KARPAGAM ACADEMY OF HIGHER EDUCATION
(Deemed to be University)
(Established Under Section 3 of UGC Act, 1956)
Coimbatore-641021.
(For the candidates admitted from 2017 onwards)

DEPARTMENT OF CS,CA & IT

Semester-II

17CSP211 ROUTER CONFIGURATION – PRACTICAL 4H – 2C

Instruction Hours / week: L: 0 T: 0 P: 4 Marks: Int : **40** Ext : **60** Total: **100**

SCOPE

This course enables to learn the principles of networking, build own network topology, and can practice different scenarios.

OBJECTIVES

- Understand the behavior of a network in real-time mode and simulation mode.
- Gain practical networking technology skills in a rapidly changing environment.
- Perform basic configuration on routers and Ethernet switches.
- Design a small or medium sized computer network including media types, end devices and interconnecting devices.

LIST OF PROGRAMS

1. Simple router configuration.
2. Access and utilize the router to set basic parameters.
3. Connect configure and verify operation status of a device interface.
4. Implement static and dynamic addressing services for hosts in a LAN Environment.
5. Identify and correct common problems associated with IP addressing and host configurations.
6. Configure verify and troubleshoot RIPv2.
7. Perform and verify routing configuration tasks for a static or default route given.

8. Configure verify and troubleshoot NAT operation on a router.
9. Configure and verify a PPP connection between routers.

EX.NO :1 ROUTER CONFIGURATION

DATE : 05-12-2017

AIM:

To create a simple router configuration in cisco packet tracer.

ALGORITHM:

Step 1: Start the configuration.

Step 2: Click Start-> All programs->cisco packet tracer.

Step 3: Create topology with router 1841.

Step 4: CLT will normally appear in user mode (router).

Step 5: From the user mode to move to privileged mode enter "enable" command privilege.

Step 6: Mode to global configuration mode to use "configuration terminal" command.

Step 7: Use the command interface fastethernet0/0 to access Ethernet0/0.

Step 8: Use IP address command to assign an IP address and subnet mark to the interface.

Step9: Fastethernet0/1 is same as fastethernet0/0

Step10: Show IP interface command.

Step11: Use the exit command foe exiting all process.

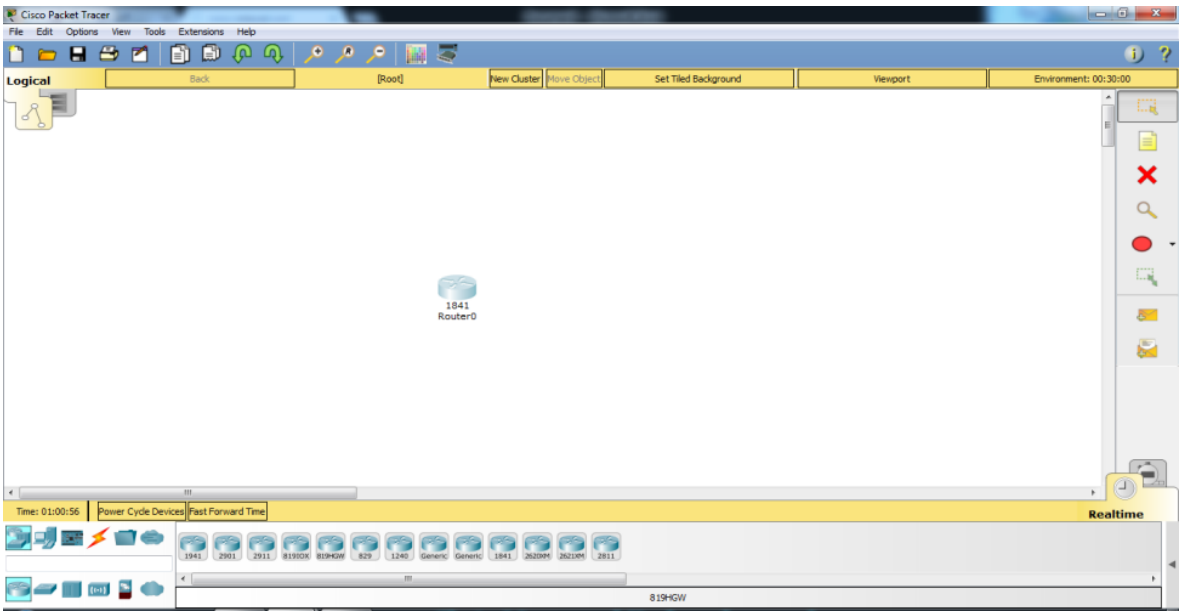
Step12: Stop the configuration.

