Name :- Shubham Dutta

Year : 2nd

Stream :- CST

Enrollment :- 12019009022112

Registration :- 301201900900[redacted]752

Paper Name - Computer Networks

Paper Code :- PCCCS404

Signature :- Shubham Dutta

Date :- 15th March 2021

Answer

1. A) Topology refers to layout of computer network. Physical topology means the placement of the element of network, including ~~location of devices or~~ layout of devices or layout of cables.

Basically there are 5 types of topology:-

a) Ring
b) Bus
c) Star
d) Mesh
e) Tree

In mesh topology, every device is connected to another device via particular channel.

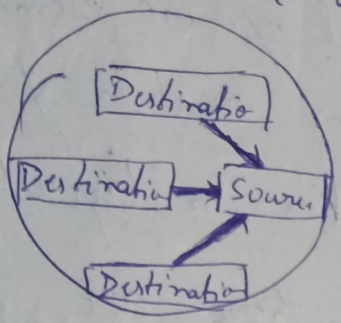
If suppose, N no. of devices are connected to with each other in mesh topology then total no. of ~~ports~~, dedicated links required to connect them is ${}^{N}C_{2}$.

which is equal to $\frac{n(n+1)}{2}$ //

2.6) Limiting Broadcasting

•) In limited broadcasting data, reaches from source to all host in a same network.

•)



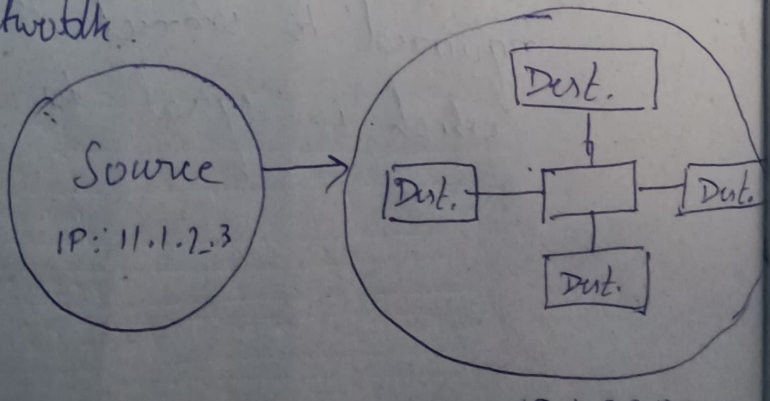
•) Here source will send message to all host connected to it.

•) Limited broadcast destination will remain same 255.255.255.255 for all IP address.

⇒ Directed Broadcast

•) When host in 1 network sends message to all host in another network.

•)



•) Here source sends data to all host of another network.

•) Since network is different so we need to tell about network so directed broadcast address is 20.255.255.255

3. B) i) IP Address : 156.11.129.120

Class :- B

Network IP Address :- 156.11.0.0

Direct broadcast address :- 156.11.255.255

Limited broadcast address :- 255.255.255.255

ii) IP Address : 202.22.15.15

Class :- C

Network IP Address :- 202.22.15.0

Direct Broadcast Address : 202.22.15.225

Limited Broadcast Address : 255.255.255.255

4.b) Difference Between Logical Addressing & Physical Addressing

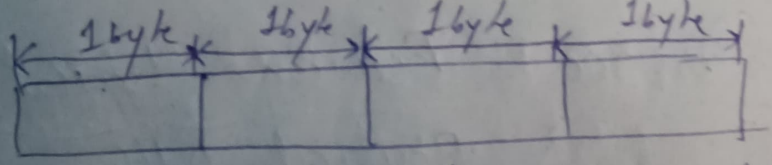
Params	Logical Addressing	Physical Addressing
Basic	Generated by CPU	Location in a memory unit.
Address space	Logical Address Space is set of all logical address generated by CPU in reference to program	Physical address is set of all physical address mapped to corresponding logical address
Generation	Generated by CPU	Computed by MMU

→ Visibility	User can view logical address of program	User can never view physical address of program
→ Access	The user can use logical address to access physical Address	The use can indirectly access physical address but not directly

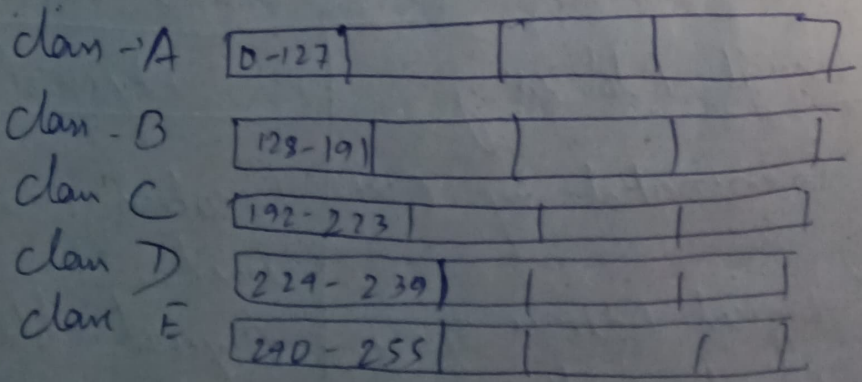
⇒ Classfull Addressing is a concept that divides the available address space of IPV4 into 5 classes namely A, B, C, D, E. IPv4 addresses are represented using 32-bit addresses.

32-bit IPV4 address is also referred to as 4-byte address.

∴ Address space of IPv4 is 2^{32}



32 bit IPv4 Address



Dotted Decimal Notation

5. a)

Params	Connection-oriented Services	Connection-less Serv.
1. Analogy	Connection-oriented Services are similar to Telephone System.	They are similar to postal Syster
2. Usage	They are used in long & steady communication networks	They are used in volatile network
3. Congestion	No Congestion in Connected oriented services.	Congestion is quite possible in here
4. Reliability	They are highly reliable	They is no guaran-tee of reliability
5. Packet Routing	Here, packets follows same route	Here, packets can follow any route.

6. B) i) IP Address: 15.19.29.79

Class : A

Network IP : 15.0.0.0

Direct Broadcast IP : 15.255.255.255

Limited " " : 255.255.255.255

ii) IP Address : 127.10.20.35

Class : loopback address

Network IP : 127.0.0.0

Direct broadcast IP : 127.255.255.254

Limited " " : 255.255.255.255.

---

7. B) Nyquist Sampling Theorem

Nyquist Sampling Th. states that a periodic signal must be sampled at more than twice the highest frequency component of signal.

Because of finite time available a sampling rate somewhat ~~high~~ higher than this is necessary.

→ ATQ,

We need to sample the signal at twice the highest frequency (2 sample per hz)

We know that,

bit-rate = current bandwidth * 2 * sample size

⇒ bit-rate = 8 KHz * 2 * 8bit

⇒ bit-rate = 8K/sec * 2 * 8bit

⇒ bit rate = 128 Kb/sec

∴ bit-rate = 128 Kbps