

Lab 4 - Implementation of static Routing

Theory

static Routing

The process of adding static routes to the routing table is known as static routing. In this lab, each network has two routers per reach. It enables routers to specific path to each network segmented to keep track a netw

Step 1: First search PC, switch and router in C is co packe trace.

Step 2: Assign IP address for each PC.

Step 3: Configure router with IP address and subnet mask

Step 4: After configue all frame , allign routes to router.

Step 5: We send "from PC0 to PC2

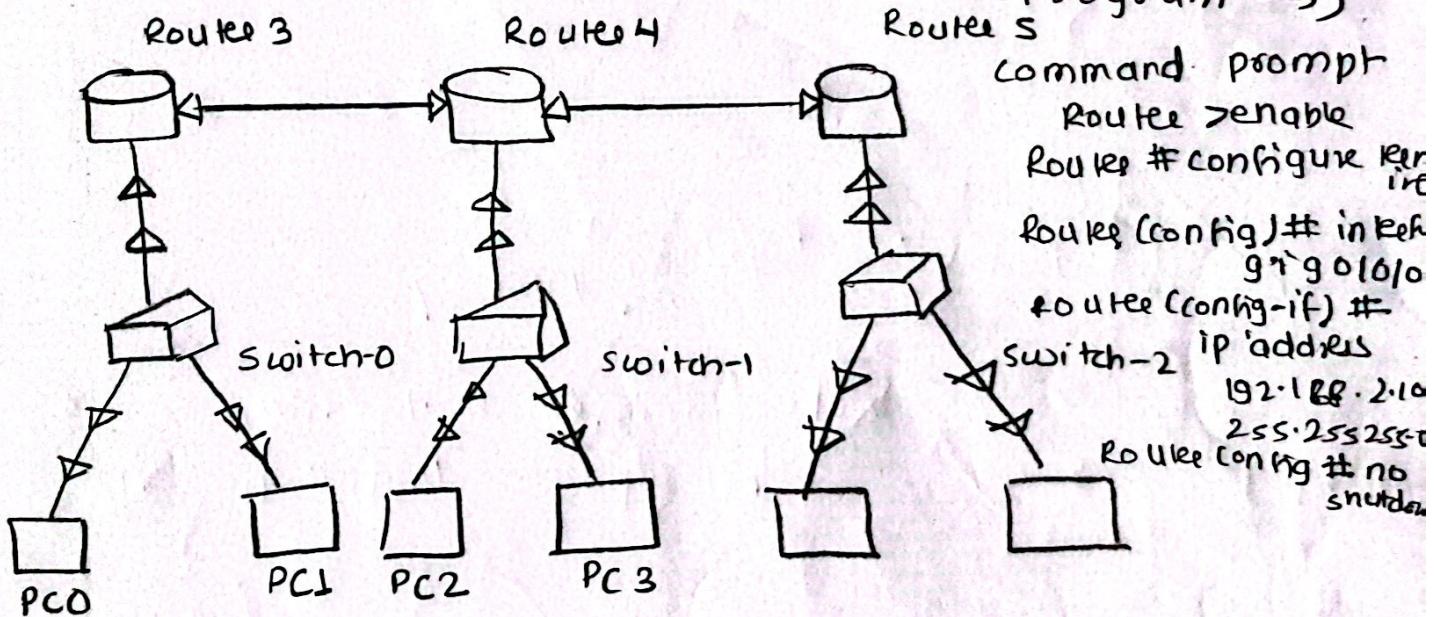


Fig: static Routing configuration

Conclusion

In this lab static routing was successfully implemented to connect three router networks. The activity provides with configure routing tables and understand advantages & limitation of static routing.

Program

Router #en
Router # configure terminal
Enter configuration commands one per line. END with control-Z
Router (config) # interface serial 0/1/0
Router (config-ip) # ip address 192.168.5.2 255.255.255.0
Router (config-if) # no shutdown
Router (config-if) #
%.LINK-5-CHANGED: interface serial 0/1/0. changed state to up
Router (config-if) #end
Router #
%.SYS-5-CONFIG-I: configured from console by console
Router #en
Router # enable
Router # configure terminal
Enter configuration commands one per line
Router (config) # ip route 192.168.1.0 255.255.255.0 192.168.4.2
Router (config) # ip route 192.168.2.0 255.255.255.0 192.168.2.0
Router (config) # ip route 192.168.3.0 255.255.255.0 192.168.5.1
Router (config) # ip route 192.168.4.0 255.255.255.0 192.168.5.1
Router (config) # exit

Lab 5: Implementation of Dynamic Routing

Theory

Dynamic routing is technique of finding the path for data to travel over a network in this process, a router can transmit data through various different routers and reach its destination on the basis of communication circuits.

