Experiment - 11

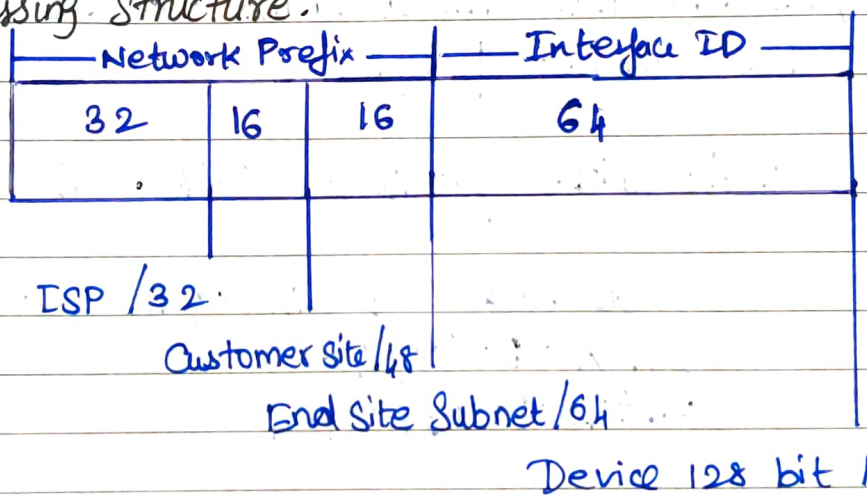
IPV6 STUDY

ROHIT RANGANATHAN
RA1911033010017
CSE SWE L2

IPV6 Addressing:

An IPV6 address is 128 bits, so 2^{128} addresses. It can be reduced to 32 hex digits

Addressing Structure:



Addressing Model:

1. Unicast:
   Packet is sent to a single interface.

2. Anycast:
   Packet is sent to the nearest of group interfaces

3. Multicast:
   - Packet is sent to multiple interfaces

Address Range:

- Unspecified Address — ::/128
- Loopback — ::1/128
- Global Unicast (0010) — 2000::/3
- Link Local (1111 1110 10) — FE80::/10
- Multicast Address (1111 1111) — FE00::/8
- Unique Local Address — FC00::/7

PREFIXES:

→ The part of the address that indicates the bits that have fixed values or are the bits of the Subnet prefix.

→ An IPV6 prefix is written in

address / prefix-length notation.

21DA:D3::/48

21DA:D3:0:2F3B::/64.

Local Addresses with network Prefix:

A part of prefix (40 bits) are generated using a pseudo random algorithm. Similar to the RFC 1918 private address like in IPV4

Global Addresses with Network Prefix:

- Global Unicast Address.

0010 2000::/3 → 0011 3FFF:FFFF:....:/3

°6 to 4 Addresses.

Designed for a special tunelling mechanism [RFC 3056] to connect IPV6 Domains via a IPV4 clouds.

Need 6 to 4 relay routers in ISP network

IPV6 Auto Configuration:

→ Enables the host to assign a IPV6 address on its own.

① Stateless Mechanism

→ Suitable for small organisations and individuals

→ Hosts determines its addresses from the contents of received router advertisements

→ Uses IEEE EUI-64 standard to define the network ID portion of the address.

→ No Additional Servers.

→ No Manual Configuration.

② Stateful Mechanism.

→ For sites & organisations that require tighter control over exact address assignments.

→ Needs a DHCP Server.

→ Also maintains state information.