy frame data directly from main memory

DMA **page 34**

FDDI

Hard disk

Question No:82

(Marks:1)

Vu-Topper RM

The Gigabit Ethernet hardware operates at a rate of _____.

10 Mbps

100 Mbps

1000 Mbps **page 263**

Question No:83

(Marks:1)

Vu-Topper RM

In the early resource sharing era, which resources were shared among users?

Computation **page 9**

Floppy Drives

Hard Disk

Ethernet modem

Question No:84

(Marks:1)

Vu-Topper RM

If two buildings are located far from each other then bridge, and _____ can be used to connect two LAN.

Optical fiber

page 51

Question No:85

(Marks:1)

Vu-Topper RM

Which type of network consists of wireless connection of laptops in a university classroom?

WAN

MAN

LAN

google

Question No:86

(Marks:1)

Vu-Topper RM

A typical bridge has _____.

One NIC, a CPU a memory and a ROM.

Two NICs, a CPU a memory and a ROM.

page 50

Question No:87

(Marks:1)

Vu-Topper RM

A cache memory, ROM and CPU.

_____ is used for compressed audio and video, where the data rate depends on the level of compression that can be achieved.

Constant Bit Rate

Stable Bit Rate

Variable Bit Rate

page 71

Question No:88

(Marks:1)

Vu-Topper RM

There are _____ types of data stuffing.

1

2 page 17

0

Question No:89

(Marks:1)

Vu-Topper RM

Dijkstra's algorithm can accommodate weights on _____ in graph.

Nodes page62

Edges

Path

Question No:90

(Marks:1)

Vu-Topper RM

_____ masks your IP address.

VPN

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:91**(Marks:1)****Vu-Topper RM**

Static routing computes routing table information at _____ time.

Load

Boot **page 62**

Execute

Question No:92**(Marks:1)****Vu-Topper RM**

In which type of error detection, the arithmetic sum is calculated before and after the transmission of data at both communication ends?

CRC

Parity

Checksum **page 19**

Question No:93**(Marks:1)****Vu-Topper RM**

Computer sends a connection request to the _____ to which it is attached while establishing a switched virtual circuit

Bridge

Switch **page 70**

VPI

Question No:94**(Marks:1)****Vu-Topper RM**

The bridges communicate with each other on the network and use _____ algorithm to decide which bridge will not forward frames if a cycle occurs.

Dijkstra

Shortest path first

Distributed Spanning Tree **page 53**

Question No:95**(Marks:1)****Vu-Topper RM**

Ethernet uses a _____ bit static addressing scheme in which each device is assigned a unique address by the manufacturer.

64

48

32

Question No:96**(Marks:1)****Vu-Topper RM**

Weights on graph edges reflect cost of _____.

Nodes

Traversing edge **page 63**

Trending edge

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:97

(Marks:1)

Vu-Topper RM

A _____ relies on the hardware manufacturer to assign a unique physical address to each network interface.

Static addressing scheme page 34

Configurable addressing scheme

Dynamic addressing scheme

Question No:98

(Marks:1)

Vu-Topper RM

In _____ topology, if the switch goes down all the computers will be disconnected.

Star

Ring

Bus

Question No:99

(Marks:1)

Vu-Topper RM

Which type of network consists of wired computers in a university classroom?

MAN

PAN

LAN

Question No:100

(Marks:1)

Vu-Topper RM

If you as a network administrator want to know the traffic flow of your data while communicating with a remote computer which of the following will be used to know about intermediate routers?

Ipconfig

Ping page 11

Traceroute

Question No:101

(Marks:1)

Vu-Topper RM

Hardware address is also called _____.

Physical address

Logical address

IP address

Question No:102

(Marks:1)

Vu-Topper RM

Thick Ethernet also requires _____ to avoid signal reflectance.

Transceivers

AUI cable

Terminators page 41

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:103

(Marks:1)

Vu-Topper RM

Which of the following network is using the TCP/IP model globally?

PAN

SAN

The Internet

Question No:104

(Marks:1)

Vu-Topper RM

VPNs connections are sometimes called _____.

Tunnels **page 75**

Open networking

Routing

Question No:105

(Marks:1)

Vu-Topper RM

To reduce _____ computers can be connected and distributed to a number of hubs, then the hubs can be connected to a switch.

