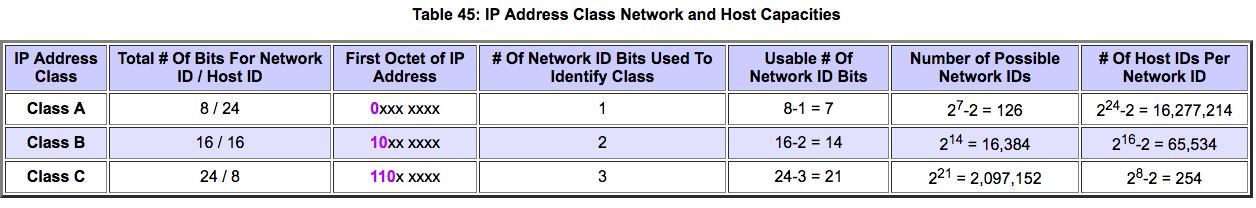
Video 1 : Introduction to computer network and ip addresses



Video 2 : Types of Casting, Unicast and Broadcast

BroadCasting -

1. Limited BroadCasting : broadcast to all hosts in same network

Limited broadcast address : 255.255.255.255

1. Directed BroadCasting : broadcast to all hosts in different network

Directed broadcast address : otherhostid.all1’s eg. 20.255.255.255

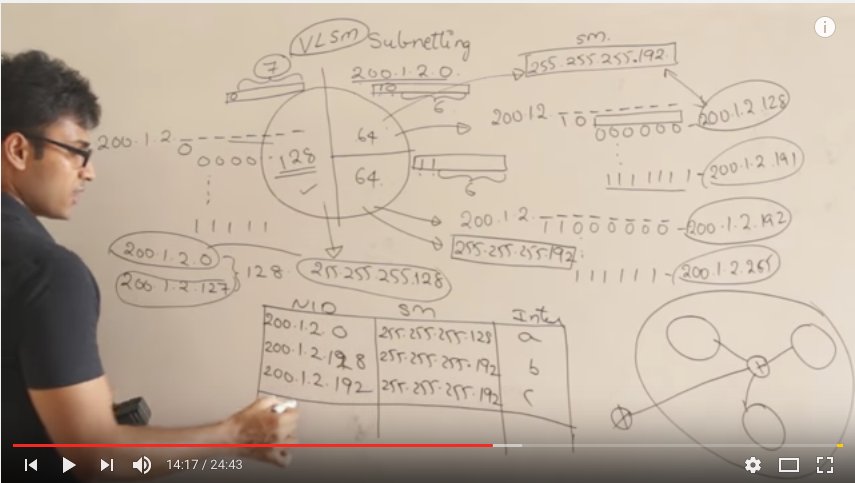
Video 3 : Subnets, Subnet masking, Routing

Subnetting –

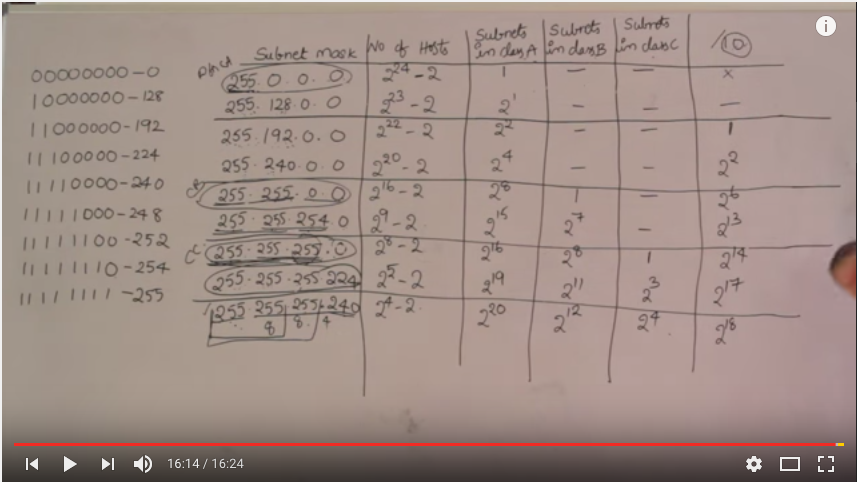
1. Wastageof ip address ( 2 per subnet)
2. For more than one match, go for longest subnet mask eg. Prefer/15 to /12
3. Doesn’t match to any entry goes to default (0.0.0.0 sm 0.0.0.0)

Video 4 : Variable length subnet masking

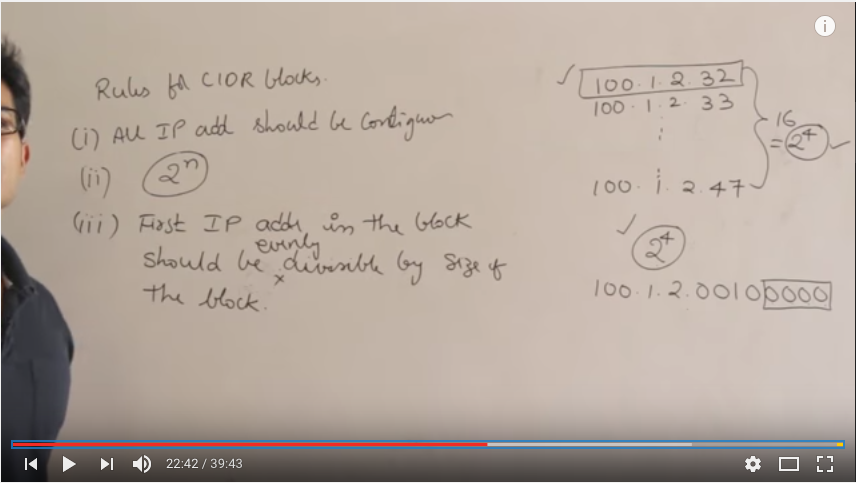
200.1.2.0 – Three networks of 128,64,64. Other than soln below nid’s can be(0,64,128)



Video 5 : Subnet masking questions



Video 6 : Classless InterDomain Routing



Video 7 : Subnetting, VLSM in CIDR

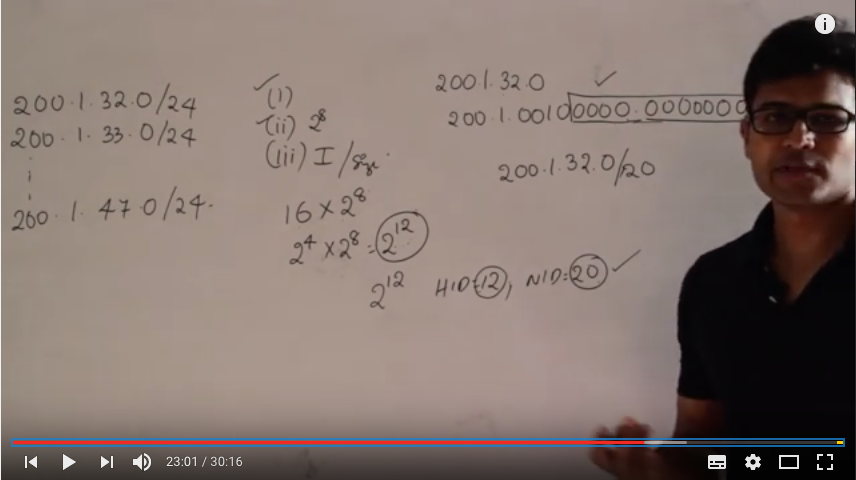
Based on above Concepts

Video 8 : Prolems on Subnet mask

Should be solved

Video 9 : Supernetting and aggregation

I.Continious, II.Same size, III.First NID/size of block



Video 10 : Delays in CN

1. Transmission Delay = Bits / Bandwidth (time to put data from sender to channel)
2. If Data is given as K, it is 1024, For Bits 1K=1024bits, For BW 1kbps=1000bps
3. Propagation Delay = distance / Speed (time to reach the destination)
4. Speed of optical fibre is 70% of light speed, i.e 0.7\*3\*10pow8 = 2.1\*10pow8
5. Queuing Delay = wait in buffer until picked up from queue
6. Processing Delay = time to process the packet

Video 11 : Flow Control Methods, Stop and Wait

Efficiency = Tt / ( Tt +2\*Tp )

Throughput (Effective Bandwidth / BW Utilization)(in bps) = ( bits / ( Tt + 2\*Tp ) )

= ( ( bits / Bw ) / ( Tt + 2\*Tp ) ) \* Bw = ( Tt / ( Tt +2\*Tp ) ) \* Bw

= Efficiency \* Bandwidth

Final Packet = S&W + TimoutTimer + SeqNo to Data + SeqNo to Ack

Error Probability = p, Total packets sent = n + np + np2 + … = n(1+p+p2+…) = n(1/(1-p))