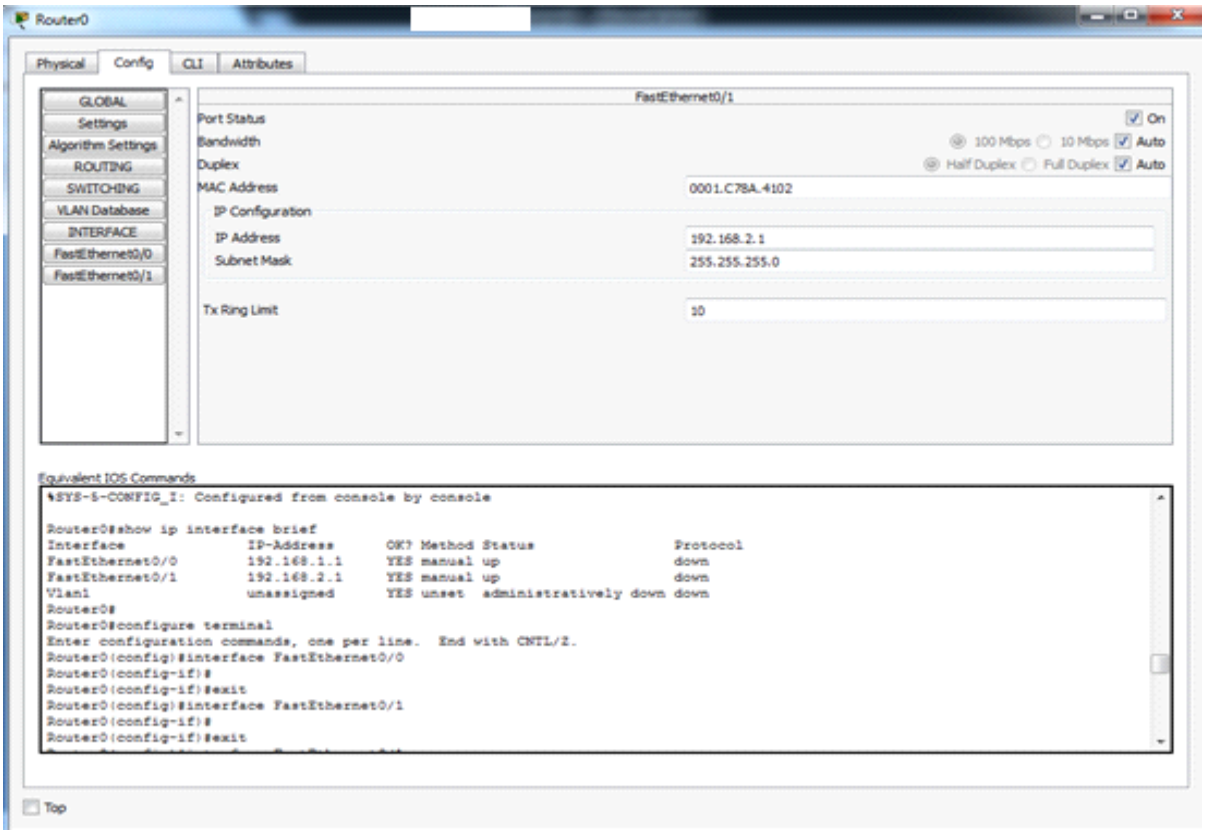
CODING:

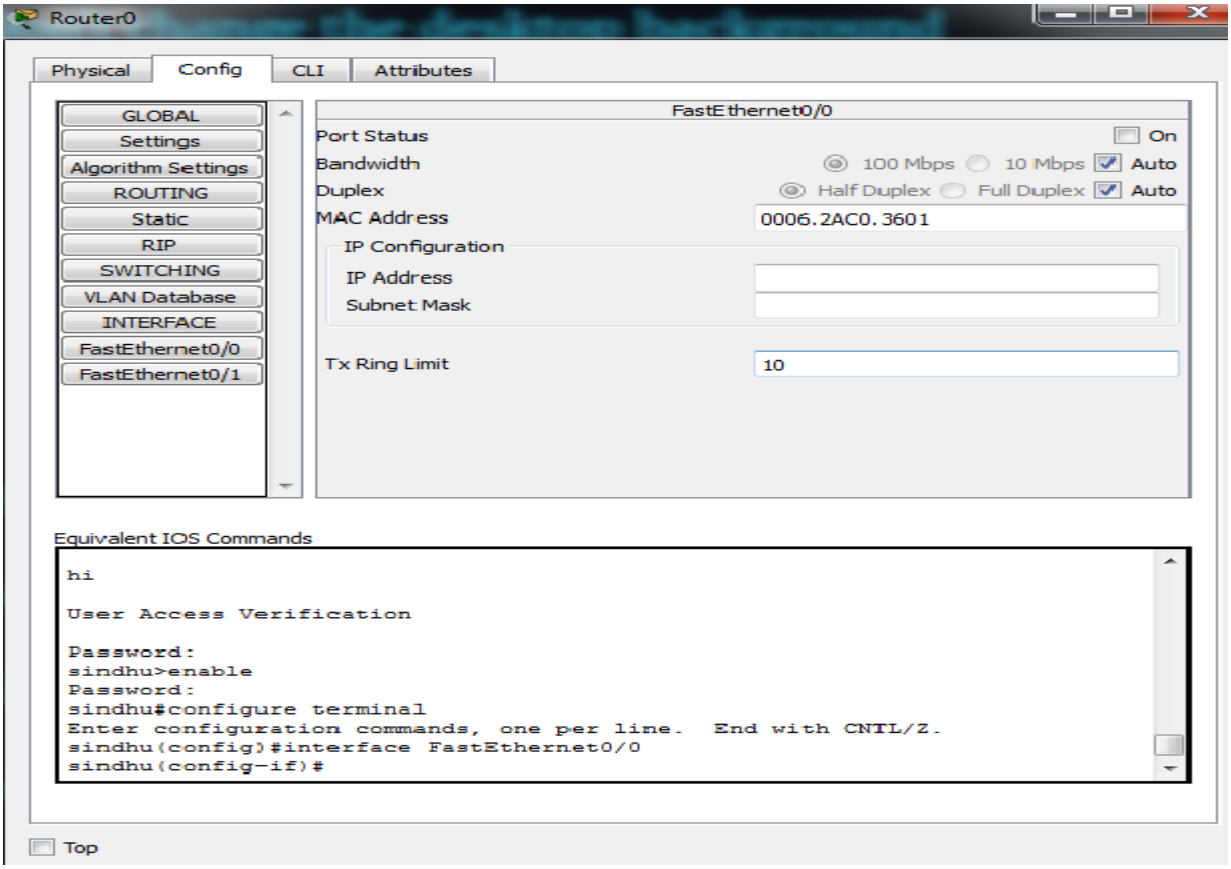
```
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Router0
Router0(config)#enable secret class
Router0(config)#line console 0
Router0(config-line)#password msc3
Router0(config-line)#login
Router0(config-line)#exit
Router0(config)#line vty 0 4
Router0(config-line)#password msc3
Router0(config-line)#login
Router0(config-line)#exit
Router0(config)#interface Fastethernet0/0
Router0(config-if)#ip address 192.168.1.1 255.255.255.0
Router0(config-if)#no shutdown
Router0(config-if)#exit
Router0(config)#interface FastEthernet0/1
Router0(config-if)#ip address 192.168.2.1 255.255.255.0
Router0(config-if)#no shutdown
Router0(config-if)#exit
Router0(config)#exit

Router0#show ip interface brief
Interface IP-Address OK? Method Status Protocol
FastEthernet0/0 192.168.1.1 YES manual up down
FastEthernet0/1 192.168.2.1 YES manual up down
Vlan1 unassigned YES unset administratively down down
Router0#

Router0#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router0(config)#interface FastEthernet0/0
Router0(config-if)#
Router0(config-if)#exit
Router0(config)#interface FastEthernet0/1
Router0(config-if)#
Router0(config-if)#exit
```

Router0(config)#interface FastEthernet0/1
Router0(config-if)#

OUTPUT:







RESULT:

The router configuration has successfully implemented.

EX.NO:2 ACCESSING THE PARAMETER OF THE ROUTER

DATE : 14-12-2017

AIM:

To access and utilize the router to set basic parameter.

ALGORITHM:

Step1: Start the configuration.

Step2: Click start-> All programs->cisco packet tracer.

Step3: Create topology with router 1841.

Step4: CLT will normally appear in user mode (router).

Step5: From the user mode to move to privileged mode enter "enable" command privilege.

Step6: Mode to global configuration mode to use "configuration terminal" command.

Step7: Use the command clock set to set the clock.

Step8: To protect the user mode create the enable password.

Step9: Use the command line console 0 to display the text line by line.

Step10: Use the command history size to view no. of bytes.

Step11: To display minutes and seconds use exec timeout command.

Step12: Use the command show running config for display current configuration size, timestamps and password.

Step13: Stop the configuration.

CODING:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname sindhu
sindhu(config)#exit
sindhu#
%SYS-5-CONFIG_I: Configured from console by console

sindhu#clock set ?
hh:mm:ss Current Time
sindhu#clock set 02:20:40 jan 2 2018
sindhu#conf t
Enter configuration commands, one per line. End with CNTL/Z..

sindhu(config)#enable password msc3
sindhu(config)#line console 0
sindhu(config-line)#login
% Login disabled on line 0, until 'password' is set
sindhu(config-line)#password mcs3
sindhu(config-line)#exit
sindhu(config)#exit
sindhu#
%SYS-5-CONFIG_I: Configured from console by console

sindhu#en
sindhu#conf t
Enter configuration commands, one per line. End with CNTL/Z.
sindhu(config)#exit
sindhu#
%SYS-5-CONFIG_I: Configured from console by console
```

Show run:

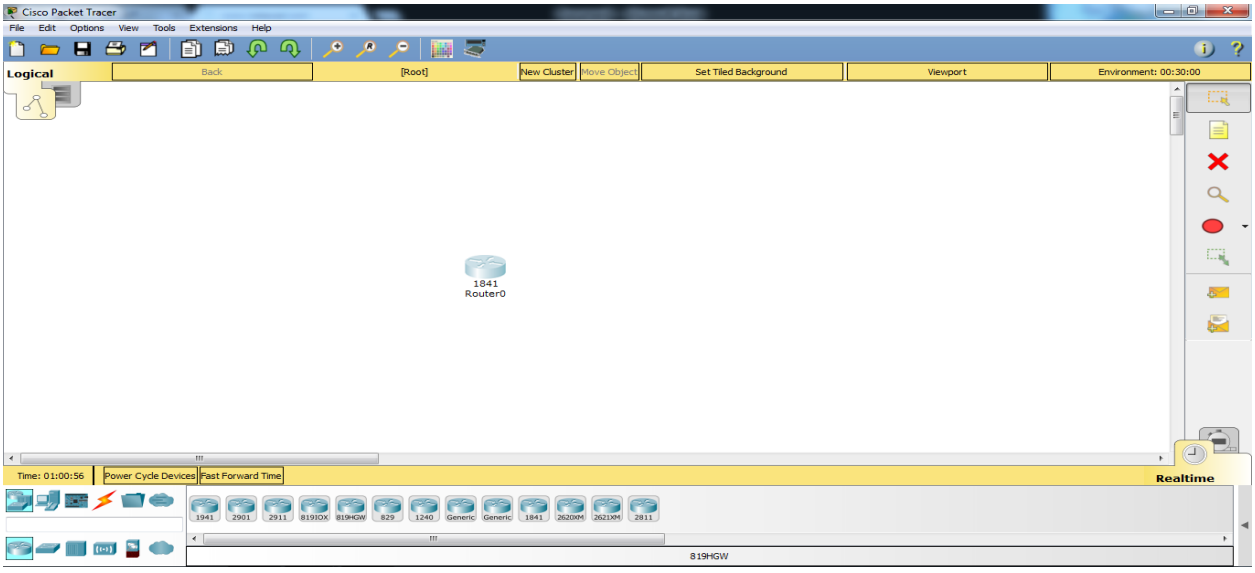
```
sindhu#show run
Building configuration...
Current configuration : 596 bytes
!
version 12.4
no service timestamps log datetimemsec
```

