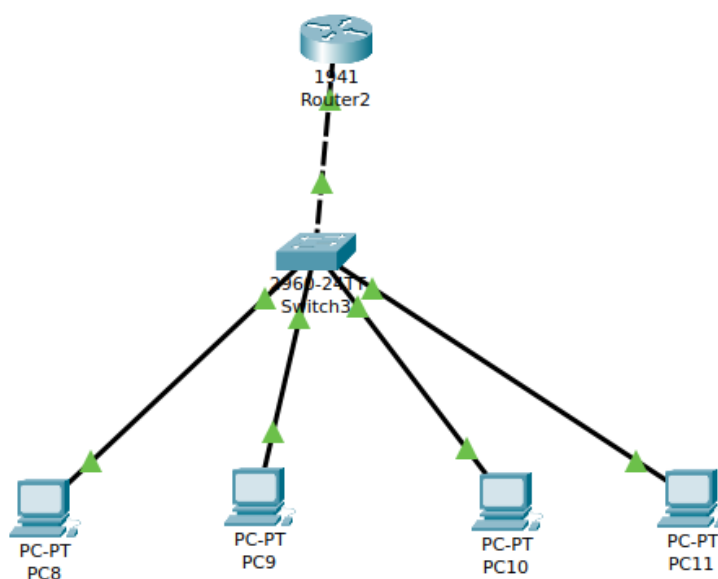
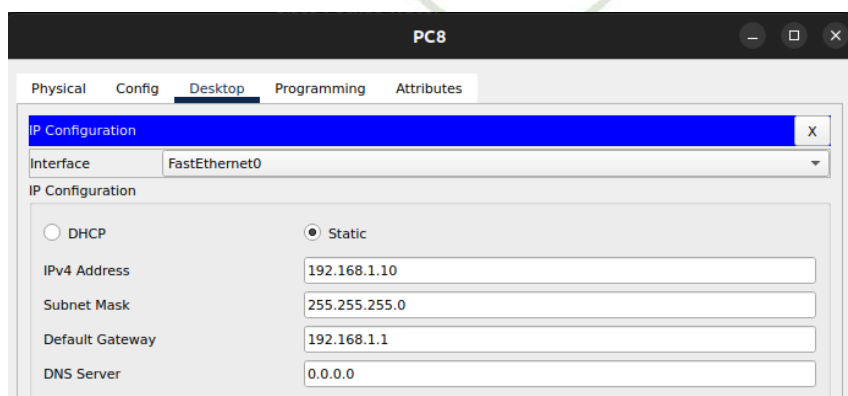


EXPERIMENT - 7**AIM :** Configuration of VLAN in Cisco switch**DESCRIPTION:**

VLAN (Virtual Local Area Network) is a way to logically divide a physical network into separate, isolated segments. This segmentation helps improve network efficiency, security, and management by grouping devices based on criteria like function or department, even if they share the same physical infrastructure. VLANs allow for better control of broadcast traffic, enhanced security, and increased flexibility in network design.

VLAN in Cisco switch :

- Open packet tracker.
- At the bottom we can find many options such as network devices, end device, components, connections etc.
- Select end devices and then choose 4 PCs, a switch-PT and a router- 1941.
- Connect all the devices as shown in the below figure, using connecting wires.
- Change the configuration of the devices accordingly.

Configuration of VLAN :**Configuration of PC8 :**

Configuration of PC9 :

PC9

Physical Config Desktop Programming Attributes

IP Configuration X

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.1.20

Subnet Mask255.255.255.0

Default Gateway192.168.1.1

DNS Server0.0.0.0

Configuration of PC10 :

PC10

Physical Config Desktop Programming Attributes

IP Configuration X

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.2.10

Subnet Mask255.255.255.0

Default Gateway192.168.2.1

DNS Server0.0.0.0

Configuration of PC11 :

PC11

Physical Config Desktop Programming Attributes

IP Configuration X

InterfaceFastEthernet0

IP Configuration

☐ DHCP

☒ Static

IPv4 Address192.168.2.20

Subnet Mask255.255.255.0

Default Gateway192.168.2.1

DNS Server0.0.0.0

Configuration of switch:

```
Switch3
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#vlan 10
Switch(config-vlan)#name SALES
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name HR
Switch(config-vlan)#int range fa0/1-4
Switch(config-if-range)#switch mode access
Switch(config-if-range)#int fa0/1
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/2
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/3
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int fa0/4
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int G
Switch(config-if)#
^
% Invalid input detected at '^' marker.
Switch(config-if)#int Gig
Switch(config-if)#
^
% Invalid input detected at '^' marker.
Switch(config-if)#interface GigabitEthernet0/1
Switch(config-if)#switch mode trunk
Switch(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up
Switch(config-if)#interface fa0/5
Switch(config-if)#switch mode trunk
Switch(config-if)#
Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to down
```

Configuration of Router:

```
Router2
Router(config-if)#no shutdown
Router(config-if)#int GigabitEthernet0/0.10
Router(config-subif)#encapsulation dot1q 10
Router(config-subif)#ip address 192.168.1.1 255.255.255.0
Router(config-subif)#int GigabitEthernet0/0.20
Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.2.1 255.255.255.0
Router(config-subif)#
%SYS-5-CONFIG_I: Configured from console by console
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface GigabitEthernet0/0.10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.10, changed state to up
%LINK-5-CHANGED: Interface GigabitEthernet0/0.20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.20, changed state to up
```

RESULT:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Period
PC8	Successful	PC8	PC10	IC...	Blue	0.000	N
PC8	Successful	PC8	PC11	IC...	Green	0.000	N
PC9	Successful	PC9	PC10	IC...	Purple	0.000	N
PC9	Successful	PC9	PC11	IC...	Yellow	0.000	N

CONCLUSION:

We can see that the packet is successfully transmitted from PC8 to PC9. Thus the configurations and connections are correct.