Costs **page 54**

Quality

Efficiency

Question No:106

(Marks:1)

Vu-Topper RM

If a _____ is used the communication between two computers will not affect the other pair of computers and they can communicate at the same time

Hub

Switch **page 54**

Repeater

Question No:107

(Marks:1)

Vu-Topper RM

The length of hardware address is _____.

One to ten bytes

One to five bytes

One to six bytes **page 34**

Question No:108

(Marks:1)

Vu-Topper RM

A network analyzer is also called _____.

Network manager

Network administrator

Network monitor **page 37**

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:109

(Marks:1)

Vu-Topper RM

No any error detection scheme is perfect because transmission errors can affect _____.

Data

Additional Information

Additional information & data google

Question No:110

(Marks:1)

Vu-Topper RM

The token ring network topology is a ring but wiring topology is a _____.

Star page 44

bus

tree

Question No:111

(Marks:1)

Vu-Topper RM

_____ addresses are used in an ethernet frame.

IP page 99

Port

Logical

Question No:112

(Marks:1)

Vu-Topper RM

AUI cable connects from NIC to _____.

BNC Connector

RJ-45 Connector

Transceiver page 41

Question No:113

(Marks:1)

Vu-Topper RM

Public networks are _____.

More secure than LAN

Flexible page 74

Limited in boundary

Question No:114

(Marks:1)

Vu-Topper RM

The maximum cable length of a LAN is fixed because _____.

Additional hardware are not suitable for the LAN extension.

The electrical signal level gets weaker as it travels. Page 48

Question No:115

(Marks:1)

Vu-Topper RM

In _____ network topology is separated from route computation.

Link-state routing page 64

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:116

(Marks:1)

Vu-Topper RM

Which layer of the OSI Model directly communicates and controls the transmission medium:

Transmission

Physical

Network

Question No:117

(Marks:1)

Vu-Topper RM

A network with _____ jitter takes more time to deliver some packets than others.

Zero

High **page 80**

Low

Question No:118

(Marks:1)

Vu-Topper RM

A network uses _____ to arrange computers in a single closed loop.

Star Topology

Mesh Topology

Ring Topology **page 25**

Question No:119

(Marks:1)

Vu-Topper RM

Which of the following tasks is not done by the second layer of the OSI model?

Flow control

Framing

Channel coding **google**

Question No:120

(Marks:1)

Vu-Topper RM

ATM is a single technology designed to meet the goals of both _____ and _____.

LAN & PAN

LAN & WAN **page 66**

LAN & MAN

Question No:121

(Marks:1)

Vu-Topper RM

LAN and WAN are classified according to their _____.

Size **page 4**

Connectivity

Medium

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:122

(Marks:1)

Vu-Topper RM

The identifier that is used for data transfer in the virtual circuit network is called _____.

Virtual circuit identifier

Global address

Network identifier

Question No:123

(Marks:1)

Vu-Topper RM

In Direct point to point communication adding the Nth computer requires_____ new connections

N^2

$(N^2 - N)/2$ **page 23**

$N(N-1)$

Question No:124

(Marks:1)

Vu-Topper RM

Which of the following is the correct function of bridge?

MTU path discovery

Byte stuffing

Filtering and forwarding a frame **page 50, 51**

Question No:125

(Marks:1)

Vu-Topper RM

Point to point topology is

Size based

Mobility based

Connectivity based **page 5**

Question No:126

(Marks:1)

Vu-Topper RM

IEEE LLC / SNAP header is _____ which is used to specify the type of data.

8 octets **google**

16 octets

32 octets

Question No:127

(Marks:1)

Vu-Topper RM

What is the largest network in existence?

The internet **google**

A PAN

A Fog

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:128

(Marks:1)

Vu-Topper RM

The frame format of any LAN technology must consists of ____ and ____ -

Payload and CRC

Frame header and CRC

Frame header and payload **page 36**

Question No:129

(Marks:1)

Vu-Topper RM

_____ can occur a LANs when a packet is delayed because the network is busy

Jitter **page 66**

Loop

Deadlock

Question No:130

(Marks:1)

Vu-Topper RM

Which of the following cannot be used to extend a LAN?