```
no service timestamps debug datetimemsec
no service password-encryption
!
hostname sindhu
!
!
!
enable password msc3
!
!
!
!
!
!
ipcef
no ipv6 cef
!
!
!
!
sindhu#conf t
Enter configuration commands, one per line. End with CNTL/Z.
sindhu(config)#line console 0

sindhu(config-line)#history size 10

sindhu(config-line)#exec-timeout ?
<0-35791> Timeout in minutes
sindhu(config-line)#exec-timeout 15 45
sindhu(config)#exit
sindhu#
%SYS-5-CONFIG_I: Configured from console by console
sindhu#show running-config
Building configuration...
Current configuration : 635 bytes
!
version 12.4
no service timestamps log datetimemsec
no service timestamps debug datetimemsec
no service password-encryption
!
hostname sindhu
!
```

!
!
enable password msc3
!
!
!
!
!
!
ipcef
no ipv6 cef
!
!
!

-more-

OUTPUT:



RESULT:

The router has been successfully implemented and the basic parameters are utilized.

EX.NO:3 CONFIGURE THE OPERATION STATUS OF A DEVICE INTERFACE

DATE : 19-12-2017

AIM:

To connect configure and verify operation status of a device interface.

ALGORITHM:

Step1: Start the configuration.

Step2: Click start-> All programs-> cisco packet tracer.

Step3: Create topology with router 1841,PC-PTPC0, PC-PTPC1.

Step4: CLT will normally appear in user mode (router).

Step5: Use the command enable" and "conf t" to privileged mode and configuration mode.

Step6: Use the command interface fastethernet0/0 and 0/1 to assign an IP address and subnet mask to connect the device interface.

Step7: Click PC-PTPC0 -> desktop-> IP configuration assign IP address and default gateway.

Step8: Click add simple PDU(P) to send the packet from one system to another through router.

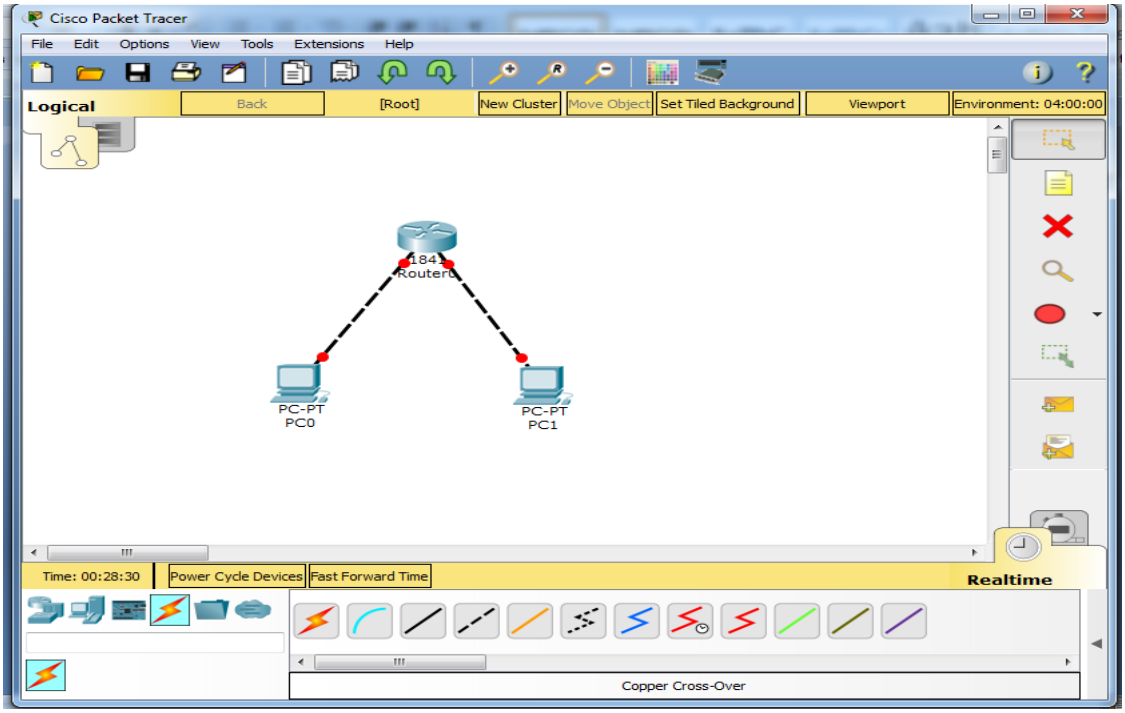
Step9: Click PDU list window to check the status about the packets.

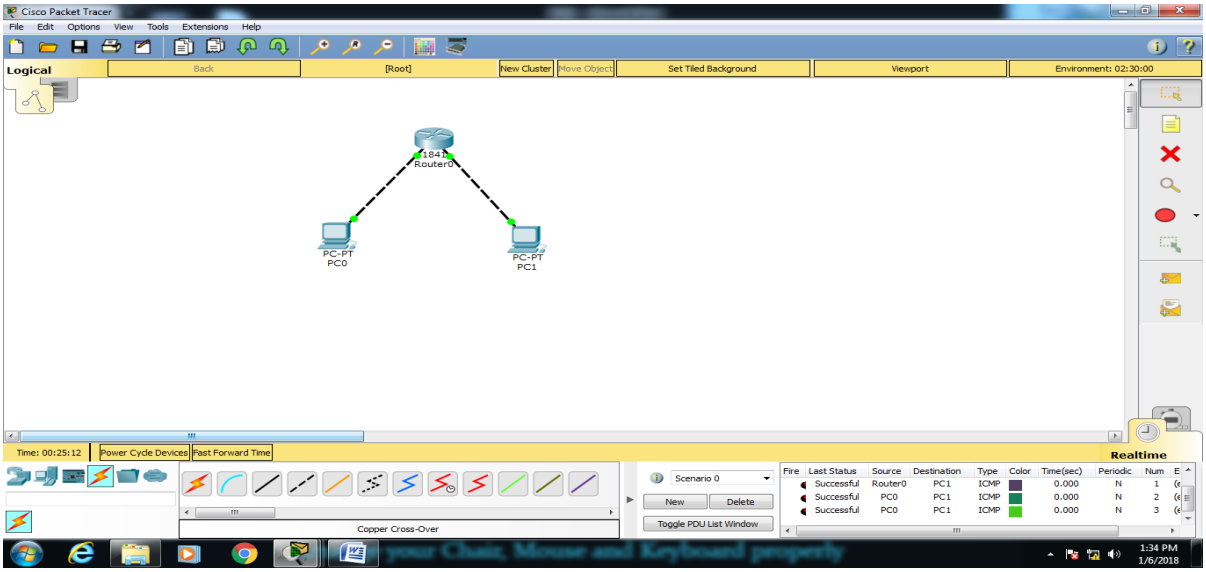
Step10: Stop the configuration.

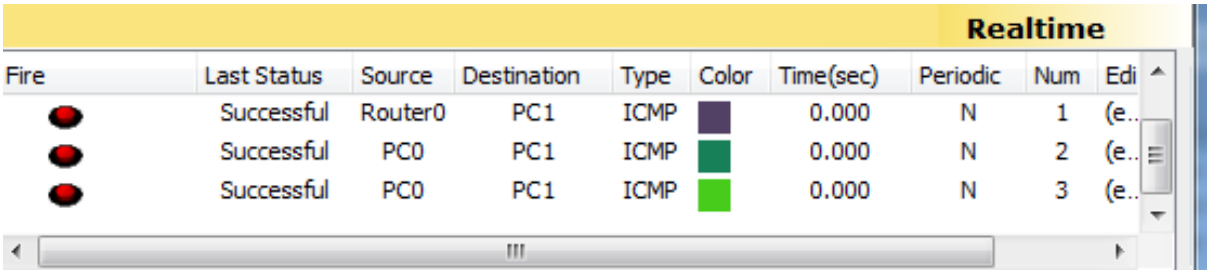
CODING:

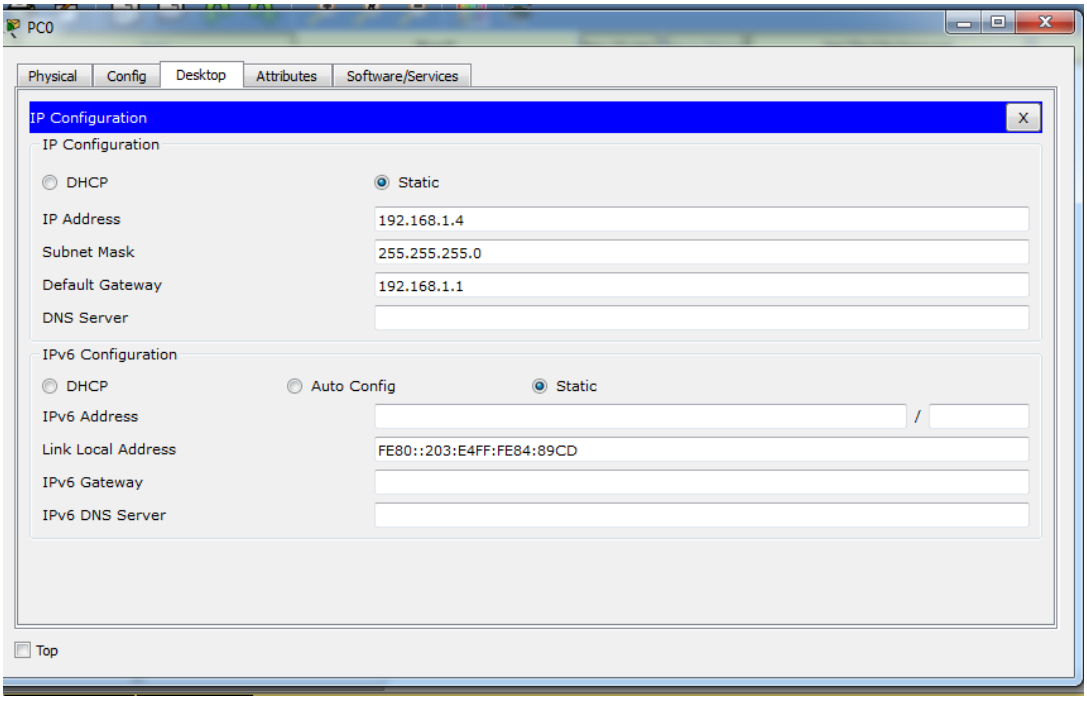
```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Fastethernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface Fastethernet0/1
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface FastEthernet0/0
