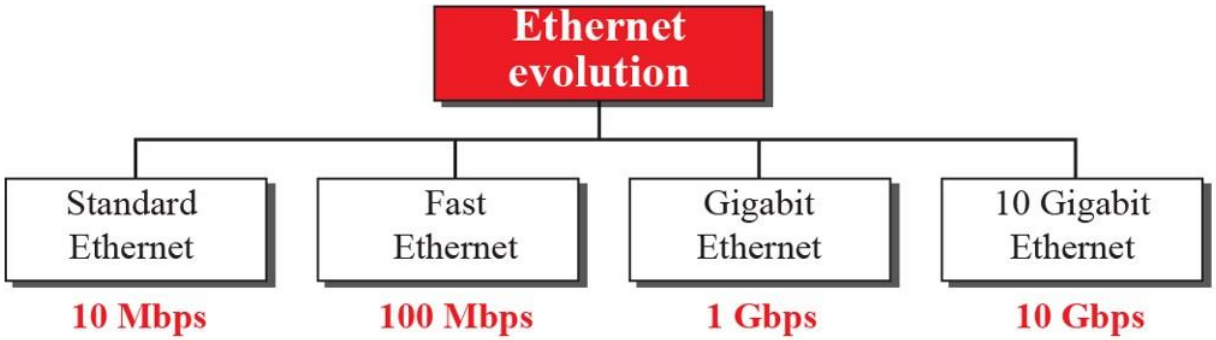
Network Servers and Infrastructure

Assignment 3

Q1: State the Ethernet generations

The Ethernet LAN was developed in the 1970s. Since then, it has gone through four generations: Standard



Q2: Draw the *Ethernet frame* and define its fields

Preamble	SFD	Destination address	Source address	Type	Data and padding	CRC
7 byte	2 byte	6 byte	6 byte	2 byte	min:46 byte max:1500	4 byte

Preamble: This is a pattern of alternative 0's and 1's which indicates starting of the frame and allow sender and receiver to establish bit synchronization

SFD: This is a 1-Byte field which is always set to 10101011

Destination address: MAC address of machine for which data is destined.

Source Address: MAC address of source machine

Type: indicates the length of entire Ethernet frame

Data: This is the place where actual data is inserted, also known as Payload

CRC: This field contains a 32-bits hash code of data

Q3: Define the type of the following destination addresses:

a. **45:30:10:21:10:1A**

   (multicast) because second number is odd

b. **4C:20:1B:2E:08:EE**

   (unicast) because second number C is even

c. **FF:FF:FF:FF:FF:FF**

   (Broadcast)

Q4: Define the flowing terms:

10Base2 [medium + medium Length]

10Base5 [medium + medium Length]

10Base-T [medium + medium Length]

10Base-F [medium + medium Length]

10Base2	Thin coaxial	185m
10Base5	Thick coaxial	500m
10Base-T	2 UTP	100m
10Base-F	2 Fiber	2000

Collision domain:

A section of a network connected by a shared medium or through repeaters where data packets can collide with one another when being sent

Collision:

Superposition of two signals

100Base-TX [medium + medium Length]:

100Base-TX	STP	100m

100Base-FX [medium + medium Length]:

100Base-FX	Fiber	185m

Q5: How the address below is sent out online?

47:20:1B:2E:08:EE

Hex Decimal	**47**	**20**	**1B**	**2E**	**08**	**EE**
Binary	**01000111**	**00100000**	**00011011**	**00101110**	**00001000**	**11101110**
Transmitted	**11100010**	**00000100**	**11011000**	**01110100**	**00010000**	**01110111**

Q6: Compare between LS and DV algorithms

Link State	Distance vector
Security: all messages authenticated	No authentication
multiple same-cost paths allowed	Only one Path
Hierarchical: large- domains	Small-Domains
Use unicast and multicast for update	Use broadcast

Q7: Compare between Inter-As routing and Intra-AS routing using examples

	Performance	Policy	Protocols
INTRA-AS	focus on performance	There is no policy because single admin	RIP OSPF IGPR
INTER-AS	focus on policy	NEED POLICY EX: ADMIN WANTS CONTROL OVER HOW ITS TRAFFIC ROUTED, WHO ROUTES THROUGH ITS NET	BGP (iBGP, eBGP)