\* If dotted decimal representation of an IP address? then it falls under class?

(FS13X30) 0-0-0-4

+ Range: 0.0.0.0 to 127.255.255.2559 ton

\* Hord Class A IP address position 28 no. 4 m. ordo

Computer Networks Note.

\* If an IP address contains all has host Id bits on is, then it is not used as IP address. Rather it is used as special address. pradmin did at 4 i.e., Broadcosting.

232, blo 95 and north 2000 good poor majors A &

2-755-255 255 Where 07/127 300 place 380

is con't be wed as on IP address. 1939 lomissed 65/60

हार्य निर्म केल हैं है में है में के कार्य केल हैं है है है है \* If an IP address contains all host Id bits as o's, then it is not used of IP address. It is used of a special address i.e., Network Address.

The above two points are valid for any class. Ei tock I be sometim win tobició de apreten at pellosipal co

\* In a class A IP address,

we can't take network Id and host id all zero at the same time.

\* No of IP addresses possible under class A = 231

\* Also in class A, Fitals

Fries a by rooting of the trusto

bI ales

127. any any any is not possible

· head so controls dis (special address). o prises

also we have in class A

( broad lost address) A 2000

is not possible

also in class A To be productioned to better it the

- (Network Id)

is water clave in

X-0.0.0 (05x5127) is not possible state of 0-0-0-0 = spined

also in class A

o. any any any 15 not possible to assign to a host



Class B No. 275 -575 - 28 - NIW Id no of networks: 214 no of hours in each network: 216 Claus D Range: 128.0.0.0 to 191.255.255.255 total no of ilp addresses possible: 230 the troop is in all will make the south with for each network 2.4.0.0 2.y. 255.255 are not so assigned as IP address They are considered special addresses. ( duct in blue it explosed) 850; parties 191 Had 02/07/20 + In class B we can take all network bits as zeroes. - No of hosts per each network = 216-2 bi 624 Class C: N/w Id possible no of IPS: 29 possible no of networks: 22 noof Its per each network: 28 Range: 192.0:0:0/1/0 1223-255-255 novelet 200 32d soul No of host per Nlw: 128-125-125441200 300 200 100 000 000

2: 192.0.0.255 is not host IP but a broadcast address

all host id bits are 1's

59: 192. 255. 255. 25y - host IP 192.255.254.255 - IP but not host IP 192. 254. 255 - 254 - host IP 192.255.255.0 - IP but not host IP Ft is N/w address is a strandon to out all s mooth notions sold Class D. Conge : 128 . 0 . 0 - 0 t. 1110 Here there is no division like Nlw id 4 Host Id. Class Dis seserved for multicasting. should all as bompishe of lan set 0000000 00000000 00000000 -00000000 224.00 20 224.0.0.0 No of IP addresses: 228 (no address is used for host) Range: 224.0.0.0 to 239.255.255.255 Class E: though house but each house 216-2 1111 No divisions like N/w id I host id no of IP address; 228 Range: 240.0.0.0 10 255.255.255.255 Class E is reserved for future use. possible near networks: 2 hote: noof the meanth network: 25 Classes DIE are disadvantages of classful addressing. 228 28 address are reserved for multicasting and hutare use which is waste. is work.

the state of the

How be send a packet from one host to another host broadcost broadcost address is set to network address of the network overwhich the broad costing is being done. ... broadcost address is cat class c n/w broadcost address is cat class c n/w

-> Unicost: packet is sent from one host to single host.

If router sees all the host ids as its an then it considers the message should be broadcasted.

-> Broadcasting is of two types:

### in Directed Broadcost:

when a host wants to send a packet to all the hosts of another network then it is known as directed, broadcasting

### its Limited Broadcout:

when a host wants to send a packet to all the host of the same network, then it is known to as limited broadcasting. For limited broadcast,

deshination address: 255.255.255.255

that limited broadcasting is to be done

200-1-2.0 12 700-1-2-25 (Subna 1)
200-1-2-128 10 200-1-2-255 (Subna 1)
200-1-2-0 2 37 Oddiess of Schnet 1 100-1-2-25

2001.1.100 is 34 when of subnet 2

	The Francisco	1 That	1 12 11 200	the prince of	bross of
		NIW ID	Directed Broad Cort address	broad Cort dadres prit	whose of rod.
245	1.2.3.4	1.0.0.0	1.255.255.255	255-255-255-255	den est fa
	11- 79-83-107	11.0.0.0	11.255-255.255	255.255.255.255	
	137 - 192-253-3	137-192-0-0	137192-255-255	ho in 22. the	as B
	190.203 - 6-5	190 - 203 - 00	190-203-255-255	2: Look bant	6.1 bound
	188-3-2-0	188.3.0.0	183.3.255.255	.,	
	220 . 127 . 6 . 5	220.127.6.0	220.127 .6.255	month of the state of the	NING TOWNS
	250 - 6 - 1 - 2	250.0.1.0	1 2 1 de	Jan 2000	-class & address
	300.7.19.55	Invalid IP	Invalia IP		has not no N/w oid 4
				sample and to a	host id part

.. not broadcast addresses.

### Subnetting.

when a host wants in send a packet to all -> Dividing a larger network into in subnetworks is called subnetting. whomas belimis do

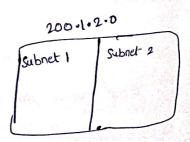
-, when a nlw is divided into subnetworks, we must need routers blu subnets. This router is called internal router. This internal souter is connected to external router.