First, a routing protocol must be installed in each router in the network to share information among each route.

Second it is started manually to go the first routing table of the router in route information and then after that it goes on automatically with the help of dynamic routing algorithm and dynamically forms routing table for rest the routes in network.

Third, the routing network information is exchanged among routers so if the network goes down or fails to work to share information with its connected routers then the routing table of each route is modified correctly to present condition so it never fails to derive information to destination.

Fourth, hosts are presented to check default gateway to IP address of local router.

Command for route configuration

Router >enable

Router # configure terminal

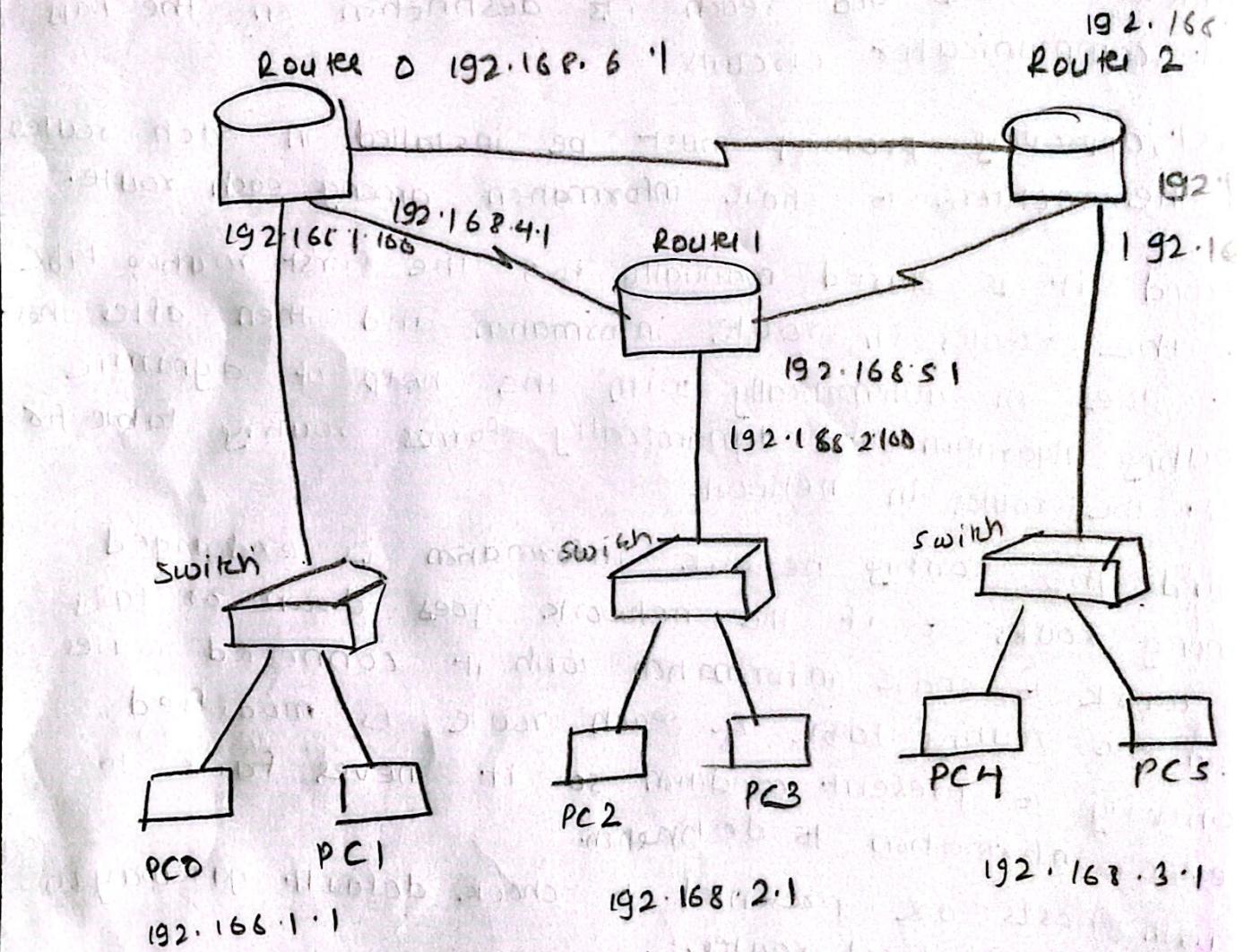
Router (config) # interface gig 0/0/0

Router (config-if) # ip address 192.168.2.100 255.255.255.0

Router (config-if) # no shutdown

Tracing path

C:\> tracert 192.168.3.1



1	1ms	2ms	0ms	192.168.1.100
2	0ms	0ms	5ms	192.168.6.2
3 *	*	0ms	0ms	192.168.3.1

Conclusion

In this lab dynamic routing was successfully implemented to connect three router networks. Activity provides hands on experience with configuring route & understand dynamic routing & tracing the path.

THEORY

The VLAN is a logical grouping of devices within a network segmented for better traffic management and security. Devices in some VLAN can communicate as if they are in some physical LAN, even if they are on different switches.

key concepts

- * **VLAN ID** → A unique identifier for each VLAN (eg VLAN10)
- * **Access ports** → ports assigned to specific VLAN
- * **Trunk ports** → ports that carry traffic for multiple VLAN between switches or routers
- * **Routes on sticks** → A router configuration method used for intra VLAN routing.

PROGRAM

```
switch >enable  
switch #configure terminal  
switch (config) # do show VLAN  
switch (config) # VLAN 10.  
switch (config-VLAN) # name CNP  
switch (config-VLAN) # VLAN 20  
switch (config-VLAN) # name T  
# do show VLAN  
# VLAN 10  
switch (config-VLAN) # VLAN 10  
switch (config-VLAN) # interface fa 0/1  
switch (config-VLAN) # switch port mode access  
# switch port access, VLAN 10  
switch (config-VLAN) # interface fa 0/2  
    # switch port mode access  
    # switch port mode access VLAN10  
    # interface fa 0/3  
    # switch port mode access  
    # switch port mode access VLAN 10
```

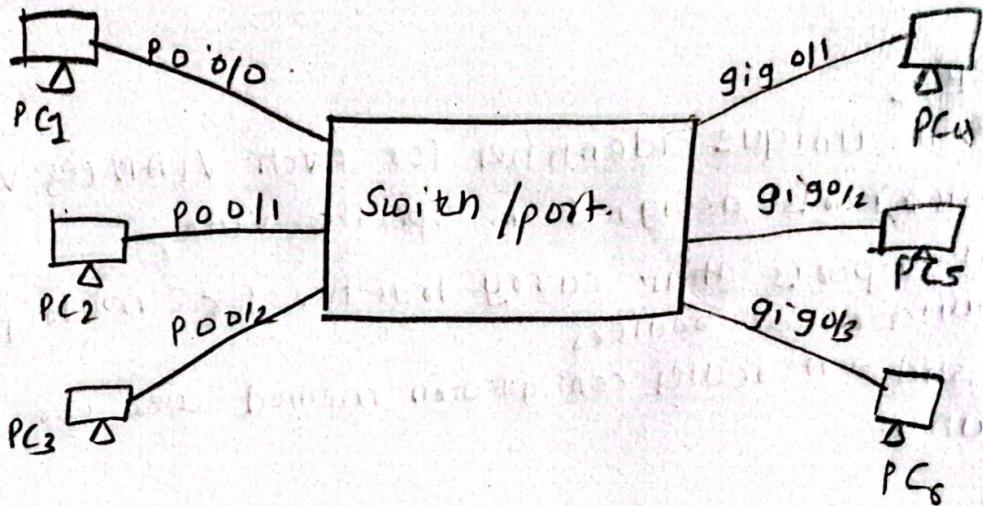


Fig : VLAN configuration

VLAN 20

```
# interface gig 0/0
# switch port mode access
# switch port mode access VLAN20
# interface gig 0/2
# switch port mode access
# switch port mode access VLAN20
# interface gig 0/3
# switch port mode access
# switch port mode access VLAN20.
```

DISCUSSION & CONCLUSION

We have learned to configure VLAN of different identifiers. VLAN were successfully configured to separate traffic between two group of PCs. Inter-VLAN routing enabled communication between VLANs, verifying router on sticker setup.

AB 7: Connection of router, switch, PC in VLAN configuration

Theory

VLAN is a group of end station in a switched network that is logically segmented by function input regard to the physical location of the users.

VLAN create a logical separation between switch ports; essentially each VLAN behaves like a separate physical switch.

command

Router >enable

Route # configure terminal

Route (config)# interface gig 0/0.10

Route (config-subif)# encapsulation dot 1Q 10

Route (config-subif)# ip address 192.168.1.100 255.255.255.0

Route (config-subif)# end

Route (config-subif)# encapsulation no 1Q 20

Route (config-subif)# ip address 192.168.2.100 255.255.255.0

Route (config-subif)# end

switch (config)# interface fa 0/1

switch (config-if)# switch mode from

switch (config-if)# end

switch (config-if)# interface fa 0/7

switch (config-if)# switchport mode access

switch (config-if)# switchport access VLAN 20

switch (config-if)# to show VLAN

switch (config-if)# interface fa 0/6

switch (config-if)# switchport mode access

switch (config-if)# switchport access VLAN 20

switch (config-if)# to show VLAN

switch (config-if)# interface fa 0/5

switch (config-if)# switchport mode access

switch (config-if)# switchport access VLAN 20

switch (config-if)# interface fa 0/4

switch (config-if)# switchport mode access

switch (config-if)# switchport access VLAN 10

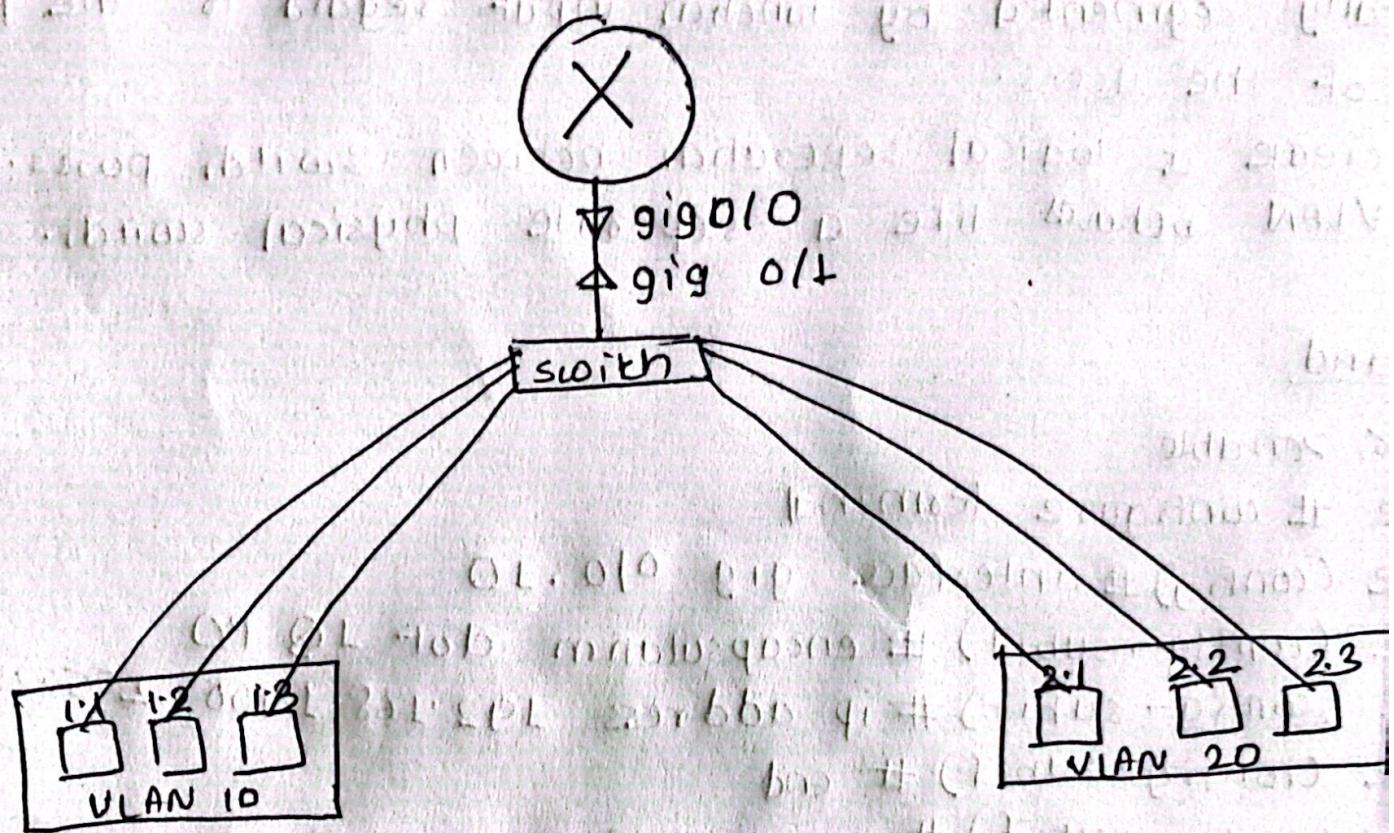


Fig: VLAN configuration.

```
switch (config-if)# interface fa 0/3.  
switch (config-if)# switchport mode access  
switch (config-if)# switchport access VLAN 10  
Route (config)# interface fa 0/1-20  
Route (config)# interface
```

Conclusion and conclusion

Thus, VLAN setup was effectively connect routers, switch and PCs, improving network security and performance through traffic segmentation and efficient inter VLAN communication.

AB2: Router configuration , use of packet tracer or other simulation software.

Theory: Router configuration is the process of setting up a router to ensure efficient data routing. This can include interface IP routing, routing configuration.

For efficient data routing , thus can include interfaces IP routing.

CISCO packet tracer is a free cross platform tool that simulates computer network & it is used for teaching & learning networking concept. In simulation mode we can watch our network run at a slower pace observing the path that packet trace & inspecting them in details.

