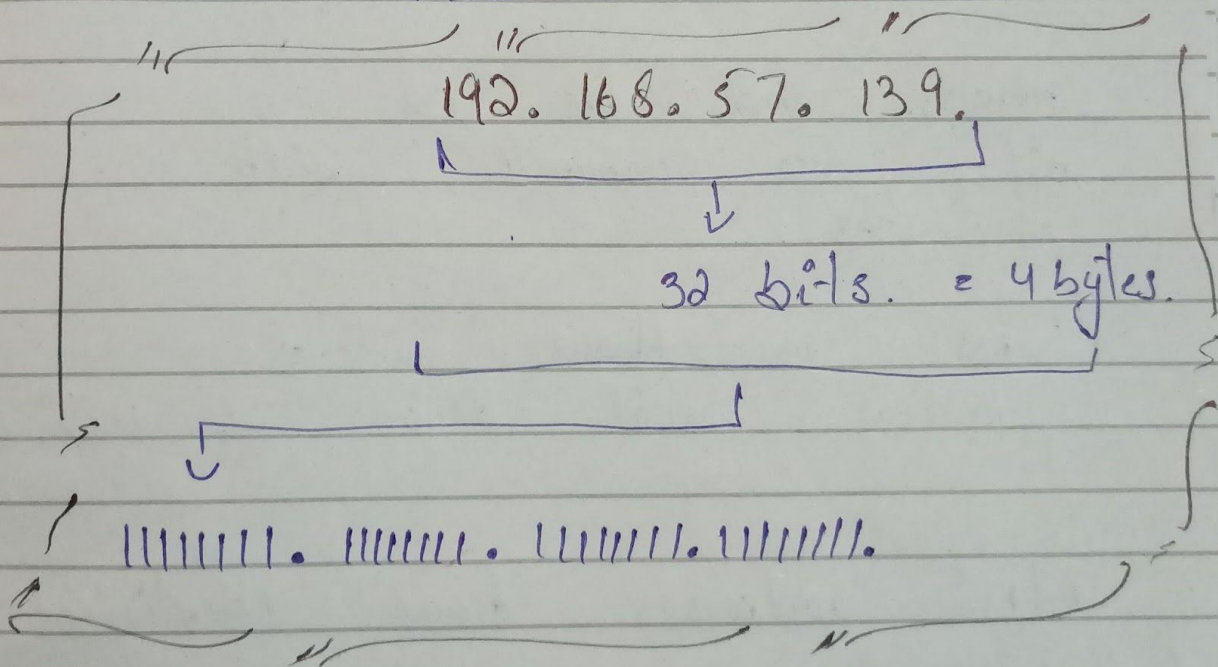# Ip Addresses.

Inet = Ipv4 (decimal Notation)

Inet6 = Ipv6. (Hexa decimal Notation)

Ipv4 :-
This is How we communicate with Layer 3. of OSI model.

192. 168. 57. 139.

32 bits. = 4 bytes.

||||||||. |||||||. |||||||. ||||||||.

$$Ipv4 = 2^{32}. = 4,294,967,296$$

Total ip addres

$$Ipv6 = 2^{128} = 3.40283 \ldots\ldots e+38$$

NAT

Network address translation:

MAC Addresses

MAC = Media access Control

we can use It as physical address, and we can use It to communite with Switches

"This is How switches know what device is what"

MAC addresses have Identifiers

☑ First three pairs are identifiers.

00 : 0C : 29 : 0a : 42 : 05

↓

Identifiers.

mac address are layer 2 of. OSI model.

Layer 4.
↳ "TCP, UDP, and. Three way hand shake"

TCP :-

"Transmisson control Protocol."
↳ connection oriented protocol.

UDP :-

"User DataGram Protocol"
↳ connection less protocol.
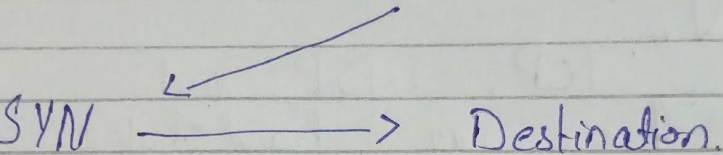
TCP	UDP.
HHp/HHps, SSH, FTP	* Streaming servies * DNS is connection less. * voice over IP

Three way Hand shake.

Send   reive.

SYN ————> SYN ACK.

SYN ————> Destination.

Common Ports.
and Protocols.

Tcp :-	UDP
FTP (21).	DNS (53)
SSH (22)	
Telnet (23)	DHCP (67,68)
SMTP (25)	
DNS (53)	TFTP (69)
HTTP (80)	
HTTPS (443)	SNMP (161)
POP3 (110)	
SMB (139+445)	
IMAP (143)	

OSI Model.

