শিক্ষা নিয়ে গড়বো দেশ তথ্য-প্রযুক্তির বাংলাদেশ

Bangabandhu Sheikh Mujibur Rahman Digital University, Bangladesh

LAB WORK

COURSE NO.-ICT 4256
COURSE TITLE-COMPUTER NETWORKING LAB

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For Networking 8-5-23

28. 182.44.82.16/26 [last octate: .00010000] (Network Portion)

Network address : 182.44.82.0/26

1st address : 182.44.82.1/26

Last address : 182.44.82.62/26

29. 211.17.180.0/24

32 subnets = 2^5 subnets

∴ 5 bits are to be kept from the last octate, 211.17.180.0/29

∴ subnet mask : 255.255.255.248/29

possible hosts in each subnets : $2^3 - 2 = 6$

1st usable address for first subnet : 211.17.180.1/29

Last usable address for first subnet : 211.17.180.6/29

1st usable address for last subnet : 211.17.180.249/29

Last usable address for last subnet : 211.17.180.254/29

1. 192.16.72.134/16

1st possible IP address : 192.16.0.1/16

subnet mask : 255.255.0.0

Gateway : any ip address between 192.16.0.1 to 192.16.254.255 excluding the ip addresses for the hosts.

2. 255.255.255.128 has only 7 bits for the host part.

∴ $2^7 - 2 = 126$ PC can be connected to that subnet.

3) 300.300.300.300 is not a valid ip address.

In IPv4, each octate (separated by a dot) consists of 8 bits

∴ the maximum value of each octate can be,

$$(1111\ 1111)_2 = (255)_{10}$$

∴ any number above 255 (and also below 0) are not valid in dotted decimal representation.

But it were written in octal, then it would've been valid.

2) Symmetric: In computer networking, symmetric refers to a network that has a single route for incoming and outgoing network traffic.

example: A LAN with a single router.

diagram:

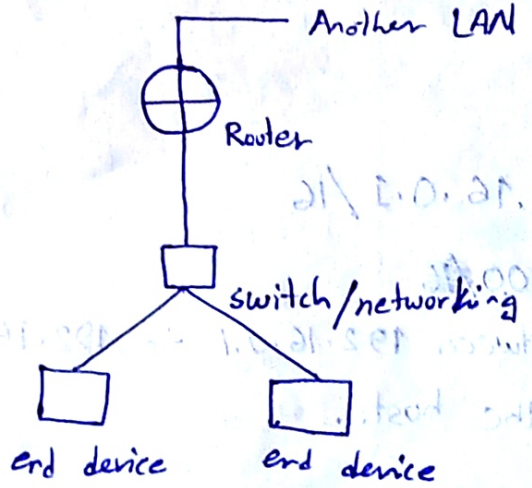

Figure: A LAN

21. 203.208.166.66/27

a) Subnet mask: 255.255.255.224

b) subnet address: 203.208.166.64/27

c) broadcast address: ~~203.208.166.127/27~~ 203.208.166.95/27

22. 192.168.5.44/26

subnet mask: 255.255.255.192

Network address: 192.168.5.0/26

23. 172.18.10.0/23

subnet mask: 255.255.254.0

subnet address: 172.18.10.0/23

start address: 172.18.10.1/23

Network address: 172.18.10.0/23

Broadcast address: 172.18.11.255/23 ~~[illegible]~~

24. 172.18.10.0/23

to get 4 = 2^2 subnets we will borrow 2 bits from the remaining host portion.

(32-23) = 9 bits

1st subnet

subnet address: 172.18.10.0/25

start address: 172.18.10.1/25

subnet mask: 255.255.255.128

broadcast address: 172.18.10.127/25

2nd subnet

subnet add.: 172.18.10.128/25

start add.: 172.18.10.129/25

subnet mask: 255.255.255.128

broadcast add: 172.18.10.255/25

3rd subnet

subnet add.: 172.18.11.0/25

start add.: 172.18.11.1/25

subnet mask: 255.255.255.128

broadcast add.: 172.18.11.~~255~~ 127/25

4th subnet

subnet add.: 172.18.11.128/25

start add.: 172.18.11.129/25

subnet mask: 255.255.255.128

broadcast add.: 172.18.11.255/25

26. 205.16.37.39/28

1st IP addran : 205.16.37.33/28

last IP add. : 205.16.37.46/28

27. 192.20.0.0/27

~~as it has borrowd 32-27~~

as it has borrowd $8-(32-27) = 3$ bits from the last octate for subnets.

$\therefore 2^3 = 8$ subnets are possible

and $(32-27) = 5$ bits remain in the host portion

$\therefore 2^5 - 2 = 32-2 = 30$ hosts are possible in every subnet.

18.

LAN-1 requires 511 IP addresses, $511 \leq (2^{10}-2)$ .. at least 10 bits should be kept for the host address.

LAN-2 requires 254 IP address, $254 \leq (2^8-2)$ .. at least 9 bits should be kept for the host address.

∴ Say,

LAN-1:

NA: 172.16.0.0/22

BA: 172.16.3.255/22

SM: 255.255.252.0

LAN-2:

NA: 172.16.4.0/23

BA: 172.16.5.255/23

SM: 255.255.254.0

19.

10.2.3.20/22

$2^{(32-22)} - 2 = 2^{10} - 2 = 1022$ hosts.

subnet mask: 255.255.252.0

20. 10.1.2.146/28

BA: 10.1.2.159/28

NA: 10.1.2.144/28

17. Design a network using appropriate classful IP address:

Engineering department = 40 hosts $\leq (2^6 - 2)$ ∴ 6 bits are needed for HB.

(32-6) = 26

192.168.100.0/26

NA: 192.168.100.0/26

BA: 192.168.100.63/26

SM: 255.255.255.192

Human Resource Department = 20 hosts $\leq (2^5 - 2)$ ∴ 5 bits are needed for HB.

(32-5) = 27

NA: 192.168.100.64/27 [Next address after the BA of Engineering dept.]

BA: 192.168.100.95/27

SM: 255.255.255.224

Sales department = 20 hosts

NA: 192.168.100.96/27

BA: 192.168.100.127/27

SM: 255.255.255.224

Technical support department = 20 hosts

NA: 192.168.100.128/27

BA: 192.168.100.159/27

SM: 255.255.255.224

Executive management = 20 hosts

NA: 192.168.100.160/27

BA: 192.168.100.191/27

SM: 255.255.255.224

* Network add. : All network bit as it is, all host bit 0
* Broadcast add. : All network bit as it is, host bit all 1
* Subnet Mask : All network bit 1, all host bit 0

A.B.C.D/X ← NA + SB

ex. 192.168.10.0/24 , a class C ID

192.168.10.0/28 ← (24 + 4)

$2^4 - 2 = 14$ hosts

11000000.10101000.00001010.0000 0000

Network | Subnet | Host

∴ NA : 192.168.10.0/28
BA : 192.168.10.15/28
1st host : 192.168.10.1/28
last host : 192.168.10.14/28
SM : 255.255.255.240

16. Cryptography:

Technique to encrypt plain text as to make it difficult to understand.

Some common algorithms are:

- Secret key
- Public key
- Message digest

Secret key encryption: Sender and reciever has secret key

Public key encryption: Every user has a secret a secret key
Not possible in shared domain

Message digest: Real data is not sent. Rather symbolic data is sent, where the reciever decrypts it.
Example: MD-5 hashing.