

Computer Networks
2nd Year, 1st Semester
2020

Tutorial 3 – VLSM and IPv6

01. An ISP supplies a class C network of 195.100.50.0 to an enterprise that requires 5 networks each to support 12 users and 4 WAN links with 2 usable ip addresses.

a. What is the subnetmask mask that would be configured in each workstation ?

/28

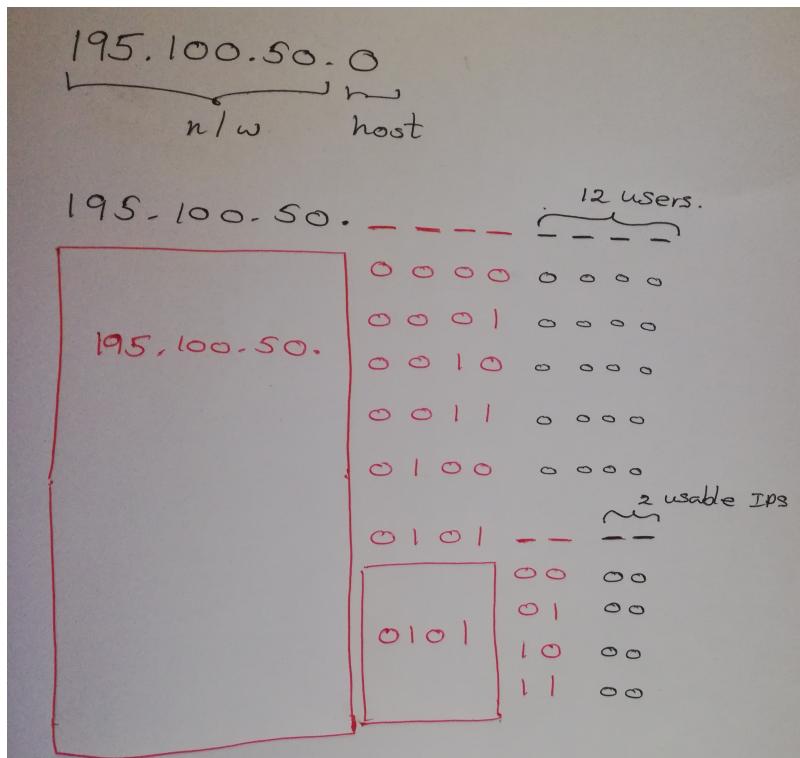
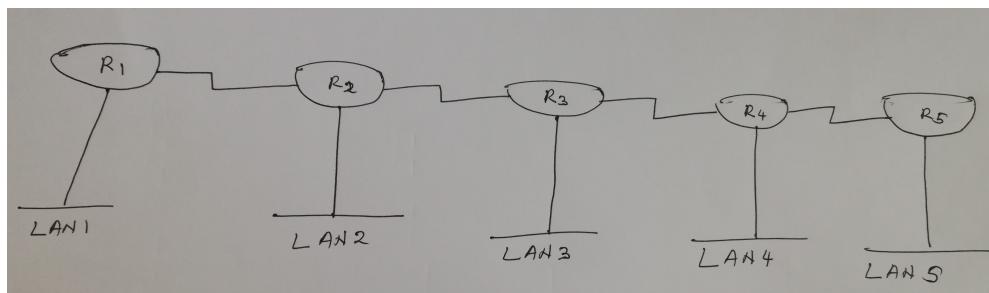
11111111. 11111111. 11111111. 1111 0000 → 255.255.255.240