5: Consider Class C IP address Network 200.1-2.

we will has 2sy possible hosts. This can be divided into Fg1) two subnets as shown below

> 200.1.2.0 6 200.1.2.127 (subnet1) 200.1.2.128 to 200.1.2.255 (Subnet 2)

we say 200-1.2.0 is IP address of subnet 1 200.1.2.128 is IP address of subnet 2



guen in subnets also we should not take all host bits as all is one dl 05br subject 2 to the ST less who sund me and The door (200.1.2.0000000) network add tess whale dividing into 200 - [ . 2 . 0 000000] subjet we borrow bites 200.1.2.0000000 200.1.2.C Host IPS from host bit to group the hosts 20001-2.0111111 > broadcast address for subnet 2 1 tonder 200-1-2-10000000 -> N/w address of subject 2 20001.2.10000001 200-1-2-10000010 host IPs of Subnet 2 200 - 1.2.1111110 200. 1. 2.1111111 -> Broadcast address of Subnet 2 Thus here 200-1-2-128 is network address of subnet 2, but not For each subnet we have by IPs & be heet IPs host IP First IP of subject 2 15 200-1-2-128 tindes. First host IP of subnet 2 is 200.1.2.129 03/07/20 advantages of subnething: Subject 3 \* Maintainence is easy \* Provides security with egip of symp hosts of some wiw Disadvantages:

\* Identification of host is complex one more steps are needed to pron to hind a host. If the relative largething of request to protein of the

destination.

are worked.

.. In the above subnets we can have only 252 host IPs out of 256 IPs

Eq: Divide the network 200-1-2-0 into four equal subnets.

solth freates + 1 0000000

Given is classic

to divide into four groups y we need to borrow 2 bits;

	subnet 1	Subnet 2	- 15man2				
1		200-1-2-0100000	64 IPS 1 62 host To				
	200-1-2-00111111	200-1-2-01 11111	200-1-2-10000001				
	sten les	A or not	1.2000000				
	200-1-2-10000000	1	(Sub2)				
	200 - 1 - 2 - 10 111111	200-1-2-19111111	Sub3 (Sub)				
Subnet:			Subnet 4				
Thus here 200-1-2-128 is retuced address I subject 2 but not							
For each sub	net we have	64 IPS & 62	host IPs (R2)				

Subnet 1 200.1.2.0 200.1.2.63

Subnet 2 200.1.2.64 200.1.2.127

Subnet 3 200.1.2.128 200.1.2.191

Subnet 4 200.1.2.192 200.1.2.255

\* Any message that is set no one hosts in the Subnet is thirst sent to internal router. The internal router send the message to the destination.

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1

7

exid & worred sw MAL 10

\* For the external routers, the network is seen as one whole networks but not as subnets.

# Confusions in submetting

- 1) The Nhaid of whold Nha in Egil is 200-1-2-0 and also subnet address of subnet is 200-1-2-0. Both are some on
- broadcort address it the whole network.
- 3) a) If somewhere says NIW ID 200.1.2.0, what does that mean?
  - b) It someone says 200.1.2.255, is it broadcast for the whole "
    Who or only for the subnet 2.

# Resolving conflicts in broadcast address:

If the destination address is 200.1.2.255 we don't know whether it should be broadcasted over the entire metwork; it should be broadcasted over the entire metwork; it should be broadcasted over the entire metwork; it or over subnet 2. This is resolved as follows:

is If message is being sent by a host which is from a different

No then the mass message is broadcasted over entire network.

Othis are external user don't know the network is divided into subnets)

is it packet is being sent by a host which is from a the same

Now then the packet is broad couted over Subnet 2 (This cut internal user knows the structure of NIW)

And supply and spring total

Outsider user (other NLW) can never broadcast over a single subnet even if to he uses the subnet broadcast address.

5: Divide the now 200.1.2.0 into 6 Tsubnets. a dended to for the distriction 801: For this we borrow 3 bits configurate in situations 1200.1.2.96 200-1-2-32 20011.2-95/1 200.1.2.127 200 0 [0 2 . 3] 200 - 1 - 2 - 63 broadcort address of subnet 2 is equal to 200-1-2-924 200 01020192 200-1-2-160 7200.1.2.128 hood all a MOSE LOVE 200.1.2.255 20001.2.223 200.1.2.191 200.1.2.159 Sho smoz) At a

of these we have 180 hosts in total

These two are left unused. If we can use then later if needed

Resoluting softlete in broduct and ess.

In the above case

2000 8th subnet is not used (i.e., it contains no hosts)

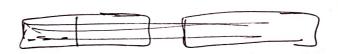
- -> Still of external user sends a mag with destination address that 200.1.2.255 the message is broad caseted, over the network.
- and is not broadcasted.
  - Q1 The address of a class B is split into subnets with a 6 bit number. what is the maximum no of host in each subnets?
    - a) 62 subnets and 262142 thosts were all second resultanting
    - b) 64 subnets and 262142 hosts
    - 10162 Subrets and 1622 Hostory and Cald wife your subjection of
      - d) 64 subnets and Torigo hoses some sit some of and

· sol :

Class B => 2 bytes for host id

i.e., 16 bits

SIACRITE



no othosis: 213-2

no f s

Subnet Mask: