

21.04.20

# Tutorial

JOVIAL JOE  
1ES17CS016

- Q1. Explain the name - address resolution techniques used in DNS. (5)
- Q2. Write notes on MIME. (5)
- Q3. Explain the three different phases in TCP transmission with the help of diagrams. (5)

A1.)

- ~ DNS - Domain Name System is a hierarchical and decentralised naming system for computers, services, or other resources connected to the internet or private network.
- ~ Mapping a domain name to an IP address is known as Name - Address Resolution.
- ~ The domain-name server resolver performs this operation, by consulting the name servers.
- ~ In order to find a particular DNS the requesting host places its query to the local DNS server.

with a mapping request.

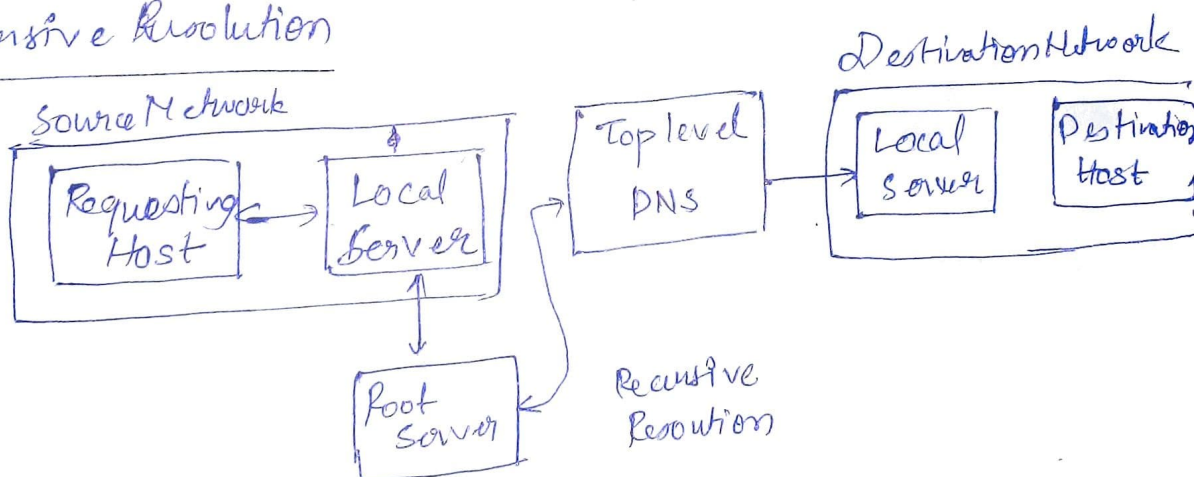
~ If it has the information, the resolver is content otherwise the resolver is referred to other servers to obtain information.

~ The resolver also checks for the correctness of the response, if it is correct the response is passed to the process that requested it.

resolution

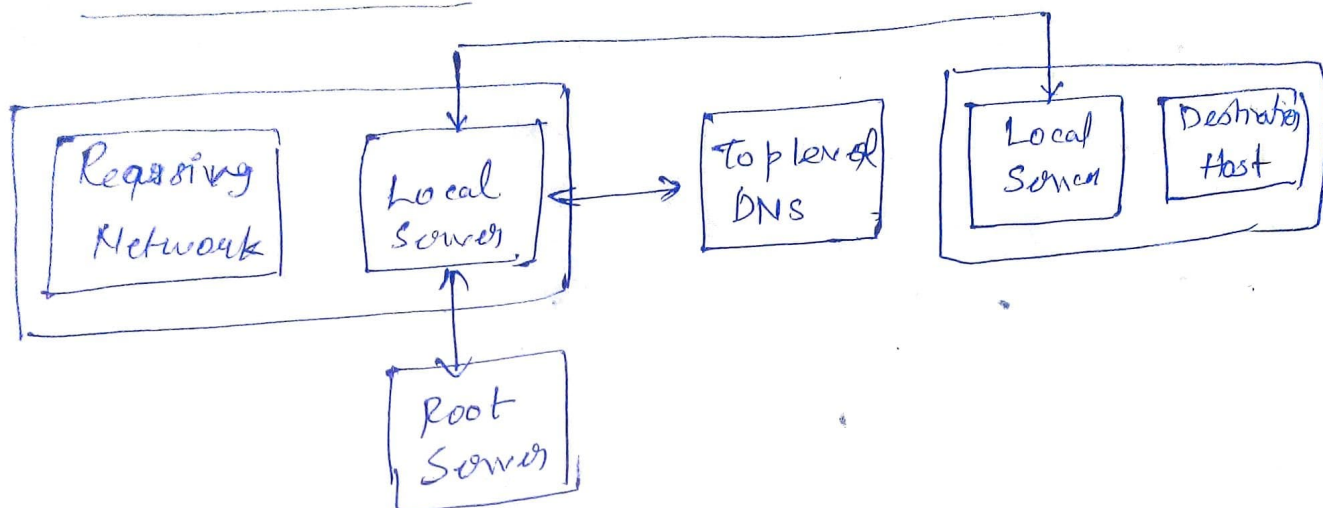
~ A ~~resolver~~ are primarily of two types:

### (i) Recursive Resolution



- ~ It asks for a mapping request from the other server.
- ~ If it is present the response is sent to the requesting host.
- ~ Else the IP address is sent back through top level DNS.

