IPV6

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Goal of Internet Protocol address (V4)

→ Stitch many networks together

→ 32 bit address

→ So total IP address available → 2^{32}

→ General Utilization is ~ 35 %

Let's welcome IP V6

- Work started in 1996
- Basic protocol published in 1998

2^{32}

* Address Structure

1) 128 bit address ⇒ 2^{128} → diff IP → (3.4×10^{38} addresses : 21 addresses/in² of world's surface)

2) Separated into 2 parts → subnet prefix and host suffix
3) Uses 8 octets and can be represented using hexidecimal as 8 blocks of 16 bits each.
4) Can omit single run of zeroes with :: → two colons (16 bits)
5) Use brackets in URL

protocol http://[2001:420:806d:1::9]:80 → port

Bracket

* Address Assignment → Similar to that of IPV4 and depends on RIR (regional internet registry)

IPV6/(n) → n bits to use for subnet prefix

We can auto generate IPV6 address from subnet /64 & ethernet address.

64

Ethernet has 48 bit address, initial 24 bits denotes manufactur and later 24 bits for devices. 2^{24}

(apple cisco)

Convert 48 bit ethernet address to 64 bit host ID by sticky 0xfffe in the middle

1S and and a 2E