EXPERIMENT -8

AIM: Develop different local area networks using GNS3. Connect two or more Local area networks. Explore various sub-netting options.

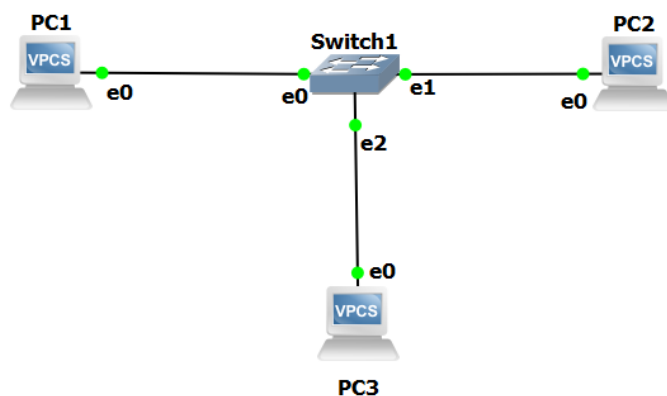
DESCRIPTION:

GNS3 stands for Graphical Network Simulator-3 which is an open source network software emulator that allows the combination of virtual and real networks, used to simulate complex network designs. It uses Dynamips emulation software to simulate Cisco IOS.

The resources utilized are 3 PCs, 1 switch.

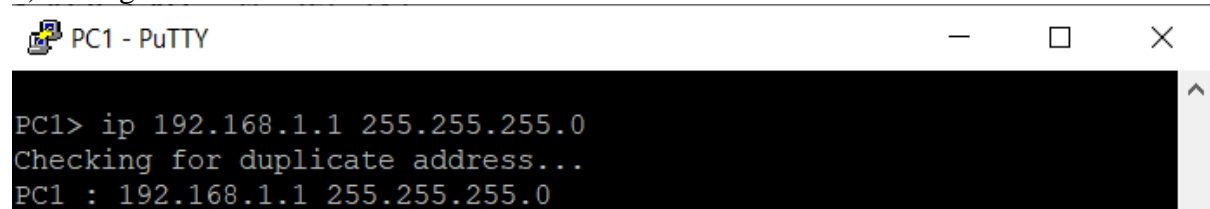
Steps to create GNS3 topology with 3 PC's and 1 Switch:

- 1) Click on **End devices** in the Devices Toolbar, drag and drop 3 instances of **VPCS** to the GNS3 Workspace
- 2) Click on **Switches** in the Devices Toolbar. Drag and drop the built-in ethernet switch
- 3) Click the **Add a Link** button, and add links from each PC to switch.
- 4) Click on the **Interface labels** button on the GNS3 Toolbar, which shows interfaces connected between devices.
- 5) Click the Green "Play" button on the GNS3 Toolbar to power on all devices in the topology.



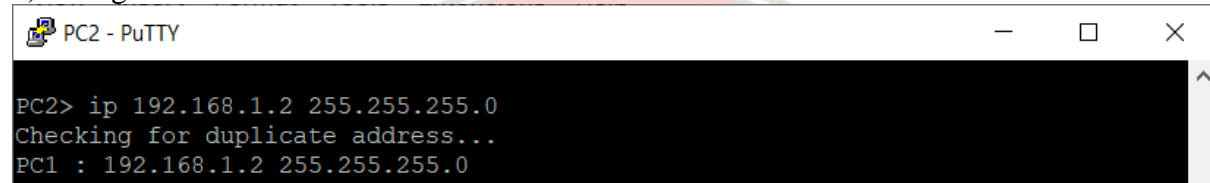
6) Click the **Console connect to all devices** button on the GNS3 Toolbar to open a connection to every device in the topology.

7) Configure PC1



```
PC1> ip 192.168.1.1 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0
```

8) Configure PC-2



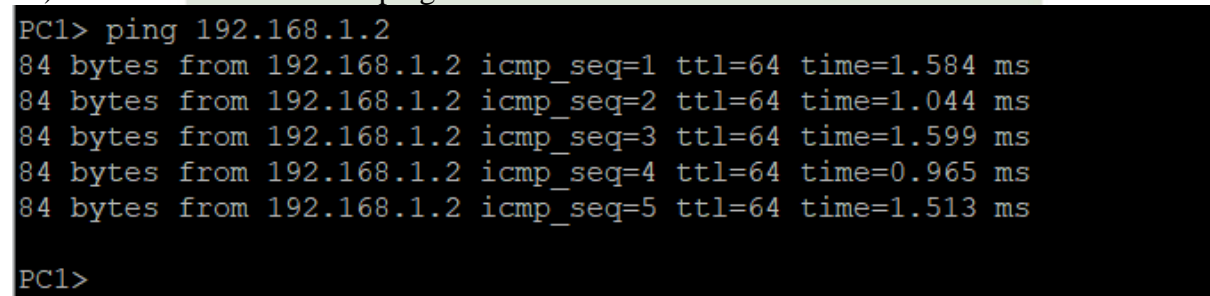
```
PC2> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0
```

9) Configure PC3



```
PC3> ip 192.168.1.3 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.3 255.255.255.0
```

10) Check whether PC1 can ping with PC2



```
PC1> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=1.584 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=1.044 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=1.599 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=0.965 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=1.513 ms

PC1>
```

11) Similarly, check with other PC's

RESULT: After the configuration and connection of all devices, the ping is successful between all the PC's

EXPERIMENT-9

AIM: Configure Static routing using GNS3 tool.

