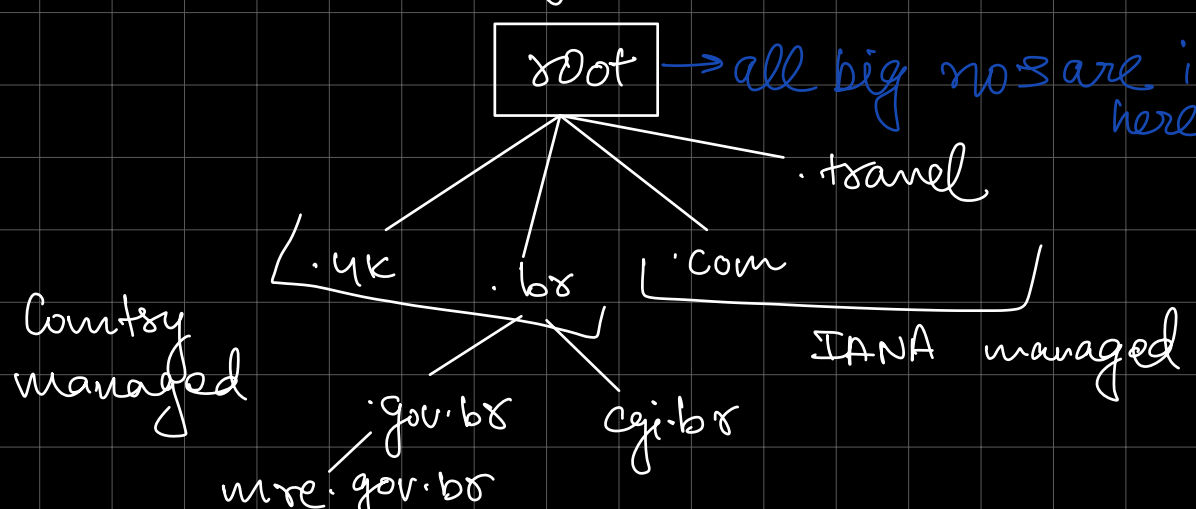
IANA & RIR :-

— IANA manages Number Resources :

+ IP addresses are present in Number resources.
  - Version 4 (Almost exhausted)
  - Version 6 (being deployed)
+ AS (Autonomous System number) :-
  - Every company has its own number.

— IANA could not handle so many countries so there are many RIRs working under it.

— IANA also manages domain structure



- Also manages Internet Protocal numbers:

IP Address?

- Unique identifier of every device.
- Every device in this world needs an IP address to communicate with other devices.

→ IPv4: 32 bit number

2^{32} = 4,294.... addresses
= 4 billion addresses.

Eg: 202.12.29.142
↓
8 bit number.

→ IPv6: 128 bit number

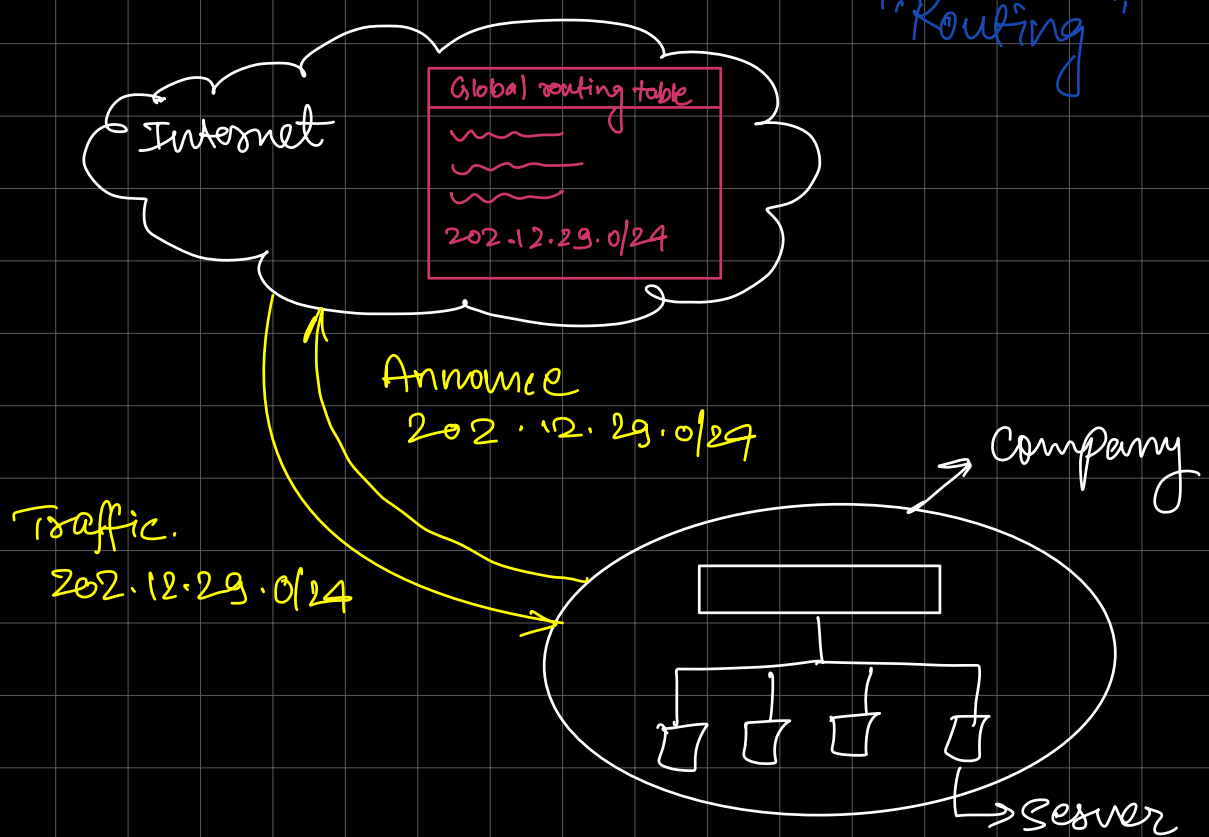
2^{128} = 340 B B B B +

Eg: 2009:0400:3c00:9f92

• Internet address Routing:

- We need IP address because, internet has a very big routing table. Global routing table.
  BGP table.

- Lets say you open a Company "Facebook".



202.12.29.0/24
IP address provided by IANA

- you would have to reveal your company's IP address to the table, only then the would can access you.

- this is called "routing" where you share your roots to the 'internet'

Path ?

your info → router → "internet"

* "IP address is not domain name"

  Eg: IP address: 202:11:2:9

  domain name: www.google.com.

Where do IP address come from ?:

IETF
↓ Delegate
IANA
↓ Allocate
RIR / NIR
↓ Allocate
Network
↓ Assign
User

IPv4 :-

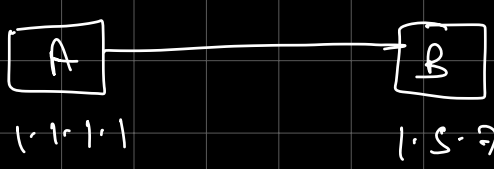
(A)
(B)
(C)
(D)
(E) X

major use

"two computers comm. when network matches"

IP address :-

eg :



— A & B will communicate because the IP belongs to class A, N·H·H·H. only N will be checked.

• Subnet Mask :-

- How computer will know which part is "network", we use subnet mask for that.

Eg:

1.1.1.1 — 1.100.1.2

(1) 255.0.0.0 ✓ 255.0.0.0

classful

(11) 255.255.0.0 ✗ 255.255.0.0

Classless

- subnet mask represents network bits.

Eg: N·N·H·H

↳ Network bit if subnet mask. {255.255.0.0}

Why we divide our Networks?

(A) — N.H.H.H — $2^{24} = 16,777,216$

1.0.0.0

↓

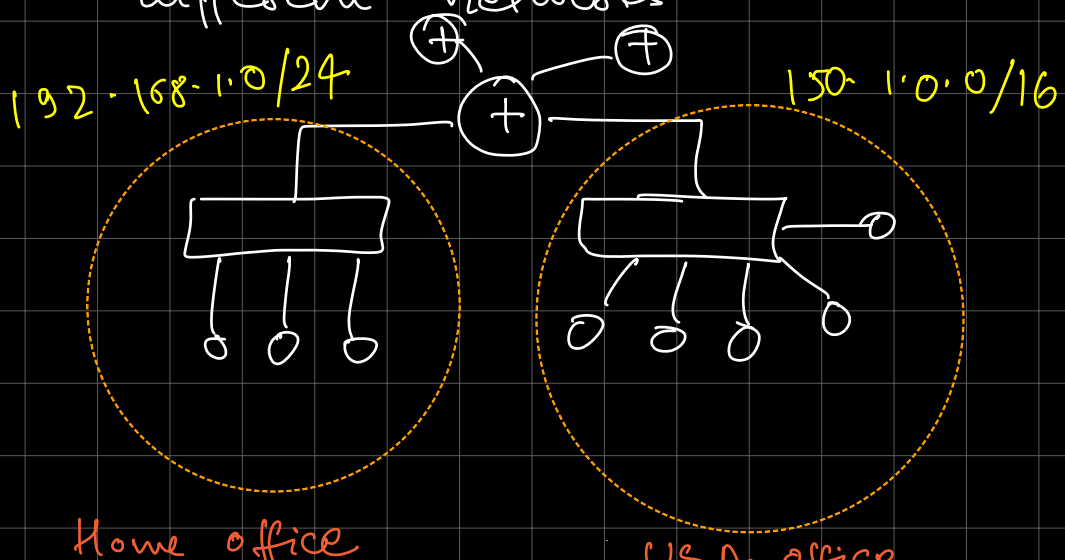
1.255.255.255

(B) — N.N.H.H — $2^{16} = 65,536$

(C) — N.N.N.H — $2^8 = 256$

- Why do we need routers?

— we use routers to connect two or more different networks.



Slash value or CIDR (Classless interdomain routing)

A – N.H.H.H /8

B – N.N.H.H /16

C – N.N.N.H /24

- all networks are different & router only shares the network bits to the internet.

More on Subnet Mask :-

learn!

1 – 128

2 – 192

3 – 224

4 – 240

5 – 248

6 – 252

7 – 254

to represent network bits:

/8 → 255.0.0.0

/9 = 8+1 → 255.128.0.0

/12 = 8+4 → 255.240.0.0

/20 = 8+8+4 → 255.255.240.0

/18 = 8+8+2 → 255.255.192.0

/25 = 8+8+8+1

→ 255.255.255.128