Please Do Not Through
Sauge Pizza A way

1	P	=	Physical	Data cable, cat 6.
2	D	=	Data	Switching, mac address.
3	N	=	Network.	IP, address, routing.
4	T	=	Transport.	TCP/UDP
5	S	=	Session.	Session manrgment
6	P	=	Presentation	WMU, JPEG, MOU
7	A	=	Application.	HTTP, SMTP.

Sub netting :-

Dividing big Network into small

B. Sub netting is alway perform
inside the organization

How we implement Sub netting

IPv 4.

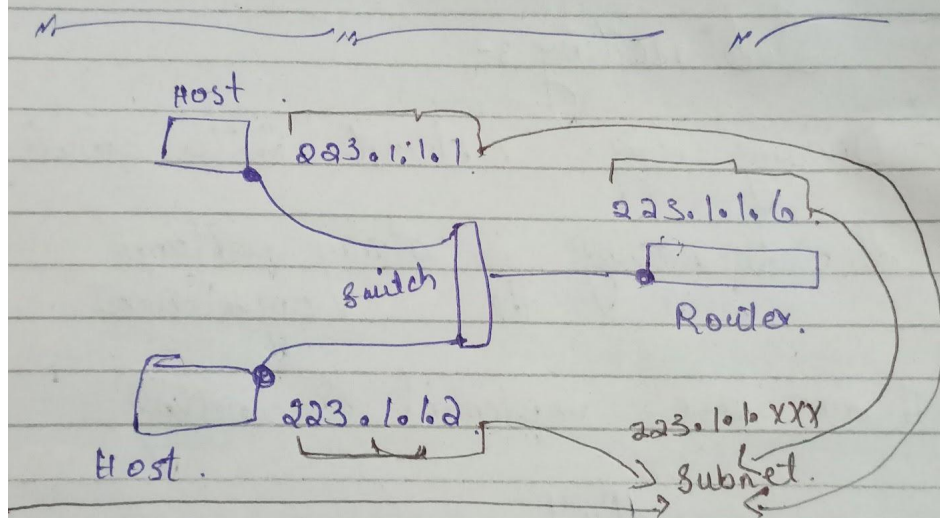11000001   00100000   11011000 0000

⌐ 1 byte.

↓

32 bit

↓

4 bytes.

each bile is writen in
decimal form seprated.
by dots.

193. 32. 216. 9.

Dotted - Decimal Noilation.

Host
223.1.1.1
223.1.1.6
switch
Router.
223.1.1.2
223.1.1.XXX
Host.
Subnet.

The Network Connecting the.
Host interfaces. and one
router interface, hauing
the same IP addresses format
called "subnet."

223.1.1.0/24

ere "/24" is known as Subnet mask

"/24"

↑ It means all devices in the subnet have same. left most "24 bit"

    223.1.1.6
    └────────┘
    24 bit are same.

~~~~~~~~ "~~~~~~~~ "~~~~~~~~

In an Organization each

Subnet has different Address.

    Subnet 1   Address 1
    Subnet 2   Address 2
    Subnet 3   Address 3
    Subnet 4   Address 4

~~~~~~~~ "~~~~~~~~ "~~~~~~~~

In the Global Internet. The IP addressing is handeld. by "Classless Interdomain Routing" or CIDR.

Seven Second Subnetting

Address : 165 . 245 . 12 . 88 / 26.

Step 1 : Convert address and mask into
decimal.

Addr 165   245   12   88

mask.   255   255   255   192.
Net.   165   245   12   64
Broadcast 165   245   12   127.

Calculate the network address :

. If the mask is 255, bring
down the address.

"If mask is 0, use the 0"

"For any number ~~pre~~ refer to
your chart"

Calculate the broadcast addr :-

If mask is 255, bring down
the address.

'If mask is 0, use 255"

For any number refer to your
chart.

Mac address are Layer 2 of.
OSI model.

Layer 4.
↳ "TCP, UDP, and.
Three way hand shake"

TCP :-
"Transmisson control Protocol."
↳
connection oriented protocol.

UDP :-
"User DataGram Protocol"
↳
connection less protocol.

TCP	UDP.
HHp / HHps, SSH, FTP	* Streaming service * DNS is connection less. * voice over IP

CIDR address assignment. Strategy.

In CIDR addressing the Subnet is generalised to.

a.b.c.d/X.

where "/X" indecates

" 11001000 0001011 0001000 0000000

< - - - - - - - - - - - - - - - < >

Number of bits from Left.

First X bits is called "Network-prefix".

An Organization is assigned a range of IP address with a Common "Network prefix"

Organization IP block.   Binary form.

200.23.16.0/20   [11001000 1001011 1001000 . 000000

x = 20.