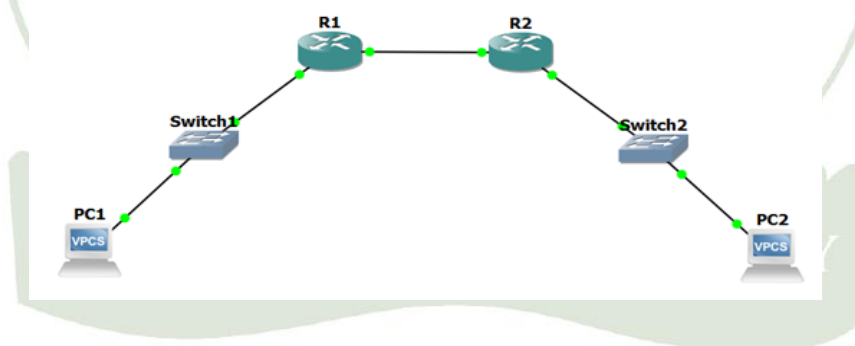
ALGORITHM:

- 1.Start
- 2.Setup the topology and initialise devices.
- 3.Configure devices and verify connectivity.
- 3.Display device information
- 4.End

DESCRIPTION AND EXECUTION:

The resources utilized are 2 PCs, 2 switches and 2 routers.

Arrange the resources in the topology format given below and begin by configuring the PC's with IP addresses followed by configuration of the routers.



Configuring PC's:

```
PC1> ip 192.168.1.1 255.255.255.0 192.168.1.3
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0 gateway 192.168.1.3
```



```
PC1 PC2
Welcome to Virtual PC Simulator, version 0.
Dedicated to Daring.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi)
All rights reserved.

VPCS is free software, distributed under the
Source code and license can be found at vpc
For more information, please visit wiki.free
Press '?' to get help.
Executing the startup file

PC2> ip 10.0.0.1 255.0.0.0 10.0.0.3
Checking for duplicate address...
PC1 : 10.0.0.1 255.0.0.0 gateway 10.0.0.3
```

Configuring Router's:

```
PC1 PC2 R1 R2
Compiled Wed 18-Aug-10 07:32 by prod_rel_team
*Mar 1 00:00:02.847: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a c
old start
*Mar 1 00:00:03.043: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state
to administratively down
*Mar 1 00:00:03.091: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state
to administratively down
*Mar 1 00:00:04.043: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to down
*Mar 1 00:00:04.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/1, changed state to down
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface fas
R1(config)#interface fastEthernet 0
R1(config)#interface fastEthernet 0/
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 192.168.1.3 255.255.255.0
R1(config-if)#exit
R1(config)#interface fastEthernet 0/1
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar 1 00:07:35.259: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:07:36.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R1(config)#interface fastEthernet 0/0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#
*Mar 1 00:07:53.671: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:07:54.671: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#exit
R1#
*Mar 1 00:07:57.579: %SYS-5-CONFIG_I: Configured from console by console
R1#
```

```
PC1 PC2 R1
R1(config)#interface fastEthernet 0/1
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar 1 00:07:35.259: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:07:36.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R1(config)#interface fastEthernet 0/0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#
*Mar 1 00:07:53.671: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:07:54.671: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#exit
R1#
*Mar 1 00:07:57.579: %SYS-5-CONFIG_I: Configured from console by console
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 192.168.1.0 255.255.255.0 192.168.2.1
%Invalid next hop address (it's this router)
R1(config)#clear
^
% Invalid input detected at '^' marker.

R1(config)#exit
R1#cl
*Mar 1 00:12:35.819: %SYS-5-CONFIG_I: Configured from console by console
R1#clear
% Type "clear ?" for a list of subcommands
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 10.0.0.0 255.0.0.0 192.168.2.2
R1(config)#exit
R1#
*Mar 1 00:13:30.259: %SYS-5-CONFIG_I: Configured from console by console
R1#
```

Checking connection:

```

PC1 PC2 R1 R2
*Mar 1 00:00:02.827: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a c
old start
*Mar 1 00:00:03.047: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state
to administratively down
*Mar 1 00:00:03.095: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state
to administratively down
*Mar 1 00:00:04.047: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/0, changed state to down
*Mar 1 00:00:04.095: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et0/1, changed state to down
R2#
R2#
R2#
R2#
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface fast
R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 10.0.0.3 255.0.0.0
R2(config-if)#no shut
R2(config-if)#exit
*Mar 1 00:08:32.163: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:08:33.163: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config-if)#exit
R2(config)#interface fastEthernet 0/1
R2(config-if)#ip address 192.168.2.2 255.0.0.0
R2(config-if)#no shut
R2(config-if)#exit
R2(config)#
*Mar 1 00:09:04.427: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:09:05.427: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R2(config)#exit
R2#
*Mar 1 00:09:09.587: %SYS-5-CONFIG_I: Configured from console by console
R2#

```

```

PC1 PC2 R1
PC1> ip 192.168.1.1 255.255.255.0 192.168.1.3
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0 gateway 192.168.1.3

PC1> ping 10.0.0.1
84 bytes from 10.0.0.1 icmp_seq=1 ttl=62 time=63.639 ms
84 bytes from 10.0.0.1 icmp_seq=2 ttl=62 time=62.670 ms
84 bytes from 10.0.0.1 icmp_seq=3 ttl=62 time=62.949 ms
84 bytes from 10.0.0.1 icmp_seq=4 ttl=62 time=61.302 ms
84 bytes from 10.0.0.1 icmp_seq=5 ttl=62 time=61.416 ms

```

RESULT: After the configuration and connection of all devices, the ping is successful from PC1 to PC2

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EXPERIMENT-10

AIM: Basic OSPF configuration using GNS3 tool.