Program

Router >enable

Router > #configuration terminal

Enter configuration commands one per line with

Router >(config) # interface gig 0/0/0

Router (config-if) # ip address 192.168.2.4 255.255.255.0

Router (config-if) # no shutdown

Router (config-if) # end

Router #

-i.link-5-CHANGED :Interface gigabit ethernet 0/0 .changed

State to up.

-i.SYSRn -config-I :Configured from console by console.

CONCLUSION

→ Hence. in the lab we successfully connected different PC with a switch & passage passed once PC to another through switch.

LAB : NETWORK TESTING, PINGPONG, NETSTAT , NSLOOKUP , IPCONFIGURATION TRACEROUTE

① PING : For to see if a network device is reachable

② NSLOOKUP : Enter hostname & findout the corresponding IP address & vice versa.

③ NETSTAT : Monitor network connections

- Show network status & protocol.

④ IPCONFIG : To provide detailed information about your computer's network system.

⑤ TRACERT : Tracert is a command line tool that shows the path data takes from a source to a destination on the internet.

Program

Router > enable

Router # Configuration terminal

Enter configuration commands, one per line (End with NTCI)

Router(config) # interface gig0/0

Router(config-if) # IP address 192.168.2.100 255.255.255.0

Router(config-if) # no shutdown

Router(config-if) #

-1.link->-changed: Interface GigabitEthernet 0/0, changed state to UP

-1.Line PROTO-S-UPdown + line Protocol on interface .Gigabit-Ethernet 0/0 changed state to UP

Router(config-if) # end.

Router #

-1.SYS-S-config-I : Configured from console by console.

For PC2

Packet tracer PC command line L-0

C:\>ping 192.168.1.5

Pinging 192.168.1.5 with bytes 32 bits of data

Reply from 192.168.1.5 bytes = 32 time = 8ms

TTL = 128

Reply from 192.168.1.5 bytes = 32 time = 4ms
TTL = 128

Reply from 192.168.1.5 bytes = 32 time = 4ms
TTL = 128

Reply from 192.168.1.5 bytes = 32 time = 9ms
TTL = 128

Ping Statistics for 192.168.1.5

packet sent = 4, received = 4, lost = 0 (0% loss)

Approximate round trip times in milliseconds

minimum = 4ms, maximum = 8ms, average = 5ms

CONCLUSION

→ From this lab we are able to know about router configuration & how to use packet tracer or other simulation software.