Repeaters

Switches

Fiber modems

Question No:131

(Marks:1)

Vu-Topper RM

Links-state algorithm is used in _____

RIP

IGRP

OSPF **page 64**

Question No:132

(Marks:1)

Vu-Topper RM

According to size, there are ____ classifications of networks

2 **page 2**

3

4

Question No:133

(Marks:1)

Vu-Topper RM

In which topology terminators are used at the end of the cable?

Star

Bus

Question No:134

(Marks:1)

Vu-Topper RM

Switch simulates a _____ LAN connecting segments

Bridged **page 54**

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:135

(Marks:1)

Vu-Topper RM

PVS stands for _____

Permanent virtual circuit **page 69**

Private virtual circuit

Public virtual circuit

Question No:136

(Marks:1)

Vu-Topper RM

Hardware that calculates a CRC used two simple components _____

AND unit and XOR Unit

Shift register and XOR unit **page 20**

Shift register & AND unit

Question No:137

(Marks:1)

Vu-Topper RM

Thin ethernet is known as _____

10 base 2 **google**

10 base 5

10 base T

Question No:137

(Marks:1)

Vu-Topper RM

If a sender with a 1 Gigabit NIC and receiver with 100 Megabit NIC wants to communicate with each other than at which speed they can communicate

11 Megabit

100 Megabit

1 Gigabit

Question No:138

(Marks:1)

Vu-Topper RM

_____ is used as an alternative of packet for a specific computer network technology

Datum

Token

Frame **page 14**

Question No:139

(Marks:1)

Vu-Topper RM

The sharing of a medium and its link by two or more devices is called _____

Modulation

Encoding

Multiplexing

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:140

(Marks:1)

Vu-Topper RM

The topology each computer is connected to a central hub is called

Ring topology

Star topology **page 5**

Tree topology

Question No:141

(Marks:1)

Vu-Topper RM

Asynchronous transfer mode (ATM) is designed to work on fiber but can be used with _____

Wireless

Twisted pair **page 72**

Wifi

Question No:142

(Marks:1)

Vu-Topper RM

The basic responsibility of NIC is _____

To access medium network

To resource allocation

To access memory

Question No:143

(Marks:1)

Vu-Topper RM

Frame relay is _____

Connection oriented service **page 64**

Connectionless service

Typically ranges for 5 Mbps to 1000Mbps

Question No:144

(Marks:1)

Vu-Topper RM

The length of time required to send a variable length packet is _____

5 second

Variable **page 72**

Constant

Question No:145

(Marks:1)

Vu-Topper RM

In Token Ring, if all computers are ready to transmit it enforces _____ Access

First come first served

Round Robin **page 30**

Question No:146

(Marks:1)

Vu-Topper RM

The Ethernet standard specifies that frames are sent using the _____ scheme.

Manchester Encoding **page 27**

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:147 (Marks:1)

Vu-Topper RM

ATM uses the concept of _____.

Connection-oriented page 66

Connection-less

Variable packet size

Question No:148 (Marks:1)

Vu-Topper RM

Which of the following is a benefit of point to point communication?

Quick to configure

Security implementation

Less availability

Question No:149 (Marks:1)

Vu-Topper RM

_____ is not used to extend LAN.

Hub

Fiber modem

Repeater

Question No:150 (Marks:1)

Vu-Topper RM

Which types of VPNs are used for corporate connectivity across companies residing in different geographical locations?

Remote access VPNs

Peer-to-peer VPNs

Site-to-site VPNs google

Question No:151 (Marks:1)

Vu-Topper RM

Star topology is the kind of

Tree topology

Point-to-point topology page 05

Broadcast topology

Question No:152 (Marks:1)

Vu-Topper RM

In a _____ state, a bridge allows simultaneous use of each segment.

Ready

Steady

Question No:153 (Marks:1)

Vu-Topper RM

The network occupies larger areas like cities & countries is called

WAN

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:154

(Marks:1)

Vu-Topper RM

In link state routing _____ send link-state information about local connections.

Bridge

Switches

Hubs

Question No:155

(Marks:1)

Vu-Topper RM

Transmission media are usually categorized as _____.

Guided or unguided

Fixed or unfixed

Determinate or indeterminate

Question No:156

(Marks:1)

Vu-Topper RM

Even parity can be used to check for _____ bit/ bits of errors.

1 page 18

2

3

Question No:157

(Marks:1)

Vu-Topper RM

Routing table entries can be _____ with a default route.

