NIPS thm Assignment-2

2300030642

1. Dual stack technique:

The dual stack technique allows devices to run both IPv4 and IPv6 simultaneously. This enables seamless communication between IPv4-only and IPv6 only networks.

Backward compatibility: Ensures IPv4 applications continue functioning while adopting IPv6.

Organizations can migrate in phases without disrupting operations.

2. 196.220.84.32

class C

255.255.255.0

→ 255.255.255.128.

(i) 196.220.84.1 (first host)

196.220.84.126 (last host)

196.220.84.127 (broadcast).

(ii) 196.220.84.128/25

196.220.84.129 (first host)

196.220.84.254 (second host)

196.220.84.255 (broadcast)

→ No of hosts per subnet = 126 ($2^7 - 2$)

3.

Hub: Broadcasts data to all connected devices

Bridge: Filters and forwards data between network segments, operates at layer 2

Router: determines best path for data packets across network operates at layer 3.

Gateway connects different network architecture and protocols, facilitating inter network communication.

Gateway: Connects different networks

4.

class	Address range	subnet mask	no of networks	hosts
A	1 – 126	255.0.0.0	128	16,777,214
B	127 – 191	255.255.0.0	16,384	65,534
C	192 – 223	255.255.255.0	2,097,152	254

5. Carrier sense multiple access:

CSMA allows devices to detect whether a transmission medium is in use before sending data.

CSMA/CD : used in wired ethernet. If a collision occurs, transmission stops and retries after a random time.

CSMA/CA : used in wireless networks and devices sense before transmitting and use acknowledgment mechanisms to prevent collisions.

6. IPv6 header fields:

4 bit version

traffic class (8 bits)

flow label

payload length

next header

Hop limit

Source & destination

IPv4:

Simplified header

Larger address space

Built in security & QoS.

7. classful addressing:

Uses fixed subnet masks (A, B, C) leading to inefficient IP allocation

classless Addressing: Uses variable-length subnet masks (VLSM) for efficient IP allocation.

Advantage: Eliminates unused IPs, enabling better network scalability

8.

→ Network level

→ Subnet level

→ Host level

Network: Identifies the primary network

Subnet: Further divides the network into smaller sections.

Host: Assigns unique address to devices within a subnet.

Hierarchical IP addressing optimizes routing efficiency and address management.

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