IPv6

Total number of IPv4 addresses:
4,294,967,296

Estimated number of stars in the Universe:
3,000,000,000,000,000,000,000,000

Total number of IPv6 addresses:
340,282,366,920,938,463,463,374,607,431,768,211,456

IPv4

- 32-bit
- 4 octets
- Octets separated by a " . "
- Contains numbers
- Uses NAT

IPv6

- 128-bit
- 8 hextets
- Hextets separated by a " : "
- Hexadecimal
- NAT no longer necessary

IPV6 STRUCTURE

2001:db8:130F:0000:0000:09C0:876A:130B

NETWORK ADDRESS   HOST ADDRESS

TYPES OF IPV6 ADDRESSES

GLOBAL UNICAST

PREFIX ID - 2000::/3

- Unique IPv6 address assigned to a node interface
- Equivalent to IPv4 public IP addresses
- Internet routable

UNIQUE LOCAL

PREFIX ID - FC00::/7

- Communication for devices within a local area network
- Equivalent to IPv4 private IP address
- Not Internet routable

MULTICAST

PREFIX ID - FF00::/8

- Transmission to a group of addresses
- Replaces concept of IPv4 broadcast addresses
- Used as a destination address, not as a source

ANYCAST

PREFIX ID - NONE

- Can be assigned to more than one interface on different devices

LOOPBACK

PREFIX ID - ::1/128

- Required for an IPv6 host to communicate with itself

SECURITY PRINCIPLES OF IPV6

Confidentiality & Integrity

Incorporation of IPSec in IPv6 makes man-in-the-middle attacks difficult

Migrating from IPv4 to IPv6

Undergo a complete risk analysis of network architecture to avoid confusion and errors when deploying and configuring firewalls and other Layer 3 devices from IPv4 to IPv6

Unsupported Infrastructure

Applications or devices which do not support IPv6 should be documented and presented to management either for an upgrade or disposal

25%

Did you know?
25% of all Internet-connected networks advertise IPv6 addresses

Sources:
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