Collapsed

Redirected

Emerged

Question No:158

(Marks:1)

Vu-Topper RM

The system administrator must coordinate to avoid the conflict in _____ hardware addressing scheme.

Static

Dynamic

Configurable

Question No:159

(Marks:1)

Vu-Topper RM

_____ network does not depend on CSMA/CD.

Ethernet

Fast Ethernet

Gigabit Ethernet

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Question No:160

(Marks:1)

Vu-Topper RM

Which of the following technologies can extend the diameter of LAN medium?

Fiber optic

Repeater

Both. Fiber optic and Repeaters

Question No:161

(Marks:1)

Vu-Topper RM

Connections are formed in Asynchronous transfer mode by starting values in _____ in ATM switches, as opposed to making actual electrical connections.

Heap

Stack

Memory locations page 67

Question No:162

(Marks:1)

Vu-Topper RM

The _____ scheme must be reliable to prevent conflicts.

Static

Dynamic page 34

Configurable

Question No:163

(Marks:1)

Vu-Topper RM

Metropolitan area network is used for _____.

City page 55

Building

Country

Question No:164

(Marks:1)

Vu-Topper RM

Which addressing can be only used in the local area networks?

IP google

Physical

Port

Question No:165

(Marks:1)

Vu-Topper RM

The sharing of a _____ among the workers in an office is a goal of resource sharing.

Mouse

Printer page 9

Keyboard

For More Help Vu-Topper RM Contact What's app 03224021365

Question No:166

(Marks:1)

Vu-Topper RM

ATM uses fixed size, small cells, 48 octet's data and _____.

Octets header

5 Octets header page 65

6 Octets header

Question No:167

(Marks:1)

Vu-Topper RM

Which of the followings is not an advantage of framing?

Missing eot indicates sending computer crashed.

Missing soh indicates receiving computer missed beginning of message.

Delimiters do not contain any user data page 16

Question No:168

(Marks:1)

Vu-Topper RM

The _____ field of Ethernet frame has the purpose of receiver synchronization.

Preamble page 36

Frame Type

Data

Question No:169

(Marks:1)

Vu-Topper RM

_____ was the first internet available for the first time.

ARPANAT

ARPANET page 9

Question No:170

(Marks:1)

Vu-Topper RM

We need packets rather than bits because _____

To compress the data

Sender and receiver need to coordinate to detect transmission errors. Page 14

Question No:171

(Marks:1)

Vu-Topper RM

When an application _____ any data, it makes a copy of the data available to all other computers on the network.

Multicast page 143

Broadcast

Question No:172

(Marks:1)

Vu-Topper RM

VBR stands for _____

Virtual Bit Rate

Variable Bit Rate page 71

For More Help Vu-Topper RM Contact What's app 03224021365



CS610- Computer Network

Solved MCQS
From Midterm Papers

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CS610- Computer Network MIDTERM EXAMINATION Spring 2010

Question No: 1 (M a r k s : 1)

No error detection scheme is perfect because transmission errors can affect the additional information as well as the data.

► True (Computer Networks and Internets, page82)

► False

Question No: 2 (M a r k s : 1)

----- Program sends a message to a remote computer and reports whether the computer responds.

► Ping (Computer Networks and Internets, page9)

► Traceroute

► ICMP

► Non of the given

Question No: 3 (M a r k s : 1)

----- was especially concerned about the lack of high powered computers.

► ARPA (Computer Networks and Internets, page5)

► IEEE

► EIA

► Non of the given

Question No: 4 (M a r k s : 1)

The term ----- is used to denote the definition of a packet used with a specific type of network.

► Packet

► Frame (Computer Networks and Internets, page 73)

► Data

► None of the given

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Question No: 5 (M a r k s: 1)

Computer networks are often called ----- because they use packet technology.

- ▶ Ethernet
- ▶ Switch networks
- ▶ [Packet networks](#) (Computer Networks and Internets, page 73)
- ▶ None of the given

Question No: 6 (M a r k s: 1)

----- have advantages arisen from the size and ease of computation.

- ▶ CRC
- ▶ [Parity](#) (Page 19)
- ▶ Checksums
- ▶ None of given

Question No: 7 (M a r k s: 1)

Most LANs that employ ring topology use an access mechanism known as-----

- ▶ CSMA/CD
- ▶ CSMA/CA
- ▶ [TOKEN PASSING](#) (Computer Networks and Internets, page95)
- ▶ None of the given

Question No: 8 (M a r k s: 1)

IEEE LLC/SNAP header is -----, which is used to specify the type of data.