## (ii) Iterative Resolution



- ~ Here each server does not know the mapping send the IP of the next server to the one requested it.
- ~ A DNS query is generated by the application program to the resolver to fetch the destination IP address.
- ~ The top level Domain server is contacted by the local server and it returns the IP or its local DNS server.
- ~ The response is the final passed to the host via local DNS server.

## A2) MIME

- ~ MIME stands for Multipurpose Mail Extension.
- ~ It is a standard proposed by Bell Communications in order to expand the capabilities of emails.



- ~ MIME is a kind of add on or a supplementary protocol which allows non-ASCII data to be sent through the SMTP (Simple Mail Transfer Protocol).
- ~ It allowed different kinds of datafiles like videos, audio, images, video etc.
- ~ MIME supports unlimited message length with multiple attachments.
- ~ MIME protocol converts non-ASCII format to ASCII extended format, the conversion takes place in reverse at the receiver's end.
- ~ MIME header is added to the original email to define the transformation. — which include (header)
  - (i) MIME version      (ii) Content Type encoding
  - (iii) Content Type      (iv) Content id & description.

A3.) ~ TCP (Transmission Control Protocol) provides a connection oriented service over packet switched networks.

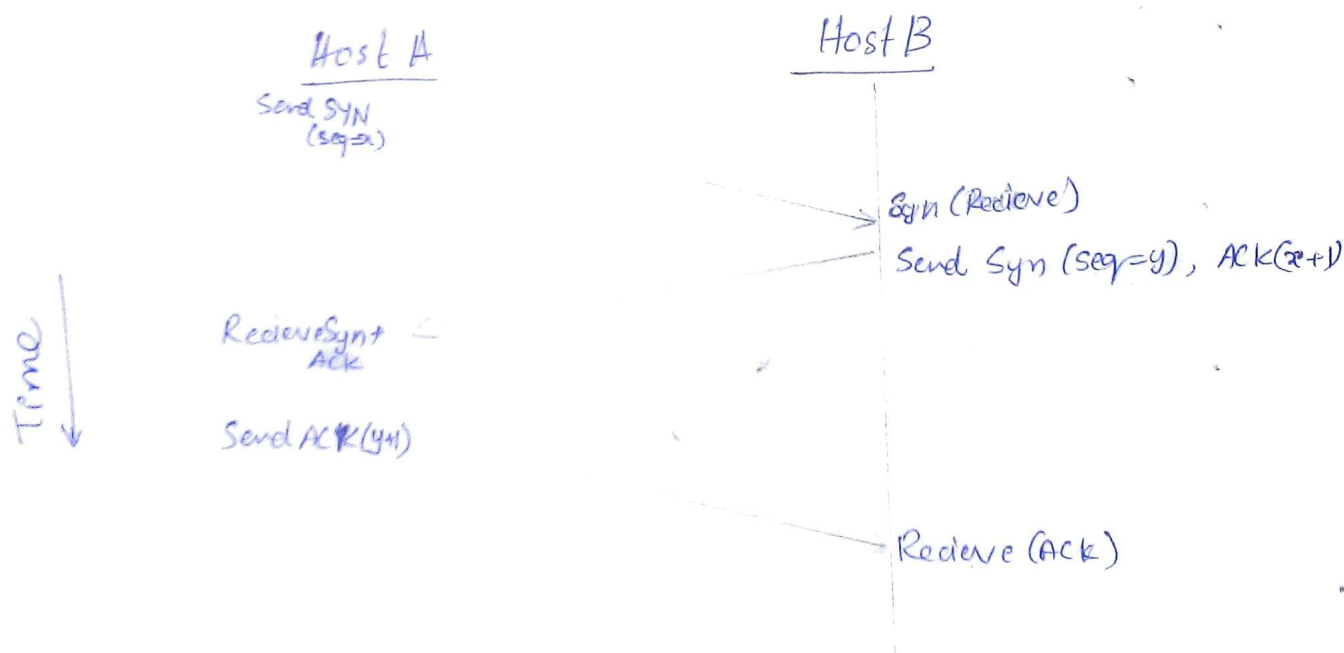
- ~ Connection oriented implies there is a virtual connection between two endpoints.

~ There are three phases in any virtual connection

- (i) Connection Establishment
- (ii) Data Transfer and
- (iii) Connection Termination

## 1. Connection Establishment

~ Two hosts must first establish a connection by exchanging message in what is known as the three-way handshake.



Terms: SYN = synchronize (bit)  
ACK = Acknowledgment

seq = sequence number

~ Host A initiates the connection by sending a TCP segment with SYN control bit & an initial sequence number (x).