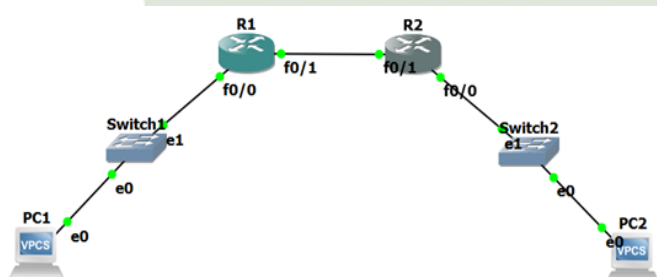
ALGORITHM:

- 1.Start
- 2.Setup the topology and initialise devices.
- 3.Configure devices and verify connectivity.
- 3.Display device information
- 4.End

DESCRIPTION AND EXECUTION:

Open Shortest Path First (OSPF) is a link-state routing protocol that is used to find the best path between the source and the destination router using its own Shortest Path First). OSPF is developed by Internet Engineering Task Force (IETF) as one of the Interior Gateway Protocol (IGP), i.e, the protocol which aims at moving the packet within a large autonomous system or routing domain. It is a network layer protocol which works on protocol number 89 and uses AD value 110. OSPF uses multicast address 224.0.0.5 for normal communication and 224.0.0.6 for update to designated router(DR)/Backup Designated Router (BDR).

The resources utilized are 4 PCs, 1 switch and 1 router. Arrange the resources in the topology format given below and begin by configuring the PC's with IP addresses followed by configuration of the switch and router.



Configuring PC's:

```
PC1> ip 192.168.10.2 255.255.255.0 192.168.10.1
Checking for duplicate address...
PC1 : 192.168.10.2 255.255.255.0 gateway 192.168.10.1

PC2> ip 192.168.30.2 255.255.255.0 192.168.30.1
Checking for duplicate address...
PC2 : 192.168.30.2 255.255.255.0 gateway 192.168.30.1
```

Configuring Router's

```
PC1 PC2 R1 R2
*Mar 1 00:00:03.591: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:03.951: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3600 Software (C3660-A3JK9S-M), Version 12.4(25d), RELEASE S
SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Wed 18-Aug-10 07:32 by prod_rel_team
*Mar 1 00:00:03.963: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a c
old start
*Mar 1 00:00:04.455: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet
et0/0, changed state to down
*Mar 1 00:00:04.459: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet
et0/1, changed state to down
*Mar 1 00:00:05.595: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state
to administratively down
*Mar 1 00:00:05.599: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state
to administratively down
R1#
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface f0/0
R1(config-if)#ip address 192.168.10.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar 1 00:07:06.711: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:07:07.711: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#interface f0/1
R1(config-if)#ip address 192.168.20.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar 1 00:07:26.499: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:07:27.499: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R1(config)#
```

```
PC1 PC2 R1
R1(config)#router ospf 1
R1(config-router)#network 192.168.10.0 0.0.0.255 area 0
R1(config-router)#network 192.168.20.0 0.0.0.255 area 0
R1(config-router)#exit
```

```
PC1 PC2 R1 R2
*Mar 1 00:00:03.419: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state t
o up
*Mar 1 00:00:03.555: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:03.915: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3600 Software (C3660-A3JK9S-M), Version 12.4(25d), RELEASE S
SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Wed 18-Aug-10 07:32 by prod_rel_team
*Mar 1 00:00:03.923: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a c
old start
*Mar 1 00:00:04.415: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet
et0/0, changed state to down
*Mar 1 00:00:04.419: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet
et0/1, changed state to down
*Mar 1 00:00:05.559: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state
to administratively down
*Mar 1 00:00:05.563: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state
to administratively down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface f0/0
R2(config-if)#ip address 192.168.30.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Mar 1 00:07:30.127: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:07:31.127: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state
R2(config)#interface f0/1
R2(config-if)#ip address 192.168.20.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Mar 1 00:07:53.079: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:07:54.079: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
R2(config)#
```

```
PC1 PC2 R1 R2
R2(config-if)#exit
R2(config)#
*Mar 1 00:07:30.127: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:07:31.127: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config)#interface f0/1
R2(config-if)#ip address 192.168.20.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Mar 1 00:07:53.079: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:07:54.079: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R2(config)#router ospf 1
R2(config-router)#network 192.168.20.0 0.0.0.255 area 0
R2(config-router)#network 192.168
*Mar 1 00:30:12.335: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.20.1 on FastEthernet0/1 from LOADING to FULL, Loading Done
R2(config-router)#network 192.168.30.0 0.0.0.255 area 0
R2(config-router)#end
R2#
*Mar 1 00:30:48.555: %SYS-5-CONFIG_I: Configured from console by console
R2#
```

Checking connection:

```
PC1 PC2 R1
Press '?' to get help.
Executing the startup file

PC2> ip 192.168.30.2 255.255.255.0 192.168.30.1
Checking for duplicate address...
PC1 : 192.168.30.2 255.255.255.0 gateway 192.168.30.1

PC2> ping 192.168.10.2
Bad command: "ping 192.168.10.2". Use ? for help.

PC2> ping 192.168.10.2
84 bytes from 192.168.10.2 icmp_seq=1 ttl=62 time=36.087 ms
84 bytes from 192.168.10.2 icmp_seq=2 ttl=62 time=44.473 ms
84 bytes from 192.168.10.2 icmp_seq=3 ttl=62 time=38.276 ms
84 bytes from 192.168.10.2 icmp_seq=4 ttl=62 time=36.353 ms
84 bytes from 192.168.10.2 icmp_seq=5 ttl=62 time=36.766 ms
```

RESULT: After the configuration and connection of all devices, the ping is successful from PC1 to PC2

EXPERIMENT-11

AIM: Basic EIGRP Configuration using GNS3 tool.

ALGORITHM:

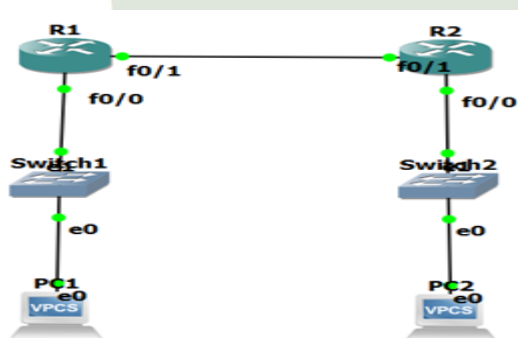
- 1.Start
- 2.Setup the topology and initialise devices.
- 3.Configure devices and verify connectivity.
- 3.Display device information
- 4.End

DESCRIPTION AND EXECUTION:

Enhanced Interior Gateway Routing Protocol (EIGRP) is a dynamic routing protocol that is used to find the best path between any two-layer 3 devices to deliver the packet. EIGRP works on network layer Protocol of OSI model and uses protocol number 88. It uses metrics to find out the best path between two layer 3 devices (router or layer 3 switches) operating EIGRP.