- ▶ [8 octets](#) (Computer Networks and Internets, page112)
- ▶ 8 bytes
- ▶ 8 bits
- ▶ None of the given

Question No: 9 (M a r k s: 1)

Formally named _____ informally known as the twisted pair Ethernet or TP Ethernet.

- ▶ 10 Base 2
- ▶ 10 Base 5
- ▶ [10 Base T](#) (Page 43)
- ▶ None of the given

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Question No: 10 (M a r k s: 1)

An interface for twisted pair Ethernet must have an _____ connector , and must generate signals according to the _____ specification.

▶ [RJ-45, 10 Base T](#) (Computer Networks and Internets, page 126)

- ▶ RJ-45, 10 Base 5
- ▶ BNC, 10 Base 2
- ▶ BNC, 10 Base T

Question No: 11 (M a r k s: 1)

A bridges function in the _____ layers(s).

▶ [Physical \(MAC\)](#) [Click here for Detail](#)

- ▶ Data link
- ▶ Network
- ▶ Physical (MAC) and Data link

Question No: 12 (M a r k s: 1)

A Bridge can _____

- ▶ Filter a frame
- ▶ Forward a frame
- ▶ Extend a LAN

▶ [Do all the above](#) [Click here for Detail](#)

Question No: 13 (M a r k s: 1)

A Bridge forwards or filters a frame by comparing the information in its address table to the frame's _____

- ▶ Layer 2 source address
- ▶ Source node's physical address

▶ [Layer 2 destination address](#) [Click here for Detail](#)

- ▶ Layer 3 destination address

Question No: 14 (M a r k s: 1)

_____ computes shortest paths in a graph by using weights on edges as a measure of distance.

- ▶ Greedy algorithm
- ▶ Distance vector algorithm

▶ [Dijkstra's algorithm](#) (Computer Networks and Internets, page112)

- ▶ Non of the given

Question No: 15 (M a r k s: 1)

_____ is used for audio and video, since these have predefined maximum data rates

► **Constant Bit Rate (CBR) service** (Page 71)

- Variable Bit Rate (VBR) service
- Available Bit Rate (ABR) service
- None of the given

Question No: 16 (M a r k s: 1)

Unlike Frame Relay and ATM, SMDS (Switched multi-megabit Data service) offers_____ .

► **Connectionless service paradigm** (Computer Networks and Internets, page112)

- Connection oriented service paradigm
- Both Connectionless and Connection-oriented service paradigm
- None of the given

Question No: 17 (M a r k s: 1)

A network with throughput T and delay D has a total of _____ bit in transit at any time.

- T / D

► **T x D** (Computer Networks and Internets, page203)

- T + D
- None of the given

Question No: 18 (M a r k s: 1)

ATM is designed to work on_____.

- Twisted Pair
- Coaxial
- Radio Frequency

► **Fiber** (Computer Networks and Internets, page 72)

Question No: 19 (M a r k s: 1)

Computers attached to an Ethernet use ----- in which a computer waits for the ether to be idle before transmitting a frame.

► **CSMA/CD** (Computer Networks and Internets, page 93)

- CSMA/CA
- TOKEN PASSING
- None of the given

Question No: 20 (M a r k s: 1)

FDDI can transmits data at a rate of -----

▶ **100 million bits per second** (Page 314)

- ▶ 10 million bits per second
- ▶ 1000 million bits per second
- ▶ None of the given

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Question No: 1 (M a r k s: 1)

In Point-to-Point topology there are two topologies.

- ▶ Star and Tree
- ▶ Tree and Ring
- ▶ Star and Ring

▶ **Star and Tree** (Page 5)

- ▶ None of the given

Question No: 2 (M a r k s: 1)

----- Program sends a message to a remote computer and reports whether the computer responds.

▶ **Ping** (Computer Networks and Internets, page9)

- ▶ Traceroute
- ▶ ICMP
- ▶ Non of the given

Question No: 3 (M a r k s: 1)

----- has no way to determine the cause of the problem.

