Lab Sheet – 06

Title: Internet Protocol version 4 (IPv4) Subnet

Aim:

- IP addressing scheme.
- Getting familiar with IPv4 subnets
- Configure devices with IPv4 after subnetting.

Task:

- Design an IP scheme.
- Subnet the IPv4 address
- Assign IP address to Network devices and verify connectivity.

Use "NST21022 Labsheet 06.pka" file

Activities

Exercise 01: Subnet the 172.16.1.0/24 network into the appropriate number of subnets.

1. Based on the topology, how many subnets were needed?
2. How many bits must be borrowed to support the number of subnets in the topology table?
3. How many subnets does this create?

Exercise 02: Fill the subnet table.

Subnet Number	Network Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Exercise 03: Configure IP address according to following criteria.

1. Assign the subnets to the network shown in the topology.
    a. Assign Subnet 1 to the LAN connected to the GigabitEthernet 0/0/0 interface of R1:

b. Assign Subnet 2 to the LAN connected to the GigabitEthernet 0/0/1 interface of R1:
c. Assign Subnet 3 to the LAN connected to the GigabitEthernet 0/0/0 interface of R2:
d. Assign Subnet 4 to the LAN connected to the GigabitEthernet 0/0/1 interface of R2:
e. Assign Subnet 5 to the LAN connected to the GigabitEthernet 0/0/0 interface of R3:
f. Assign Subnet 6 to the LAN connected to the GigabitEthernet 0/0/1 interface of R3:
g. Assign Subnet 7 to the LAN connected to the GigabitEthernet 0/0/0 interface of R4:
h. Assign Subnet 8 to the LAN connected to the GigabitEthernet 0/0/1 interface of R4:
i. Assign Subnet 9 to the LAN connected to the GigabitEthernet 0/0/0 interface of R5:
j. Assign Subnet 10 to the LAN connected to the GigabitEthernet 0/0/1 interface of R5:
k. Assign Subnet 11 to the WAN ling between R1 to R2:
l. Assign Subnet 12 to the WAN ling between R2 to R3:
m. Assign Subnet 13 to the WAN ling between R3 to R4:
n. Assign Subnet 14 to the WAN ling between R4 to R5:
o. Assign Subnet 15 to the WAN ling between R5 to R1:

2. Fill the addressing table using following guidelines:
    a. Assign the first usable IP addresses in each subnet to all LAN link in all routers.
    b. Assign the first usable IP addresses in each subnet for the WAN links as follows.
        R1 - S0/1/0
        R2 - S0/1/1
        R3 - S0/1/0
        R4 - S0/1/1
        R5 - S0/1/0
    c. Assign the last usable IP addresses in each subnet for the WAN links as follows.
        R1 - S0/1/1
        R2 - S0/1/0
        R3 - S0/1/1
        R4 - S0/1/0
        R5 - S0/1/1
    d. Assign the second usable IP address in the attached subnets to the switches.
    e. Assign the third usable IP address to the PCs in each subnet.

Addressing Table

Devices	Interfaces	IP Addresses	Subnet Mask	Default Gateway
R1	G0/0/0			
	G0/0/1			
	S0/1/0			
	S0/1/1			
R2	G0/0/0			
	G0/0/1			
	S0/1/0			
	S0/1/1			
R3	G0/0/0			
	G0/0/1			
	S0/1/0			
	S0/1/1			
R4	G0/0/0			
	G0/0/1			
	S0/1/0			
	S0/1/1			
R5	G0/0/0			
	G0/0/1			
	S0/1/0			
	S0/1/1			
S1	VLAN1			
S2	VLAN1			
S3	VLAN1			
S4	VLAN1			
S5	VLAN1			
S6	VLAN1			
S7	VLAN1			

S8	VLAN1			
S9	VLAN1			
S10	VLAN1			
PC-1	NIC			
PC-2	NIC			
PC-3	NIC			
PC-4	NIC			
PC-5	NIC			
PC-6	NIC			
PC-7	NIC			
PC-8	NIC			
PC-9	NIC			
PC-10	NIC			

3. Assign IP addresses to network devices and verify connectivity.