Video 12 : Capacity of pipe and pipelining

Capacity = Bandwidth \* Propagation Delay (For Full duplex mult by 2)

Thick pipe (more capacity), Stop and wait efficiency is less here

Thin pipe (less capacity), Stop and Wait efficiency is more here

Sliding Window Protocol

Window size = 1 + 2a

Min Seq no = 1 + 2a

Bits reqd = log2( 1 + 2a )

Ws = min ( 1 + 2a , 2powN )

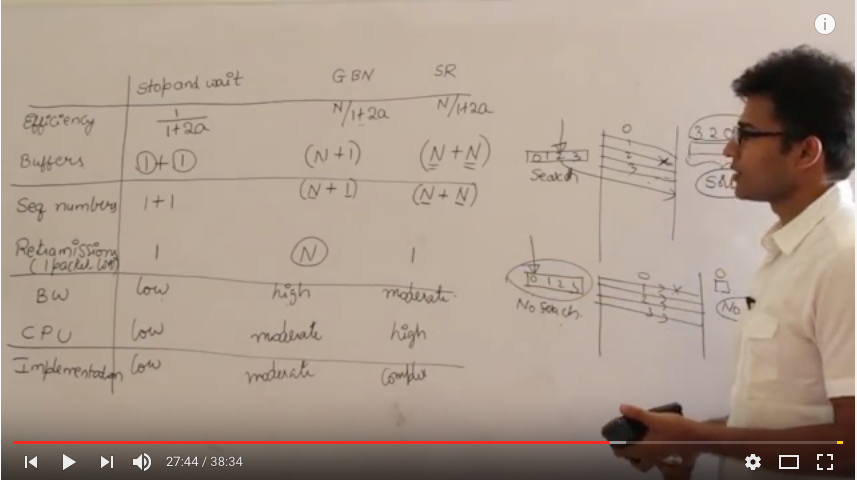
Video 13 : Go Back N

Available Seq No >= (Wsender + WReceiver) to avoid duplicate packets and more.

For Stop and Wait, We should have min of 2 seq numbers.

Video 14 : Selective Repeat and comparision bw Sliding window variants

Advantages of S&W and GoBackN in Selective Repeat, Superior to others.



Video 15 : Intoducton to Access control methods, TDM and Polling

TDM Efficiency = Tt / ( Tt + Tp )

Polling Efficiency = Tt / ( Tt + Tp + Tpoll )

Video 16 : CSMA/CD

No acknowledgements, only collision detection

Worst case scenario to get collision signal : Tt >= 2 \* Tp

Efficiency = ( Tt / ( C + 2Tp + Tt + Tp ) )

= ( Tt / ( e + 2Tp + Tt + Tp ) )

= ( 1 / ( 1 + 6.44a ) )

Suitable for LAN not WAN, Large packets gives better efficiency

Video 17 : BackOff Algo for CSMA/CD

BackOff Algorithm : Waiting time = K \* time slot ( K belongs 0<=k<=2pow(n-1) )

n is collision number for that packet.

Capture Effect : If a station wins first collision, its chances/prob increases for next packets.

Backoff algo can only be applied for two carriers.

Video 18 : Token Passing Access Control method

If time given in bits, calculate Transmission delay.

If time give in metres, calculate Propagation delay.

Token ring passing is Unidirectional, Carrier with token can only transmit the data.

Ring Latency : Tp + N \* Tt

Cycle Latency : Tp + N \* TokenHoldingTime

Efficiency : ( ( N \* Tt ) / ( Tp + N \* TokenHoldingTime ) )

EarlyTokenInsertion : TokenHoldingTime = Tt, default case, better efficiency

DelayedTokenInsertion : TokenHoldingTime = Tt + Tp, better reliability

Video 19 : Aloha and diff between flow and access control methods

Acknowledgements, no need of collision detection

Vulnerable time : 2 \* Tt

Efficiency ( Pure Aloha ) : G \* e pow -2G, max eff 0.184

Efficiency (Slotted Aloha ) : G \* e pow –G, max eff 0.368

Video 20 : Error Control and CRC

Error Detection methods : Parity check, CRC, Checksum

Error Correction methods : Hamming Code (needs half extra redundant packets,more processing required)

Cyclic Redundancy Check 