- ▶ ICMP

▶ **Ping** (Computer Networks and Internets, page 11)

- ▶ Trace route
- ▶ Non of the given

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Question No: 4 (M a r k s: 1)

The term----- refers to the general concept of a small block of data

► **Packet** (Page 16)

- Frame
- Data
- None of the given

Question No: 5 (M a r k s: 1)

----- scheme, which is designed to help detect transmissions errors, send one extra bit of information with each character

► **Parity** (Computer Networks and Internets, page 77)

- Checksums
- CRC
- None of given

Question No: 6 (M a r k s: 1)

Local Talk is a LAN technology that employs -----

► **Bus topology** (Page 30)

- Ring topology
- Star topology
- None of the given

Question No: 7 (M a r k s: 1)

Most LANs that employ ring topology use an access mechanism known as-----

- CSMA/CD
- CSMA/CA

► **TOKEN PASSING** (Computer Networks and Internets, page95) rep

- None of the given

Question No: 8 (M a r k s: 1)

Ethernet uses a ----- bit static addressing scheme in which each device is assigned a unique address by the manufacturer.

- 64

► **48** (Computer Networks and Internets, page 109)

- 32
- 8

Question No: 9 (M a r k s: 1)

Formally named _____ informally known as the thick wire Ethernet or Thick net.

- ▶ 10 Base 2
- ▶ [10 Base 5](#) **Computer Networks and Internets, page 120)**
- ▶ 10 Base T
- ▶ None of the given

Question No: 10 (M a r k s: 1)

Formally named _____ informally known as the twisted pair Ethernet or TP Ethernet.

- ▶ 10 Base 2
- ▶ 10 Base 5
- ▶ [10 Base T](#) **(Page 43) rep**
- ▶ None of the given

Question No: 11 (M a r k s: 1)

The maximum size of an Ethernet segment is _____

- ▶ 250 meters
- ▶ [500 meters](#) **(Page 27)**
- ▶ 700 meters
- ▶ None of the given

Question No: 12 (M a r k s: 1)

A Bridge can _____

- ▶ Filter a frame
- ▶ Forward a frame
- ▶ Extend a LAN
- ▶ [Do all the above](#) **rep** [Click here For Detail](#)

Question No: 13 (M a r k s: 1)

_____ computes shortest paths in a graph by using weights on edges as a measure of distance.

- ▶ Greedy algorithm
- ▶ Distance vector algorithm
- ▶ [Dijkstra's algorithm](#) **(Computer Networks and Internets, page112) rep**
- ▶ Non of the given

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Question No: 14 (M a r k s: 1)

_____ is used for compressed audio and video where the data rate depends on the level of compression that can be achieved.

- ▶ Constant Bit Rate (CBR) service
- ▶ [Variable Bit Rate \(VBR\) service](#) (Page 71)
- ▶ Available Bit Rate (ABR) service
- ▶ None of the given

Question No: 15 (M a r k s: 1)

Basic LAN technologies such as Ethernet, Token Ring, and FDDI use a _____.

- ▶ [Connectionless service paradigm](#) (Computer Networks and Internets, page112)
- ▶ Connection-oriented service paradigm
- ▶ Both Connectionless and Connection-oriented service paradigm
- ▶ None of the given

Question No: 16 (M a r k s: 1)

The product of delay and throughput measures the _____ of data that can be present on the network.

- ▶ Area
- ▶ [Volume](#) (Page 80)
- ▶ Length
- ▶ None of the given

Question No: 17 (M a r k s: 1)

A network with throughput T and delay D has a total of _____ bit in transit at any time.

- ▶ T / D
- ▶ [T x D](#) (Computer Networks and Internets, page203) rep
- ▶ $T + D$
- ▶ None of the given

Question No: 18 (M a r k s: 1)

One repeater _____, two repeaters _____ the maximum cable length limitation.

- ▶ [doubles, triple](#) (Page 49)
- ▶ square roots, cube roots
- ▶ and, triple
- ▶ doubles, cancel

Question No: 19 (Marks: 1)

A network uses a ----- if all computers attach to a central point

► **Star Topology** (Page 25)

- Ring Topology
- Bus Topology
- None of the given

Question No: 20 (Marks: 1)

Computers attached to an Ethernet use ----- in which a computer waits for the other to be idle before transmitting a frame.

► **CSMA/CD** (Computer Networks and Internets, page 93) rep

- CSMA/CA
- TOKEN PASSING
- None of the given

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Question No: 1 (Marks: 1) - Please choose one

A typical port on an ATM switch operates at _____ or higher.

