Lab 1 : Implementation of IP VLSM Addressing Plan

Introduction

VLSM is a Variable Length Subnet Mask in which the subnet design uses more than one mask in the same network which means more than one mask is used for different subnets, or a network.

Lab Scenario

You are the network administrator for a small company. The company has the following departments and requirements:

Management: 30 hosts

Sales: 60 hosts (increased from 50)

IT: 20 hosts

HR: 10 hosts

Finance: 15 hosts

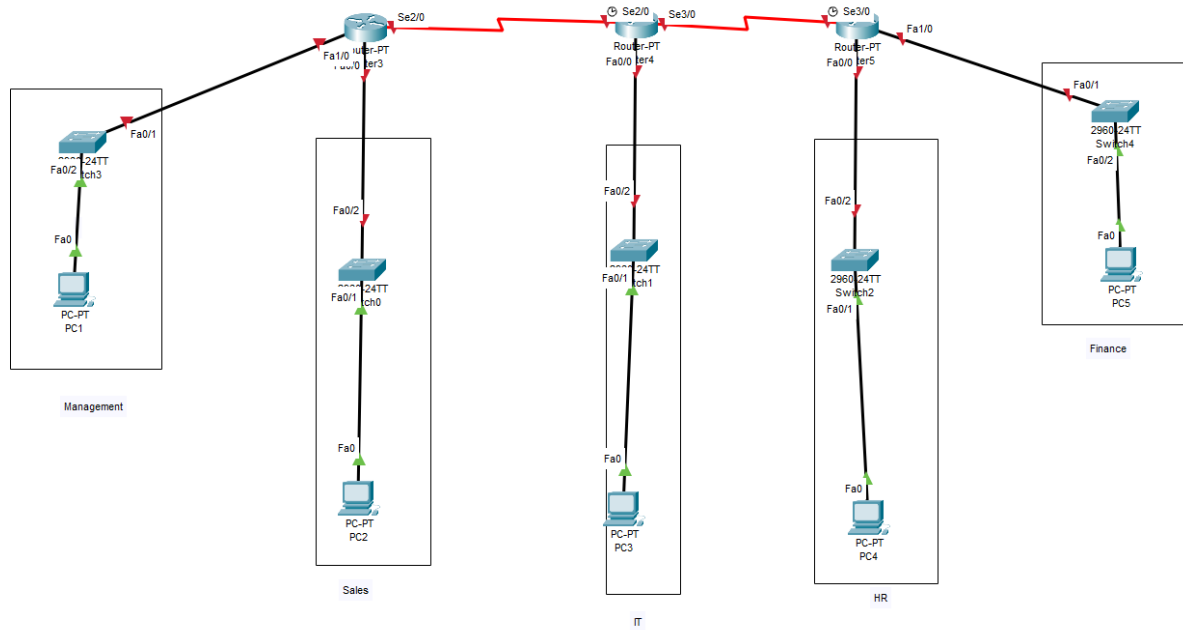The company has been allocated the IP address block 192.168.1.0/24.

Demanded Task

Design an VLSM (Variable-Length Subnet Mask) plan to accommodate all departments.

Step 1: First, open the cisco packet tracer desktop and select the devices given below:

S.NO	Device	Model-Name	Qty.
1.	pc	pc	5
2.	switch	PT-Switch	5
3.	router	PT-Router	3

Then draw the following topology

step 2 complete the IP Addressing Table

Subnet	Subnet Mask	Number of max host	Network address	First valid address	Last valid address	Broadcast address
Sales (60 host)						
Management 30 host)						
IT (20 h)						
Finance (15 h)						
HR (10 h)						
R0-R1 (2 h)						
R1-R2 (2 h)						

step 3 :

Configure the PCs (hosts) with IPv4 address and Subnet Mask according to the IP addressing table completed above.