The resources utilized are 2 PCs, 2 switches and 2 routers.

Arrange the resources in the topology format given below and begin by configuring the PC's with IP addresses followed by configuration of the switch and router.



Configuring PC's:

```
PC1 Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn

Press '?' to get help.

Executing the startup file

PC1> ip 192.168.10.2 255.255.255.0 192.168.10.1
Checking for duplicate address...
PC1 : 192.168.10.2 255.255.255.0 gateway 192.168.10.1

PC2 Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
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Press '?' to get help.

Executing the startup file

PC2> ip 192.168.30.2 255.255.255.0 192.168.30.1
Checking for duplicate address...
PC1 : 192.168.30.2 255.255.255.0 gateway 192.168.30.1
```

Configuring Routers:

```
PC1 PC2 R1 R2
*Mar 1 00:00:04.163: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:04.743: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3600 Software (C3660-A3JK9S-M), Version 12.4(25d), RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Wed 18-Aug-10 07:32 by prod_rel_team
*Mar 1 00:00:04.755: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a cold start
*Mar 1 00:00:04.839: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
*Mar 1 00:00:04.843: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:06.163: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Mar 1 00:00:06.171: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface f0/0
R1(config-if)#ip address 192.168.10.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar 1 00:03:46.199: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:03:47.199: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#interface f0/1
R1(config-if)#ip address 192.168.20.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar 1 00:04:04.855: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:04:05.855: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R1(config)#router eigrp 1
R1(config-router)#network 192.168.10.0 0.0.0.255
R1(config-router)#network 192.168.20.0 0.0.0.255
R1(config-router)#end
R1#
*Mar 1 00:06:59.175: %SYS-5-CONFIG_I: Configured from console by console
R1#
*Mar 1 00:07:34.771: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 192.168.20.2 (FastEthernet0/1) is up: new adjacency
R1#
```

```
PC1 PC2 R1 R2
*Mar 1 00:00:04.143: %SYS-5-CONFIG_I: Configured from memory by console
*Mar 1 00:00:04.707: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 3600 Software (C3660-A3JK9S-M), Version 12.4(25d), RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2010 by Cisco Systems, Inc.
Compiled Wed 18-Aug-10 07:32 by prod_rel_team
*Mar 1 00:00:04.723: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a cold start
*Mar 1 00:00:04.831: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
*Mar 1 00:00:04.835: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
*Mar 1 00:00:06.143: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Mar 1 00:00:06.151: %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface f0/0
R2(config-if)#ip address 192.168.30.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Mar 1 00:04:06.731: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:04:07.731: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config)#interface f0/1
R2(config-if)#ip address 192.168.20.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Mar 1 00:04:27.519: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
*Mar 1 00:04:28.519: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
R2(config)#router eigrp 1
R2(config-router)#network 192.168.20.0 0.0.0.255
R2(config-router)#network 192.168.30.0 0.0.0.255
*Mar 1 00:06:57.043: %DUAL-5-NBRCHANGE: IP-EIGRP(0) 1: Neighbor 192.168.20.1 (FastEthernet0/1) is up: new adjacency
R2(config-router)#network 192.168.30.0 0.0.0.255
R2(config-router)#end
R2#
*Mar 1 00:07:11.919: %SYS-5-CONFIG_I: Configured from console by console
R2#
```


Checking connection:

```
PC1 PC2 R1
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
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For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.30.2 255.255.255.0 192.168.30.1
Checking for duplicate address...
PC1 : 192.168.30.2 255.255.255.0 gateway 192.168.30.1

PC2> ping 192.168.10.2
84 bytes from 192.168.10.2 icmp_seq=1 ttl=62 time=34.498 ms
84 bytes from 192.168.10.2 icmp_seq=2 ttl=62 time=34.363 ms
84 bytes from 192.168.10.2 icmp_seq=3 ttl=62 time=42.615 ms
84 bytes from 192.168.10.2 icmp_seq=4 ttl=62 time=38.389 ms
84 bytes from 192.168.10.2 icmp_seq=5 ttl=62 time=36.330 ms
```

```
PC1 PC2 R1
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
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For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC1> ip 192.168.10.2 255.255.255.0 192.168.10.1
Checking for duplicate address...
PC1 : 192.168.10.2 255.255.255.0 gateway 192.168.10.1

PC1> ping 192.168.30.2
192.168.30.2 icmp_seq=1 timeout
84 bytes from 192.168.30.2 icmp_seq=2 ttl=62 time=42.363 ms
84 bytes from 192.168.30.2 icmp_seq=3 ttl=62 time=36.680 ms
84 bytes from 192.168.30.2 icmp_seq=4 ttl=62 time=35.786 ms
84 bytes from 192.168.30.2 icmp_seq=5 ttl=62 time=45.241 ms
```

RESULT: After the configuration and connection of all devices, the ping is successful between PCs

EXPERIMENT-12

AIM: Illustrate TCPDUMP command

DESCRIPTION:

tcpdump is a packet sniffing and packet analyzing tool for a System Administrator to troubleshoot connectivity issues in Linux. It is used to capture, filter, and analyze network traffic such as TCP/IP packets going through your system. It is many times used as a security tool as well. It saves the captured information in a pcap file, these pcap files can then be opened through Wireshark or through the command tool itself.

COMMANDS:

Installing tcpdump tool in Linux

For RedHat based linux OS

For Ubuntu/Debian OS

```
apt install tcpdump
```

Working with tcpdump command:

1. To capture the packets of current network interface
`sudo tcpdump`

This will capture the packets from the current interface of the network through which the system is connected to the internet.

