

#### 4. Explain SNTP Protocol

Simple Network Time Protocol (SNTP) is a simplified version of Network Time Protocol (NTP) that is used to synchronise computer clocks on a network.

- \* The simplified version of NTP is generally used when full implementation of NTP is not needed.
- \* SNTP is a simplified access strategy for servers & clients using NTP.
- \* SNTP synchronises a computer's system time with a server that has already been synchronised by a source such as radio, satellite receiver or modem.
- \* SNTP supports unicast, multicast & anycast operating modes.
- \* In unicast mode, the client sends a request to a dedicated server by referencing its unicast address.
- \* Once a reply is received from the server, the client determines the time, roundtrip delay & local clock offset in reference to the server.
- \* In multicast mode, the server sends an unsolicited message to a dedicated IPv4 or IPv6 local broadcast address.
- \* Generally a multicast client does not send any requests to the service because of service disruption caused by unknown & untrusted multicast servers.
- \* The disruption can be avoided through an access control mechanism that allows

a client to select a designated server he or she knows & trusts

GMT



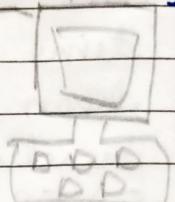
SNTP Server

IP net/  
Internet

Aliilis  
CPX

IP net/  
Internet

SNTP  
client



5. Explain Unicast, Multicast & Broadcast and Anycast & differentiate between them

- \* In computer networks, when we have to send any message to other nodes we first see if the message is intended either for a single node or group of nodes or to all nodes as per needs
- \* Depending on that we use various network traffic or transmission types

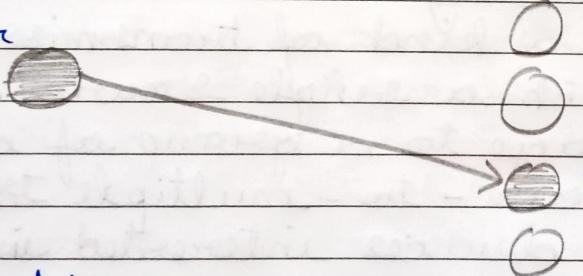
They are

- 1] Unicasting
- 2] Anycasting
- 3] Multicasting
- 4] Broadcasting

## 1) Unicasting

- \* It is the most commonly used data transmission type on the internet
- \* In unicasting, the data traffic flows from a single source node to a single destination node on the network
- \* It is a one-to-one type of data transmission between the sender & receiver
- \* It can be best implemented in computer-to-computer or server-to-server or client-to-server kind of communications
- \* SMTP protocol can be used for unicasting an email on the internet
- \* FTP can be used for unicasting a particular file from 1 computer to another on the network
- \* It is also used in HTTP, Telnet, web surfing & file transfer
- \* It maintains the privacy of info b/w 2 devices

Sender



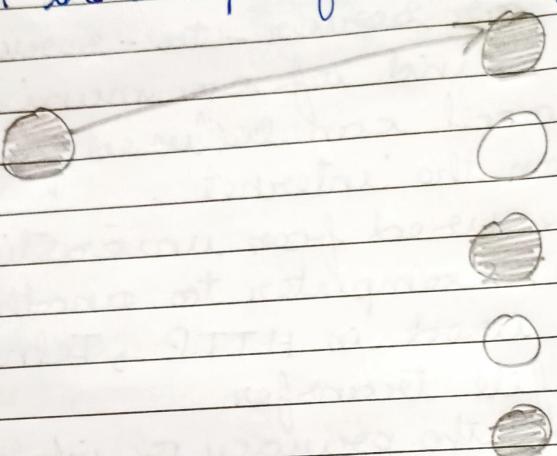
Receiver

## 2) Anycasting

- \* It is a one to nearest kind of transmission in which a single source sends a message to the nearest destination
- \* It can only be implemented using IPV6 addressing.
- \* A single IPV6 address is assigned to multiple devices in the network.

- \* It is mainly used by routers
  - \* The anycast address is an address that can be assigned to a group of devices on the network (mostly routers)
  - \* Any data sent to the anycast address is forwarded to the nearest device having the destination anycast address
  - \* The router decides the nearest device with the help of routing table
- Receiver

Sender

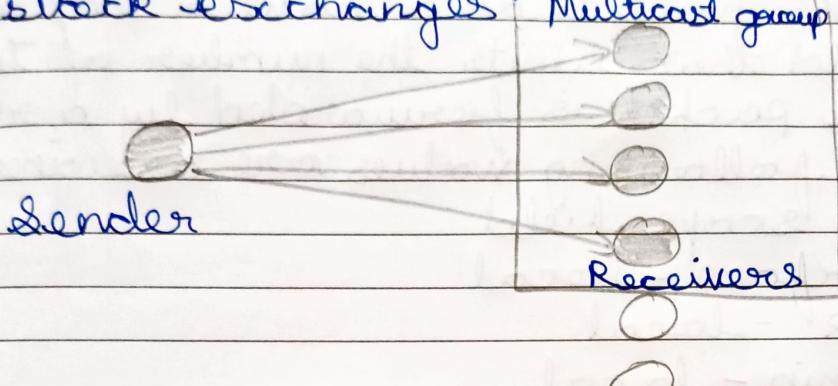


### 3] Multicasting

- \* It is a kind of transmission type in which a single source communicates a message to a group of devices
- \* It is one - to - multiple transmission
- \* All the devices interested in receiving the messages will have to first join the multicast group
- \* It is used in an IP multicast group in the network which consists of all the devices that are interested in receiving the multicast traffic
- \* The source need not be the member of the group. A multicast address can

never be the source address

- \* If a sender multicasts some data on a destination's address, all the devices that are connected to the destination IP multicast group will receive the data
- \* It is widely used for Multipoint delivery & stock exchanges Multicast group



#### 4] Broadcasting (diagram last)

- \* It is a transmission type in which the data traffic flows from a single source to all the devices on the network
- \* It sends the info to every device at once
- \* The same data is received by everyone making it efficient for spreading the msg with all nodes
- \* It is an IPv4 specific data transmission type
- \* HTTP can be used for broadcasting
- \* A Hub generally performs broadcasting in a network
- \* It is mainly used when we do not have any specific destination address or we want to wide spread the message
- \* It cannot be implemented using IPv6
- \* It is mainly used for router update & ARP (Address resolution protocol) requests

### 6] Describe scope of Multicast addresses

- \* IPv6 multicast addresses have an explicit 4-bit scope field that specifies how far the multicast packet will travel
- \* IPv6 packets also have a hop limit field that limits the number of times the packet is forwarded by a router
- \* The following values are assigned to the scope field

1: interface-local

2: link-local

4: admin-local

5: site-local

8: organisation-local

14: global

- \* The remaining values are unassigned or reserved

- \* An interface-local datagram must not be output by an interface and a link-local datagram must never be forwarded by a router

- \* What defines an admin region, a site or an organisation is up to the administrators of the multicast routers at that site or organisation

- \* IPv6 multicast addresses that differ only in scope represent different groups

- \* IPv4 does not have a separate scope field for multicast packets

## Scope

Interface-local

## IPV6

## Scope

## IPV4

Administrative  
Scope

Interface-local

1

0

Link-local

2

1

224.0.0.0 to

Site-local

5

&lt;32

224.0.0.255

Organisation-local

8

239.255.0.0

to 239.255.255.255

Global

14

 $\leq 255$ 

224.0.1.0 to

238.255.255.255

Sender

Receivers

