

VASAVI COLLEGE OF ENGINEERING

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DEPARTMENT OF

: ECE

NAME OF THE LABORATORY : Computer Networks

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Subnet an IPV4 Network (11.5.5)

Aim:- To subnet an IPV4 network using cisco packet tracer

Apparatus:- A PC loaded with cisco packet tracer

Procedure:-

Part 1:- Subnet the Assigned Network.

Step 1:- Create a subnetting scheme that meets the required number of host addresses (192.168.0.0/24 address space)

(a) The first subnet is the LAN-A network. You need a minimum of 50 host IP addresses.

click on router → open command prompt
Router>

Router>en

Router (config)# int g0/0

Router (config-if) ip address 192.168.0.1 255.255.255.192

Router (config-if) # no shutdown

(b) The second subnet is the LAN-B network. You need a minimum of 40 host IP addresses

Router>

Router>enable

Router# config t

Router (config)# int g0/1

Router (config-if) # ip address 192.168.0.65 255.255.255.192

Router (config-if) # no shutdown

Addressing Table:-

Device	Interface	IP Address	Subnet Mask	Default
R1	Gi0/0	192.168.100.1	255.255.255.224	N/A
	Gi0/1	192.168.100.33	255.255.255.224	N/A
	So/0	192.168.100.129	255.255.255.224	N/A
R2	Gi0/0	192.168.100.65	255.255.255.224	N/A
	Gi0/1	192.168.100.97	255.255.255.224	N/A
	So/0/0	192.168.100.58	255.255.255.224	N/A
S1	VLAN1	192.168.100.2	255.255.255.224	192.168.100.1
S2	VLAN1	192.168.100.34	255.255.255.224	192.168.100.33
S3	VLAN1	192.168.100.66	255.255.255.224	192.168.100.65
S4	VLAN1	192.168.100.98	255.255.255.224	192.168.100.97
PC1	NIC	192.168.100.30	255.255.255.224	192.168.100.1
PC2	NIC	192.168.100.62	255.255.255.224	192.168.100.33
PC3	NIC	192.168.100.94	255.255.255.224	192.168.100.65
PC4	NIC	192.168.100.126	255.255.255.224	192.168.100.97

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→ The subnet is made up of two portions, the network portion, and the host portion. This is represented in the binary by 1's and 0's in the subnet mask.

→ To subnet a network, bits from the host portion of the original network mask are changed into subnet bits.

The number of subnet bits defines the number of subnets.

Step 2: Fill in the missing IP addresses in the addressing table

(a) Assign the first subnet to LAN-A

(1) Use the first host address for the Customer Router Interface connected to LAN-A switch

(2) Use the second host address for the LAN-A switch. Make sure to assign a default gateway address for the switch.

(3) Use the last host address for PC-A. Make sure to assign a default gateway address for the PC

Switch>en

Switch #config t

Switch (config)#int vlan 1

Switch (config-if)#ip address 192.168.0.2 255.255.255.255

Switch (config-if)#no shutdown

Switch (config-if)#exit

Switch (config)#ip default gateway 192.168.0.1

Subnet	Network Address	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	192.168.100.0	0	0	0	0	0	0	0	0
1	192.168.100.1	0	0	1	0	0	0	0	0
2	192.168.100.2	0	1	0	0	0	0	0	0
3	192.168.100.3	0	1	1	0	0	0	0	0
4	192.168.100.4	1	0	0	0	0	0	0	0

First Octet	Second Octet	Third Octet	Mask bit 7	Mask bit 6	Mask bit 5	Mask bit 4	Mask bit 3	Mask bit 2	Mask bit 1	Mask bit 0
11111111	11111111	11111111	1	1	1	0	0	0	0	0
First Decimal Octet	Second Decimal Octet	Third Decimal Octet	Fourth Decimal Octet							
255	255	255	224							

Subnet Table :-

Subnet Number	Subnet Address	First Usable Host Address	Last Usable Host Address	Broadcast Address
0	192.168.100.0	192.168.100.1	192.168.100.30	192.168.100.31
1	192.168.100.32	192.168.100.33	192.168.100.62	192.168.100.63
2	192.168.100.64	192.168.100.65	192.168.100.94	192.168.100.95
3	192.168.100.96	192.168.100.97	192.168.100.126	192.168.100.127
4	192.168.100.128	192.168.100.129	192.168.100.158	192.168.100.159
5	192.168.100.160	192.168.100.161	192.168.100.190	192.168.100.191
6	192.168.100.192	192.168.100.193	192.168.100.222	192.168.100.223
7	192.168.100.224	192.168.100.225	192.168.100.254	192.168.100.255

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b) Assign the second subnet to LAN-B

(1) Use the first host address for the customer Router interface connected to LAN-B switch

(2) Use the second host address for the LAN-B switch. Make sure to assign a default gateway address for switch.

(3) Use the last host address for PC-B. Make sure to assign a default gateway address for the PC.

Switch>en

Switch#config t

Switch(config)# int vlan1

Switch(config-if)#ip address 192.168.0.6.6 255.255.255.255

Switch(config-if)#no shutdown

Switch(config-if)#exit

Switch(config)#ip defaultgateway 192.168.0.65

Go to PC-A & configure the following IP.

IP address - 192.168.0.62

Subnet mask - 255.255.255.192

Default gateway - 192.168.0.1

DNS server - 0.0.0.0

Go to PC-B & configure the following IP

IP address - 192.168.0.126

Subnet mask - 255.255.255.192

Default gateway - 192.168.0.65

DNS server - 0.0.0.0

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Part 2: Configure the devices

Step 1: Configure Customer Router

- set the enable secret password on Customer Router to class123
- set the console login password to cisco123
- configure customer Router as the host name for the router
- configure the g0/0 and g0/1 interfaces with IP addresses and subnet masks and then enable them
- save the running configuration to the startup configuration file

Go to customer Router

```
Router>enable
```

```
Router#config t
```

```
Router(config)# hostname CustomerRouter
```

```
CustomerRouter(config)# enable secret class123
```

```
CustomerRouter(config)# line console 0
```

```
CustomerRouter(config)# password cisco123
```

```
CustomerRouter(config)# login
```

```
CustomerRouter(config)# exit
```

```
CustomerRouter# copy running-config startup-config
```

Step 2: Configure the two customer LAN switches

configure the IP address on interface VLAN11 on the two customer LAN switches. Make sure the configure the correct default gateway on each switch

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Step 3: Configure the PC interface
Configure the IP address, subnet mask, and default gateway setting on PC-A & PC-B as mentioned in previous page.

Part 3:- Test & Troubleshoot the network

In this use the ping command to test network connectivity.

- Determine if PC-A can communicate with its default gateway
- Determine if PC-B can communicate with its default gateway
- Determine if PC-A can communicate with PC-B

Result :-

Subnetting an IPV4 network is performed using Cisco Packet Tracer.