OUTPUT:

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo tcpdump
[sudo] password for onworks:
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
05:48:14.000181 IP6 onworks-Standard-PC-i440FX-PIIX-1996.39452 > 2001::67c:1560:8003::c7.ntp: NTPv4, Client, length 48
05:48:14.003418 IP onworks-Standard-PC-i440FX-PIIX-1996.40401 > 10.0.2.3.domain: 17769+ [1au] PTR? 7.c..0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.3.0.0.8.0.6.5.1.c.7.6.0.1.0.0.2.ip6.arpa. (101)
05:48:14.024113 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.40401: 17769 NXDomain 0/1/1 (165)
05:48:14.024254 IP onworks-Standard-PC-i440FX-PIIX-1996.40401 > 10.0.2.3.domain: 17769+ PTR? 7.c..0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.3.0.0.8.0.6.5.1.c.7.6.0.1.0.0.2.ip6.arpa. (90)
05:48:14.043893 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.40401: 17769 NXDomain 0/1/0 (154)
05:48:14.044492 IP onworks-Standard-PC-i440FX-PIIX-1996.38770 > 10.0.2.3.domain: 48851+ [1au] PTR? f.9.f.e.7.b.8.3.0.e.5.9.c.b.0.f.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.c.e.f.ip6.arpa. (101)
05:48:14.050374 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.38770: 48851 NXDomain 0/1/1 (165)
05:48:14.050442 IP onworks-Standard-PC-i440FX-PIIX-1996.38770 > 10.0.2.3.domain: 48851+ PTR? f.9.f.e.7.b.8.3.0.e.5.9.c.b.0.f.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.c.e.f.ip6.arpa. (90)
05:48:14.056105 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.38770: 48851 NXDomain 0/1/0 (154)
05:48:14.057724 IP onworks-Standard-PC-i440FX-PIIX-1996.51120 > 10.0.2.3.domain: 44979+ [1au] PTR? 3.2.0.10.in-addr.arpa. (50)
05:48:14.062638 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.51120: 44979 NXDomain 0/0/1 (50)
05:48:14.062690 IP onworks-Standard-PC-i440FX-PIIX-1996.51120 > 10.0.2.3.domain: 44979+ PTR? 3.2.0.10.in-addr.arpa. (39)
05:48:14.067810 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.51120: 44979 NXDomain 0/0/0 (39)
05:48:14.068863 IP onworks-Standard-PC-i440FX-PIIX-1996.44277 > 10.0.2.3.domain: 27335+ [1au] PTR? 15.2.0.10.in-addr.arpa. (51)
05:48:14.074037 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.44277: 27335 NXDomain 0/0/1 (51)
05:48:14.074090 IP onworks-Standard-PC-i440FX-PIIX-1996.44277 > 10.0.2.3.domain: 27335+ PTR? 15.2.0.10.in-addr.arpa. (40)
05:48:14.079237 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.44277: 27335 NXDomain 0/0/0 (40)
05:48:19.255857 ARP. Request who-has 10.0.2.3 tell onworks-Standard-PC-i440FX-PIIX-1996. length 28
```


2. To capture packets from a specific network interface

`sudo tcpdump -i wlo1`

This command will now capture the packets from wlo1 network interface.

Output:

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo tcpdump -i ens3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
05:52:28.931050 IP api.snapcraft.io.https > onworks-Standard-PC-i440FX-PIIX-1996.50582: Flags [F.], seq
0, ack 546792116, win 8760, length 0
05:52:28.931051 IP api.snapcraft.io.https > onworks-Standard-PC-i440FX-PIIX-1996.60882: Flags [F.], seq
0, ack 108906055, win 8760, length 0
05:52:28.931848 IP onworks-Standard-PC-i440FX-PIIX-1996.52595 > 10.0.2.3.domain: 39045+ [1au] PTR? 15.2.
0.10.in-addr.arpa. (51)
05:52:28.937091 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.52595: 39045 NXDomain 0/0/1 (5
1)
05:52:28.937253 IP onworks-Standard-PC-i440FX-PIIX-1996.52595 > 10.0.2.3.domain: 39045+ PTR? 15.2.0.10.i
n-addr.arpa. (40)
05:52:28.942497 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.52595: 39045 NXDomain 0/0/0 (4
0)
05:52:28.943034 IP onworks-Standard-PC-i440FX-PIIX-1996.59248 > 10.0.2.3.domain: 13188+ [1au] PTR? 40.92
.189.91.in-addr.arpa. (54)
05:52:28.963868 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.59248: 13188 1/0/1 PTR api.sna
pcraft.io. (84)
05:52:28.964545 IP onworks-Standard-PC-i440FX-PIIX-1996.36643 > 10.0.2.3.domain: 32716+ [1au] PTR? 3.2.0
.10.in-addr.arpa. (50)
05:52:28.969811 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.36643: 32716 NXDomain 0/0/1 (5
0)
05:52:28.969931 IP onworks-Standard-PC-i440FX-PIIX-1996.36643 > 10.0.2.3.domain: 32716+ PTR? 3.2.0.10.in
-addr.arpa. (39)
05:52:28.975127 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.36643: 32716 NXDomain 0/0/0 (3
9)
05:52:29.338869 IP onworks-Standard-PC-i440FX-PIIX-1996.50588 > api.snapcraft.io.https: Flags [S], seq 6
32749650, win 64240, options [mss 1460,sackOK,TS val 527748808 ecr 0,nop,wscale 7], length 0
05:52:30.439288 IP api.snapcraft.io.https > onworks-Standard-PC-i440FX-PIIX-1996.60880: Flags [F.], seq
0, ack 1150855087, win 8760, length 0
```

3. To capture specific number of packets

`sudo tcpdump -c 4 -i wlo1`

This command will capture only 4 packets from the wlo1 interface.