- OC-2 speed (155Mbps)
- OC-3 speed (100Mbps)

► **OC-3 speed (155Mbps)** (Page 72)

- OC-3 speed (155Gbps)

Question No: 2 (Marks: 1) - Please choose one

The product of delay and throughput measures the _____ of data that can be present on the network.

- Area

► **Volume** (Page 80) rep

- Length
- None of the given

Question No: 3 (Marks: 1) - Please choose one

_____ is used for compressed audio and video where the data rate depends on the level of compression that can be achieved.

- Constant Bit Rate (CBR) service

► **Variable Bit Rate (VBR) service** (Page 71) rep

- Available Bit Rate (ABR) service
- None of the given

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Question No: 4 (Marks: 1) - Please choose one

Which of the following is a connecting device?

- ▶ Bridge
- ▶ Repeater
- ▶ Hub

▶ [All the given](#) [Click here for Detail](#)

Question No: 5 (Marks: 1) - Please choose one

A bridges function in the _____ layers(s).

▶ [Physical \(MAC\)](#) rep [Click here for Detail](#)

- ▶ Data link
- ▶ Network
- ▶ Physical (MAC) and Data link

Question No: 6 (Marks: 1) - Please choose one

IEEE LLC/SNAP header is -----, which is used to specify the type of data.

▶ [8 octets](#) (Computer Networks and Internets, page112) rep

- ▶ 8 bytes
- ▶ 8 bits
- ▶ None of the given

Question No: 7 (Marks: 1) - Please choose one

The third field of the header consists of ----- bit Ethernet frame type.

- ▶ 48
- ▶ 32

▶ [16](#) (Computer Networks and Internets, page110)

- ▶ 8

Question No: 8 (Marks: 1) - Please choose one

An -----method, the network hardware designers specify how type information is included in the frame and the value use to identify various frame types.

▶ [Explicit frame type](#) (Page 35)

- ▶ Ideal frame type
- ▶ Implicit frame type
- ▶ None of the given

Question No: 9 (Marks: 1) - Please choose one

Local Talk is a LAN technology that employs -----

- ▶ Star topology

▶ [Bus topology](#) (Page 30) rep

- ▶ Ring topology
- ▶ None of the given

Question No: 10 (Marks: 1) - Please choose one

The Fast Ethernet hardware operates at a rate of -----

- ▶ 10 Mbps
- ▶ [100 Mbps](#) (Page 27)
- ▶ 1000 Mbps
- ▶ None of the given

Question No: 11 (Marks: 1) - Please choose one

----- scheme, which is designed to help detect transmissions errors, send one extra bit of information with each character

- ▶ [Parity](#) (Computer Networks and Internets, page 77) rep
- ▶ Checksums
- ▶ CRC
- ▶ None of given

Question No: 12 (Marks: 1) - Please choose one

Computer networks are often called ----- because they use packet technology.

- ▶ Ethernet
- ▶ Switch networks
- ▶ [Packet networks](#) (Computer Networks and Internets, page 73) rep
- ▶ None of the given

Question No: 13 (Marks: 1) - Please choose one

----- Program sends a message to a remote computer and reports whether the computer responds.

- ▶ [Ping](#) (Computer Networks and Internets, page 9) rep
- ▶ Traceroute
- ▶ ICMP
- ▶ Non of the given

Question No: 14 (Marks: 1) - Please choose one

In -----, network occupies larger areas like cities & countries.

- ▶ LAN
- ▶ [WAN](#) (Page 4)
- ▶ MAN
- ▶ None of the given

Question No: 15 (Marks: 1) - Please choose one

In -----, network occupies the smaller area like a room a floor or a building

- ▶ [LAN](#) (Page 4)
- ▶ WAN
- ▶ MAN
- ▶ None of the given

Question No: 16 (Marks: 1) - Please choose one

In Point-to-Point topology there are two topologies.

- ▶ Tree and Ring
- ▶ Star and Ring
- ▶ Star and Tree (Page 5)
- ▶ None of the given

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Question No: 1 (Marks: 1) - Please choose one

_____ has a jitter zero

- ▶ None of the given
- ▶ Virtual Private Network
- ▶ Isochronous Network
- ▶ Asynchronous Network (Page 66)

Question No: 2 (Marks: 1) - Please choose one

Unlike Frame Relay and ATM, SMDS (Switched multi-megabit Data service) offers_____ .