~ Host B receives it and responds with a TCP segment of its own

as SYN bit set to one and initial ~~bit~~ sequence number  $y$ .  
Additionally Host B also sends the ACK. \*

- ~ Host A received B's initial sequence number & ACK upon which it finishes the connection establishment with a final acknowledgment and the seq as  $(y+1)$ .

## 2. Data Transfer

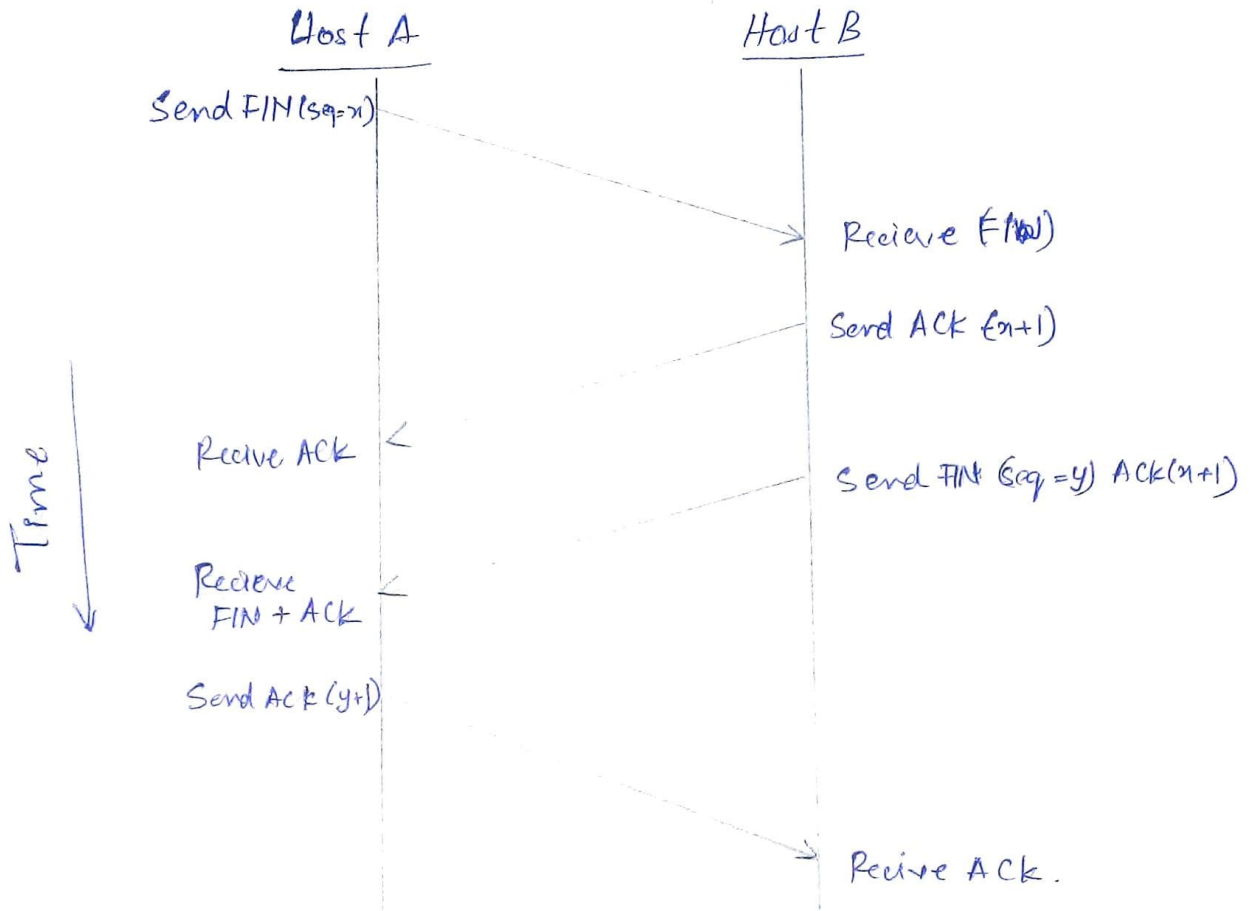
- ~ Once sequence numbers have been exchanged communicating application can transmit data with each other.
- ~ As the receiver receives a process TCP segment it responds with positive acknowledgment.
- ~ If no data is send even the the TCP will simply be idle.
- ~ If data is queued & it exceeds receiver limit then the sender must wait for further acknowledgments.

## 3. Connection Termination

- ~ To terminate the connection, the application on host A signals a TCP close connection.  
(no more data)
- ~ This generate the first FIN segment from Host A to Host B.
- ~ Host B then acknowledges the segment and notifies its destination application, and finally it also sends

a FIN bit to Host A.

~ Host A responded with a final acknowledgment as the connection is terminated.



Terms: FIN = no more data to send ('bit')

ACK = Acknowledgement

seq = Sequence number (Host A(x), Host B(y))