OUTPUT

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo tcpdump -c 4 -i ens3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
05:53:58.218801 IP api.snapcraft.io.https > onworks-Standard-PC-i440FX-PIIX-1996.50590: Flags [F.], seq
0, ack 2605884239, win 8760, length 0
05:53:58.219421 IP onworks-Standard-PC-i440FX-PIIX-1996.59279 > 10.0.2.3.domain: 6954+ [1au] PTR? 15.2.0
.10.in-addr.arpa. (51)
05:53:58.224558 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.59279: 6954 NXDomain 0/0/1 (51
)
05:53:58.224629 IP onworks-Standard-PC-i440FX-PIIX-1996.59279 > 10.0.2.3.domain: 6954+ PTR? 15.2.0.10.in
-addr.arpa. (40)
4 packets captured
9 packets received by filter
0 packets dropped by kernel
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```


6. To display packets in HEX and ASCII values

`sudo tcpdump -XX -i wlo1`

This command will now print the packets captured from the wlo1 interface in the HEX and ASCII values.

OUTPUT:

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo tcpdump -XX -i ens3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
06:06:08.998046 IP onworks-Standard-PC-i440FX-PIIX-1996.60890 > api.snapcraft.io.https: Flags [S], seq 5
18894480, win 64240, options [mss 1460,sackOK,TS val 924234676 ecr 0,nop,wscale 7], length 0
 0x0000: 5255 0a00 0202 5254 0012 3456 0800 4500  RU....RT..4V..E.
 0x0010: 003c dba1 4000 4006 9b3b 0a00 020f 5bbd  .<..@.@.;...[.
 0x0020: 5c13 edda 01bb 1eed b390 0000 0000 a002  \.....f.....
 0x0030: faf0 c40d 0000 0204 05b4 0402 080a 3716  .....7.
 0x0040: b3b4 0000 0000 0103 0307  .....
06:06:08.998122 IP onworks-Standard-PC-i440FX-PIIX-1996.60888 > api.snapcraft.io.https: Flags [S], seq 2
244248178, win 64240, options [mss 1460,sackOK,TS val 924234676 ecr 0,nop,wscale 7], length 0
 0x0000: 5255 0a00 0202 5254 0012 3456 0800 4500  RU....RT..4V..E.
 0x0010: 003c 8f47 4000 4006 e795 0a00 020f 5bbd  .<..@.@.....[.
 0x0020: 5c13 edd8 01bb 85c4 8272 0000 0000 a002  \.....f.....
 0x0030: faf0 c40d 0000 0204 05b4 0402 080a 3716  .....7.
 0x0040: b3b4 0000 0000 0103 0307  .....
06:06:08.998784 IP onworks-Standard-PC-i440FX-PIIX-1996.56572 > 10.0.2.3.domain: 17108+ [1au] PTR? 19.92
.189.91.in-addr.arpa. (54)
 0x0000: 5255 0a00 0203 5254 0012 3456 0800 4500  RU....RT..4V..E.
 0x0010: 0052 827d 4000 4011 a00c 0a00 020f 0a00  .R.)@.@.....
 0x0020: 0203 dcf0 0035 003e 1861 42d4 0100 0001  ....5>.aB.....
 0x0030: 0000 0000 0001 0231 3902 3932 0331 3839  .....19.92.189
 0x0040: 0239 3107 696e 2d61 6464 7204 6172 7061  .91.in-addr.arpa
 0x0050: 0000 0c00 0100 0029 0200 0000 0000 0000  .....).
06:06:09.329377 IP 10.0.2.3.domain > onworks-Standard-PC-i440FX-PIIX-1996.56572: 17108 1/0/1 PTR api.sna
pcraft.io. (84)
 0x0000: 5254 0012 3456 5255 0a00 0202 0800 4500  RT..4VRU.....E.
 0x0010: 0070 57e2 0000 4011 0a8a 0a00 0203 0a00  .pW...@.....
 0x0020: 020f 0035 dcf0 005c 96e1 42d4 8180 0001  ...5...\B.....
 0x0030: 0001 0000 0001 0231 3902 3932 0331 3839  .....19.92.189
 0x0040: 0239 3107 696e 2d61 6464 7204 6172 7061  .91.in-addr.arpa
 0x0050: 0000 0c00 01c0 0c00 0c00 0100 000e 1000  .....

```

7. To save captured packets into a file

`sudo tcpdump -w captured_packets.pcap -i wlo1`

This command will now output all the captures packets in a file named as captured_packets.pcap.

OUTPUT

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo tcpdump -w captured_packets.pcap -i ens3
[sudo] password for onworks:
tcpdump: listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
^C6945 packets captured
6945 packets received by filter
0 packets dropped by kernel
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$

```


8. To read captured packets from a file
`sudo tcpdump -r captured_packets.pcap`

This command will now read the captured packets from the captured_packets.pcap file.