Step 3: Configure router with IP address and subnet mask such that the address of the router interface is the first otherwise the second valid address in each subnet

S.NO	Device	Interface	IPv4 Address	Subnet mask
1.	router0	FastEthernet0/0		
		FastEthernet0/1		
		Serial2/0		
2.	router2	FastEthernet0/0		
		Serial2/0		
		Serial3/0		
3.	router3	FastEthernet0/0		

		FastEthernet0/1		
		Serial2/0		

Step 4: After configuring all of the devices we need to assign the routes to the routers.

To assign static routes to the particular router:
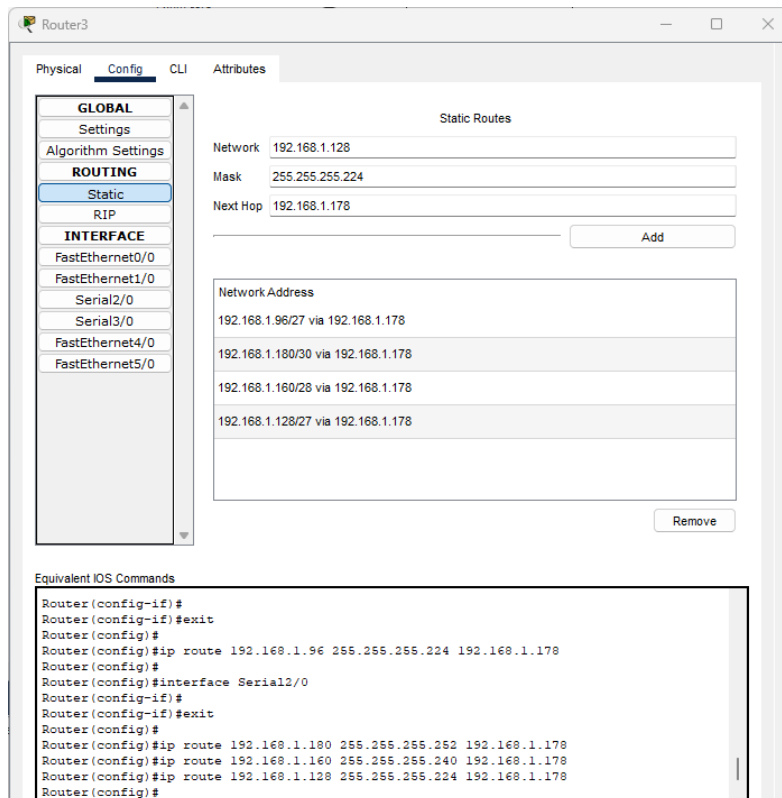
or using CLI : ip route <network> <mask> <next hop>

Step 5: Verifying the network by pinging the IP address of any PC.

we will use the ping command to do so.

- First, click on PC0 then Go to the command prompt.
- Then type ping <IP address of targeted node>.

- As we can see in the below image we are getting replies which means the connection is working.

PC1 — □ ✕

Physical   Config   Desktop   Programming   Attributes

Command Prompt   X

Reply from 192.168.1.182: bytes=32 time=4ms TTL=253
Reply from 192.168.1.182: bytes=32 time=30ms TTL=253
Reply from 192.168.1.182: bytes=32 time=36ms TTL=253
Reply from 192.168.1.182: bytes=32 time=27ms TTL=253

Ping statistics for 192.168.1.128:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 36ms, Average = 24ms

C:\>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.130: bytes=32 time=18ms TTL=125
Reply from 192.168.1.130: bytes=32 time=29ms TTL=125
Reply from 192.168.1.130: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 29ms, Average = 16ms

C:\>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Reply from 192.168.1.130: bytes=32 time=43ms TTL=125
Reply from 192.168.1.130: bytes=32 time=18ms TTL=125
Reply from 192.168.1.130: bytes=32 time=16ms TTL=125
Reply from 192.168.1.130: bytes=32 time=33ms TTL=125

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 16ms, Maximum = 43ms, Average = 27ms

C:\>

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Reply from 192.168.1.182: bytes=32 time=4ms TTL=253
Reply from 192.168.1.182: bytes=32 time=30ms TTL=253
Reply from 192.168.1.182: bytes=32 time=36ms TTL=253
Reply from 192.168.1.182: bytes=32 time=26ms TTL=253