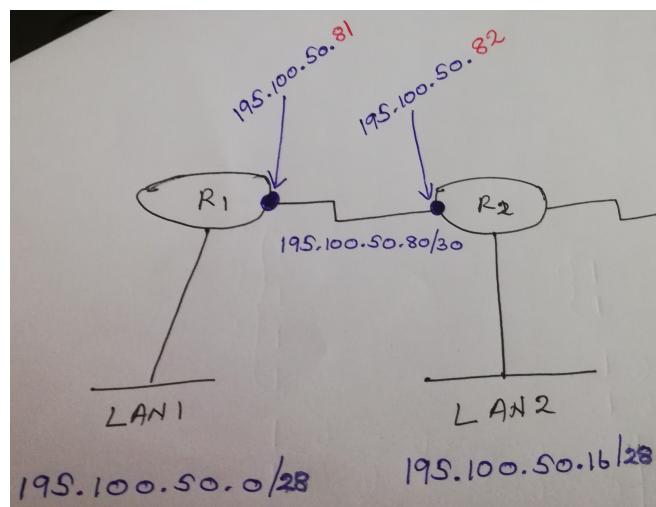
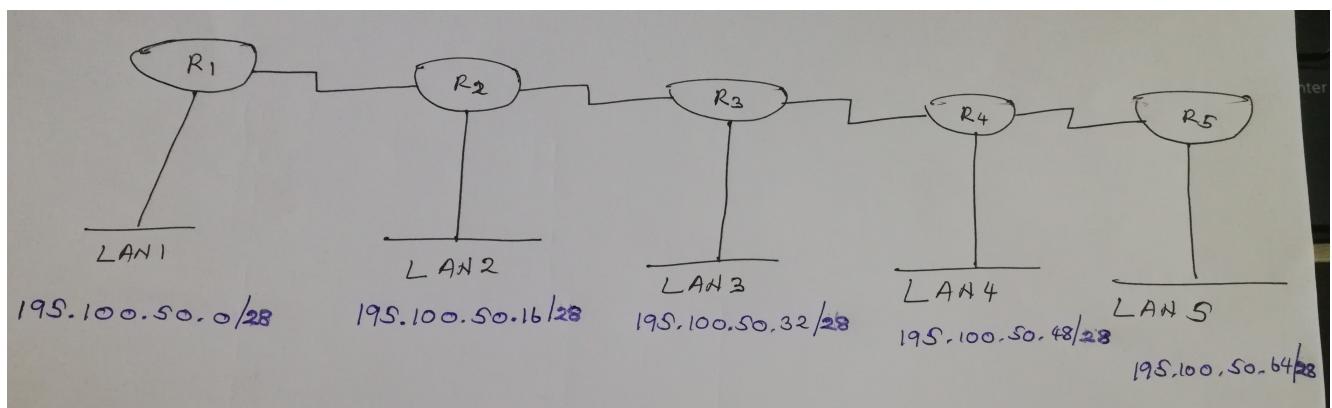
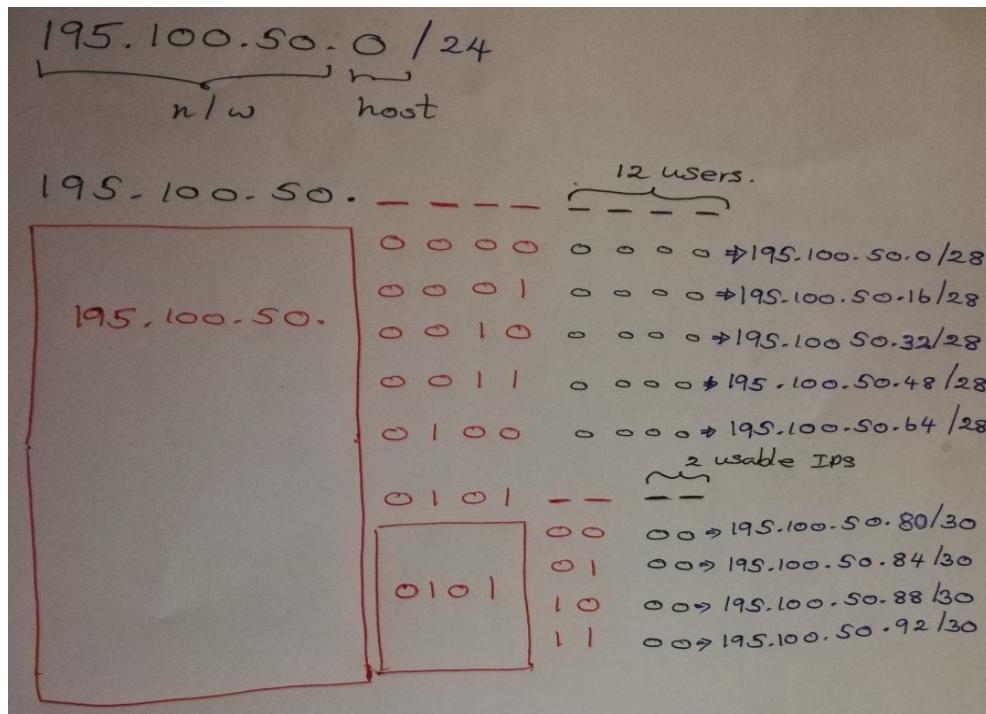
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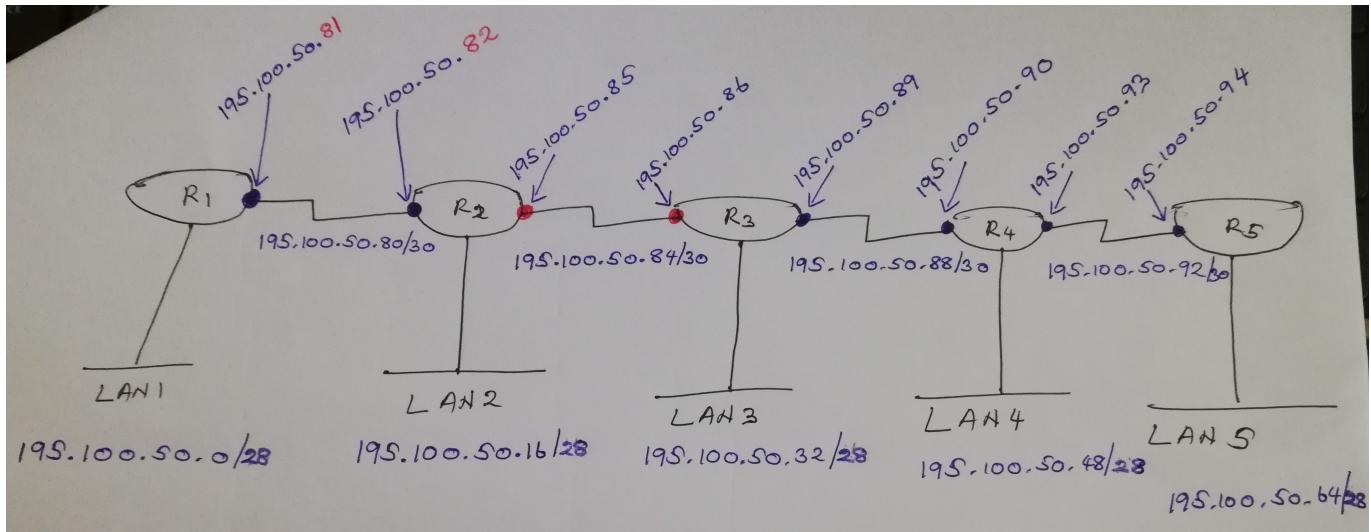
11111111. 11111111. 11111111. 1111 11 00 → 255.255.255.252