OUTPUT

```
06:09:49.639495 IP onworks-Standard-PC-i440FX-PIIX-1996.43466 > ubuntu-mirror-1.ps6.canonical.com.http:
Flags [.], ack 366723, win 65535, length 0
^C06:09:49.639491 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466
: Flags [P.], seq 366723:368183, ack 487, win 8760, length 1460: HTTP

onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo tcpdump -r captured_packets.pcap

06:09:50.673298 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [P.], seq 8782587:8784047, ack 6995, win 8760, length 1460: HTTP: HTTP/1.1 200 OK
06:09:50.673314 IP onworks-Standard-PC-i440FX-PIIX-1996.43466 > ubuntu-mirror-1.ps6.canonical.com.http:
Flags [.], ack 8784047, win 65535, length 0
06:09:50.673298 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [P.], seq 8784047:8784659, ack 6995, win 8760, length 612: HTTP
06:09:50.677271 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [P.], seq 8784659:8786119, ack 6995, win 8760, length 1460: HTTP: HTTP/1.1 200 OK
06:09:50.677277 IP onworks-Standard-PC-i440FX-PIIX-1996.43466 > ubuntu-mirror-1.ps6.canonical.com.http:
Flags [.], ack 8786119, win 65535, length 0
06:09:50.677271 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [P.], seq 8786119:8787361, ack 6995, win 8760, length 1242: HTTP
06:09:50.689237 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [P.], seq 8787361:8787592, ack 6995, win 8760, length 231: HTTP: HTTP/1.1 200 OK
06:09:50.689246 IP onworks-Standard-PC-i440FX-PIIX-1996.43466 > ubuntu-mirror-1.ps6.canonical.com.http:
Flags [.], ack 8787592, win 65535, length 0
06:09:50.689360 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [P.], seq 8787592:8788344, ack 6995, win 8760, length 752: HTTP: HTTP/1.1 200 OK
06:09:50.733069 IP onworks-Standard-PC-i440FX-PIIX-1996.43466 > ubuntu-mirror-1.ps6.canonical.com.http:
Flags [.], ack 8788344, win 65535, length 0
06:09:51.971131 IP onworks-Standard-PC-i440FX-PIIX-1996.43466 > ubuntu-mirror-1.ps6.canonical.com.http:
Flags [F.], seq 6995, ack 8788344, win 65535, length 0
06:09:51.971237 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [.], ack 6996, win 8760, length 0
06:09:51.971622 IP onworks-Standard-PC-i440FX-PIIX-1996.55472 > 141.30.62.22.http: Flags [F.], seq 11122
, ack 11759863, win 65535, length 0
06:09:51.971678 IP 141.30.62.22.http > onworks-Standard-PC-i440FX-PIIX-1996.55472: Flags [.], ack 11123,
win 8760, length 0
06:09:51.990490 IP 141.30.62.22.http > onworks-Standard-PC-i440FX-PIIX-1996.55472: Flags [R.], seq 11759
863, ack 11123, win 8760, length 0
06:09:52.120914 IP ubuntu-mirror-1.ps6.canonical.com.http > onworks-Standard-PC-i440FX-PIIX-1996.43466:
Flags [R.], seq 8788344, ack 6996, win 8760, length 0
06:09:52.769093 IP6 onworks-Standard-PC-i440FX-PIIX-1996 > fec0::2: ICMP6, neighbor solicitation, who ha
s fec0::2, length 32
06:09:52.769195 IP6 fec0::2 > onworks-Standard-PC-i440FX-PIIX-1996: ICMP6, neighbor advertisement, tgt i
s fec0::2, length 32
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ^C
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

9. To capture packets with ip address

sudo tcpdump -n -i wlo1

This command will now capture the packets with IP addresses.

OUTPUT

```
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~$ sudo tcpdump -n -i ens3
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
06:13:49.830711 IP 10.0.2.15.50648 > 91.189.92.40.443: Flags [S], seq 2473722447, win 64240, options [ns
s 1460,sackOK,TS val 527781608 ecr 0,nop,wscale 7], length 0
06:13:49.830770 IP 10.0.2.15.50646 > 91.189.92.40.443: Flags [S], seq 4139998373, win 64240, options [ns
s 1460,sackOK,TS val 527781608 ecr 0,nop,wscale 7], length 0
06:13:50.730668 IP 91.189.92.40.443 > 10.0.2.15.50646: Flags [F.], seq 0, ack 4139998374, win 8192, leng
th 0
06:13:50.730668 IP 91.189.92.40.443 > 10.0.2.15.50638: Flags [F.], seq 0, ack 478652487, win 8760, lengt
h 0
06:13:50.730668 IP 91.189.92.40.443 > 10.0.2.15.50630: Flags [F.], seq 0, ack 3530249906, win 8760, leng
th 0
06:13:50.730668 IP 91.189.92.40.443 > 10.0.2.15.50628: Flags [F.], seq 0, ack 3627054957, win 8760, leng
th 0
06:13:51.944216 IP 91.189.92.40.443 > 10.0.2.15.50626: Flags [F.], seq 0, ack 816105158, win 8760, lengt
h 0
06:13:51.944216 IP 91.189.92.40.443 > 10.0.2.15.50624: Flags [F.], seq 0, ack 3202938958, win 8760, leng
th 0
^C
8 packets captured
8 packets received by filter
0 packets dropped by kernel
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~$
```

10. To capture only TCP packets

sudo tcpdump -i wlo1 tcp

This command will now capture only TCP packets from wlo1.

OUTPUT:

```
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~$ sudo tcpdump -i ens3 tcp
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on ens3, link-type EN10MB (Ethernet), capture size 262144 bytes
06:14:24.384720 IP onworks-Standard-PC-l440FX-PIIX-1996.50650 > api.snapcraft.io.https: Flags [S], seq 1
615645445, win 64240, options [mss 1460,sackOK,TS val 527816168 ecr 0,nop,wscale 7], length 0
06:14:24.500819 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50636: Flags [F.], seq
0, ack 2567671397, win 8760, length 0
06:14:24.500820 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50634: Flags [F.], seq
0, ack 3404788314, win 8760, length 0
06:14:24.871697 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50640: Flags [F.], seq
0, ack 3663748440, win 8760, length 0
06:14:25.880965 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50650: Flags [F.], seq
0, ack 1615645446, win 8760, length 0
06:14:26.379730 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50638: Flags [F.], seq
0, ack 478652487, win 8760, length 0
06:14:26.379730 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50630: Flags [F.], seq
0, ack 3530249906, win 8760, length 0
06:14:26.379730 IP api.snapcraft.io.https > onworks-Standard-PC-l440FX-PIIX-1996.50628: Flags [F.], seq
0, ack 3627054957, win 8760, length 0
^C
8 packets captured
8 packets received by filter
0 packets dropped by kernel
onworks@onworks-Standard-PC-l440FX-PIIX-1996:~$
```

CONCLUSION: The tcpdump command is studied and analysed