- ▶ Connectionless service paradigm (Computer Networks and Internets, page112)
- ▶ Connection oriented service paradigm
- ▶ Both Connectionless and Connection-oriented service paradigm
- ▶ None of the given

Question No: 3 (Marks: 1) - Please choose one

ATM assigns each VC a _____ identifier that is divided two parts to produce a hierarchy.

- ▶ 21-bit
- ▶ 22-bit
- ▶ 23-bit
- ▶ 24-bit (Page 67)

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Question No: 4 (Marks: 1) - Please choose one

Most WAN systems include a mechanism that can be used to eliminate the common case of duplication routing is called_____

- ▶ Hierarchal address
- ▶ [Default route](#) (Computer Networks and Internets, page172)
- ▶ Shortest path
- ▶ None of the given

Question No: 5 (Marks: 1) - Please choose one

The next hop to which a packet is sent depends only on

- ▶ [Packet's destination](#) (Computer Networks and Internets, page169)
- ▶ Packet's original source
- ▶ Path the packet has taken
- ▶ Non of the given

Question No: 6 (Marks: 1) - Please choose one

An interface for twisted pair Ethernet must have an _____ connector , and must generate signals according to the _____ specification.

- ▶ [RJ-45, 10 Base T](#) (Computer Networks and Internets, page 126) rep
- ▶ RJ-45, 10 Base 5
- ▶ BNC, 10 Base 2
- ▶ BNC, 10 Base T

Question No: 7 (Marks: 1) - Please choose one

When an application----- data, it makes a copy of the data available to all other computers on the network.

- ▶ [Broadcasting](#) [Click here for Detail](#)
- ▶ Multicasting
- ▶ Unicasting
- ▶ None of the given

Question No: 8 (Marks: 1) - Please choose one

A ----- provide a mechanism that a customer can use to set a physical address.

- ▶ Static addressing scheme
- ▶ [Configurable addressing scheme](#) (Page 34)
- ▶ Dynamic addressing scheme
- ▶ None of the given

Question No: 9 (Marks: 1) - Please choose one

FDDI can transmits data at a rate of -----

▶ [100 million bits per second](#) (Page 314) rep

- ▶ 100 million bits per second
- ▶ 100 million bits per second
- ▶ None of the given

Question No: 10 (Marks: 1) - Please choose one

Computers attached to an ether use ----- in which a computer waits for the ether to be idle before transmitting a frame.

▶ [CSMA/CD](#) (Computer Networks and Internets, page 93) rep

- ▶ CSMA/CA
- ▶ TOKEN PASSING
- ▶ None of the given

Question No: 11 (Marks: 1) - Please choose one

----- have advantages arisen from the size and ease of computation.

▶ CRC

▶ [Parity](#) (Page 19) rep

- ▶ Checksums
- ▶ None of given

Question No: 12 (Marks: 1) - Please choose one

The term ----- is used to denote the definition of a packet used with a specific type of network.

▶ Packet

▶ [Frame](#) (Computer Networks and Internets, page 73)

- ▶ Data
- ▶ None of the given

Question No: 13 (Marks: 1) - Please choose one

----- has no way to determine the cause of the problem.

▶ [Ping](#) (Computer Networks and Internets, page 11) rep

- ▶ Trace route
- ▶ ICMP
- ▶ Non of the given

Question No: 14 (Marks: 1) - Please choose one

----- Program sends a message to a remote computer and reports whether the computer responds.

▶ Ping (Computer Networks and Internets, page9) rep

- ▶ Traceroute
- ▶ ICMP
- ▶ Non of the given

Question No: 15 (Marks: 1) - Please choose one

In -----, network occupies the smaller area like a room a floor or a building

▶ LAN (Page 4) rep

- ▶ WAN
- ▶ MAN
- ▶ None of the given

Question No: 16 (Marks: 1) - Please choose one

No error detection scheme is perfect because transmission errors can affect the additional information as well as the data.

▶ True (Computer Networks and Internets, page82)

- ▶ False

Helping Material

Cs610- Computer Networks By Hammad Khalid Khan

Computer Networks and Internets with Internet Applications, 4/e (With CD) By Comer

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