



DAY 6

THREE-WAY HANDSHAKE

- A three-way handshake is a method used in a TCP/IP network to create a connection between two hosts.
- It is a 3 step process that requires both the client and server to exchange SYN and ACK (acknowledgment) packets before actual data communication begins.

Process is as Follows:

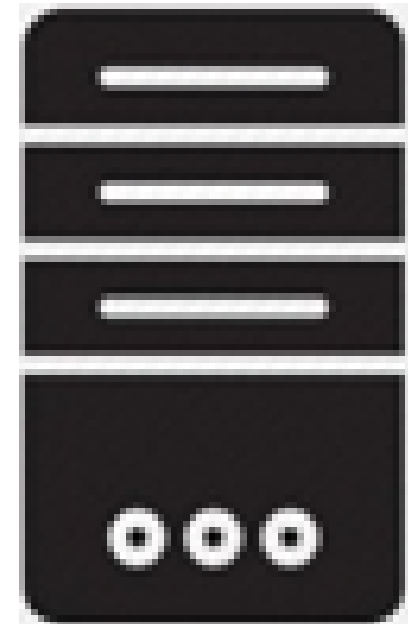
- A client node sends a SYN data packet to a server it wants to communicate to. The objective of this packet is to ask/infer if the server is open for new connections.
- If the server is willing to communicate to the client (if the port is open) it responds with an ACK packet.
 - It also expresses its intention of talking back to the client with its SYN packet.
 - Together it is SYN/ACK
- The client node responds with an ACK for the server's SYN.
- **Upon completion of this process, the connection is created and the host and server can communicate.**



SYN

< SYN,ACK

ACK



TCP FLAGS

Flag	Description
SYN (Synchronization)	It is used in first step of connection establishment phase or 3-way handshake process between the two hosts.
ACK (Acknowledgement)	It is used to acknowledge packets which are successful received by the host.
FIN (Finish)	It is used to request for connection termination i.e. when there is no more data from the sender, it requests for connection termination.
RST (Reset)	It is used to terminate the connection if the RST sender feels something is wrong with the TCP connection or that the conversation should not exist
PSH (Push)	It tells the receiver to process these packets as they are received instead of buffering them.
URG (Urgent)	Data inside a segment with URG = 1 flag is forwarded to application layer immediately even if there are more data to be given to application layer.

EXAMPLES OF IP ADDRESS

- 11000000 . 10100010 . 01000000 . 00000101
192 . 168 . 64 . 5

128 64 32 16 8 4 2 1 = 255

1 1 1 1 1 1 1 1 = 11111111

SUBNETTING

- A method of dividing a single physical network into logical sub-networks (subnets)
- Default subnet mask for
- Class A 255.0.0.0
- Class B 255.255.0.0
- Class C 255.255.255.0

NETWORK AND HOST BITS IN IP ADDRESS

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- CLASS A N H H H DEFAULT SUBNET 255.0.0.0
 - CLASS B N N H H DEFAULT SUBNET 255.255.0.0
 - CLASS C N N N H DEFAULT SUBNET 255.255.255.0

CLASS C $2^8 = 256$ HOSTS

CLASS B $2^{16} = 65536$ HOSTS

CLASS A $2^{24} = 16777216$ HOSTS

IP, SUBNETS AND DEFAULT GATEWAYS

Class C

IP Address 192 . 168 . 100 . 225
Subnet Mask 255 . 255 . 255 . 0
Gateway 192 . 168 . 100 . 1

Class	Range
Class A	1 - 126
Class B	128 - 191
Class C	192 - 223

Class B

IP Address 172 . 123 . 100 . 225
Subnet Mask 255 . 255 . 0 . 0
Gateway 172 . 123 . 1 . 225

Class A

IP Address 100 . 228 . 111 . 225
Subnet Mask 255 . 0 . 0 . 0
Gateway 100 . 101 . 123 . 1

ASSIGNMENTS

- TCP/IP PACKET STRUCTURE
- DIFFERENCE BETWEEN PSH VS URG FLAGS (MIN 4 DIFFERENCE)
- WRITE BINARY VALUES FOR FOLLOWING IP ADDRESS
- 172.16.15.2
- 10.20.3.4
- 192.168.54.62

ASSIGNMENTS

- CHECK IS THIS VALID IP'S
- IP ADDRESS 192.168.100.315
- GATEWAY 192.168.100.1

- CHECK THIS TOO
- IP ADDRESS 192.168.10.2
- GATWEWAY 192.162.10.1

- CHECK THIS TOO
- IP ADDRESS 192.168.10.35
- GATEWAY 192.168.10.1



THANK YOU