b. Identify the sub-network addresses.

c. Calculate the WAN Link addresses.







02. 132.16.128.0/17 main network need to be separated into subnetworks based on the following requirements.

- a. 3 subnets with 25 devices each.
- b. 4 WAN links to inter-connect the sub networks

132.16.128.0/17
132.16.1 0000000.00000000

For 25 devices, 5 host bits are needed

132.16.1 0000000.000 **00000**
3 subnet IDs → 0000000.000
0000000.001
0000000.010

Subnet addresses

132.16.128.0 /27
132.16.128.32/27
132.16.128.64 /27

For WAN links next available subnet will be used:

132.16.1 0000000 . 011 _____

WAN link needs 2 IP addresses. Two host bits are enough.

132.16.1 0000000 . 011 _____

FOUR WAN Links

132.16.1 0000000 . 011	0	0	0	0	0	0
132.16.1 0000000 . 011	0	0	0	0	0	0
132.16.1 0000000 . 011	0	0	1	0	0	0
132.16.1 0000000 . 011	0	1	0	0	0	0
132.16.1 0000000 . 011	0	1	1	0	0	0

WAN Addresses

132.16.128.96/30
132.16.128.100/30
132.16.128.104/30
132.16.128.108/30

03. An ISP supplies a class B network of 136.210.0.0 to an enterprise that requires ten networks each to support 110 users. What is the subnet mask that would be configured in each workstation?

Only 7 bits are needed to support 110 users

136.210. [] .
255.255.1 1 1 1 1 1 1 1.1 0 0 0 0 0 0 → 255.255.255.128

04. Calculate the EUI-64 interface ID for IPv6 address for the following device MAC addresses.

- a. 3463:adad:adad

3463:ad ad:adad → Separate into 2 parts

3 4 63:ad FF : FE ad:adad → Insert FFFE

0011 0100 → 0011 0110 → Toggle the 7th Bit

3663:adff:fead:adad

- b. 2C55:CAFE:ABCD

2C55:CA FE:ABCD → Separate into 2 parts

2 C 55:CA FF : FE FE:ABCD → Insert FFFE

0010 1100 → 0010 1110 → Toggle the 7th Bit

2D55:CAFF:FEFE:ABCD

05. Write the simplified version of the following IPv6 addresses.

- a. 2001:0db8:85a3:0000:0000:8a2e:0370:7334

2001:db8:85a3::8a2e:370:7334

- b. 2001:0000:85a3:0000:0000:8a2e:0370:7334

2001:0:85a3::8a2e:370:7334

OR

2001::85a3:0:0:8a2e:370:7334

06. Calculate the original IPv6 address of the following compressed IPv6 addresses.

- a. 52:8d30:0:2345::190

0052:8d30:0000:2345:0000:0000:0000:0190

- b. a052:30::3567:0:0:cd9

a052:0030:0000:0000:3567:0000:0000:0cd9

- c. a052:30:3:40:3567:5640::

a052:0030:0003:0040:3567:5640:0000:0000