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#exit
```

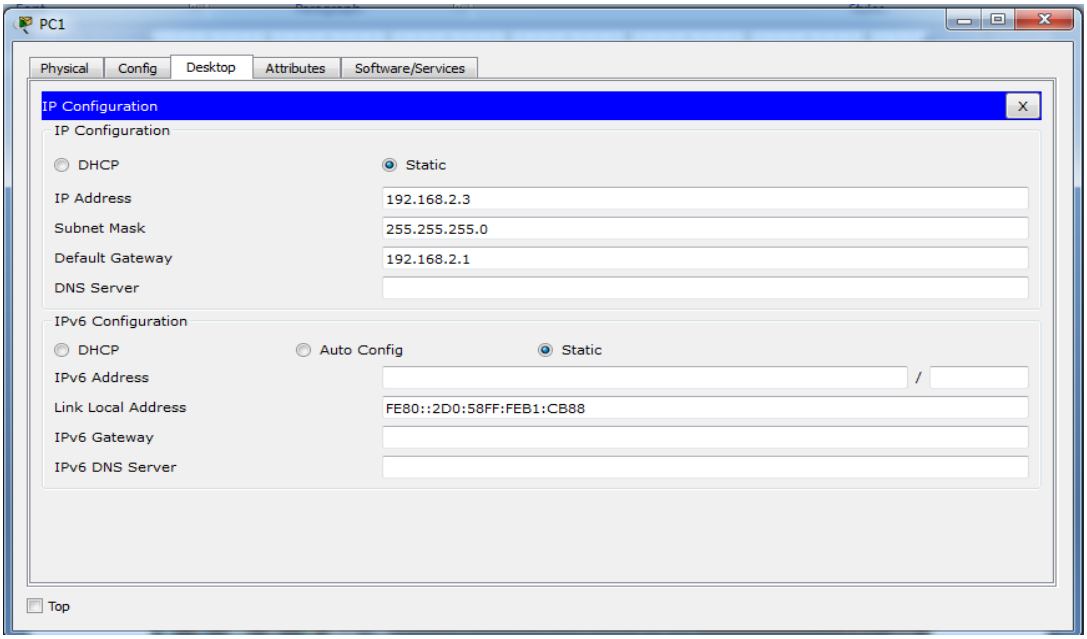
OUTPUT:




Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical
Back
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Environment: 02:30:00
1841
Router0
PC-PT
PC0
PC-PT
PC1
Time: 00:25:12
Power Cycle Devices
Fast Forward Time
Realtime
Scenario 0
New
Delete
Toggle PDU List Window
Copper Cross-Over
Fire Last Status Source Destination Type Color Time(sec) Periodic Num E
Successful Router0 PC1 ICMP 0.000 N 1
Successful PC0 PC1 ICMP 0.000 N 2
Successful PC0 PC1 ICMP 0.000 N 3
1:34 PM
1/6/2018


Realtime
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edi
Successful Router0 PC1 ICMP 0.000 N 1
Successful PC0 PC1 ICMP 0.000 N 2
Successful PC0 PC1 ICMP 0.000 N 3


PC0
Physical
Config
Desktop
Attributes
Software/Services
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
192.168.1.4
Subnet Mask
255.255.255.0
Default Gateway
192.168.1.1
DNS Server
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address
FE80::203:E4FF:FE84:89CD
IPv6 Gateway
IPv6 DNS Server
Top



RESULT:

The device interfaces are connected, configured and verified successfully.

EX.NO:4 STATIC & DYNAMIC ADDRESSING SERVICES

DATE : 02-01-2018

AIM:

To implement static and dynamic addressing services for post in a LAN environment.

ALGORITHM:

Step 1: Start the configuration.

Step 2: Click start-> All programs-> cisco packet tracer.

Step 3: Create topology with router generic, switch 2960 and PC and connection using copper straight through.

Step 4: CLT will normally appear in user mode (router).

Step 5: Use the command enable" and "conf t" to privileged mode and global configuration mode.

Step 6: Use the command enable" and "conf t" to privileged mode And interface fastethernet0/0 to assign an IP address and submit mask to connect the switch.

Step 7: Use the commend IP DHCP(Dynamic Host Control Protocol) pool cisco for network and default router.

Step 8: Use the command IP DHCP excluded address for excluding different address.

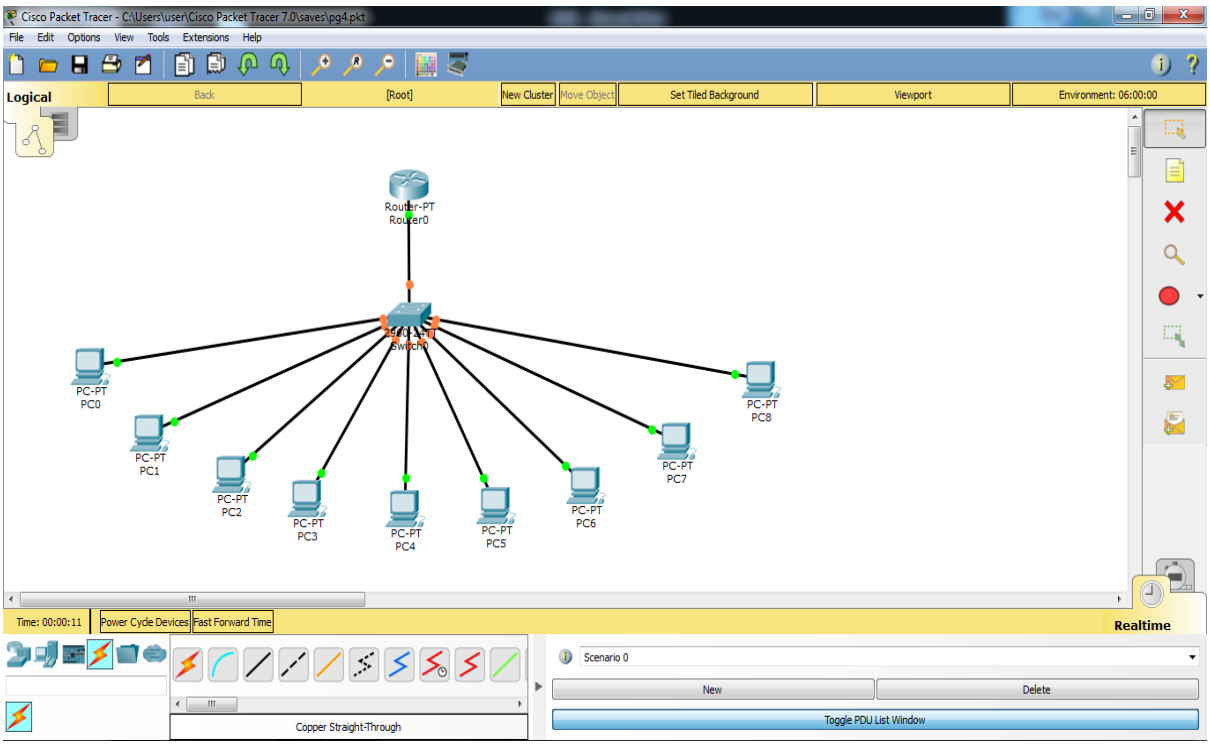
Step 9: Click add simple PDU(P) to send the packet one system to another through router and switch and check PDU list window.

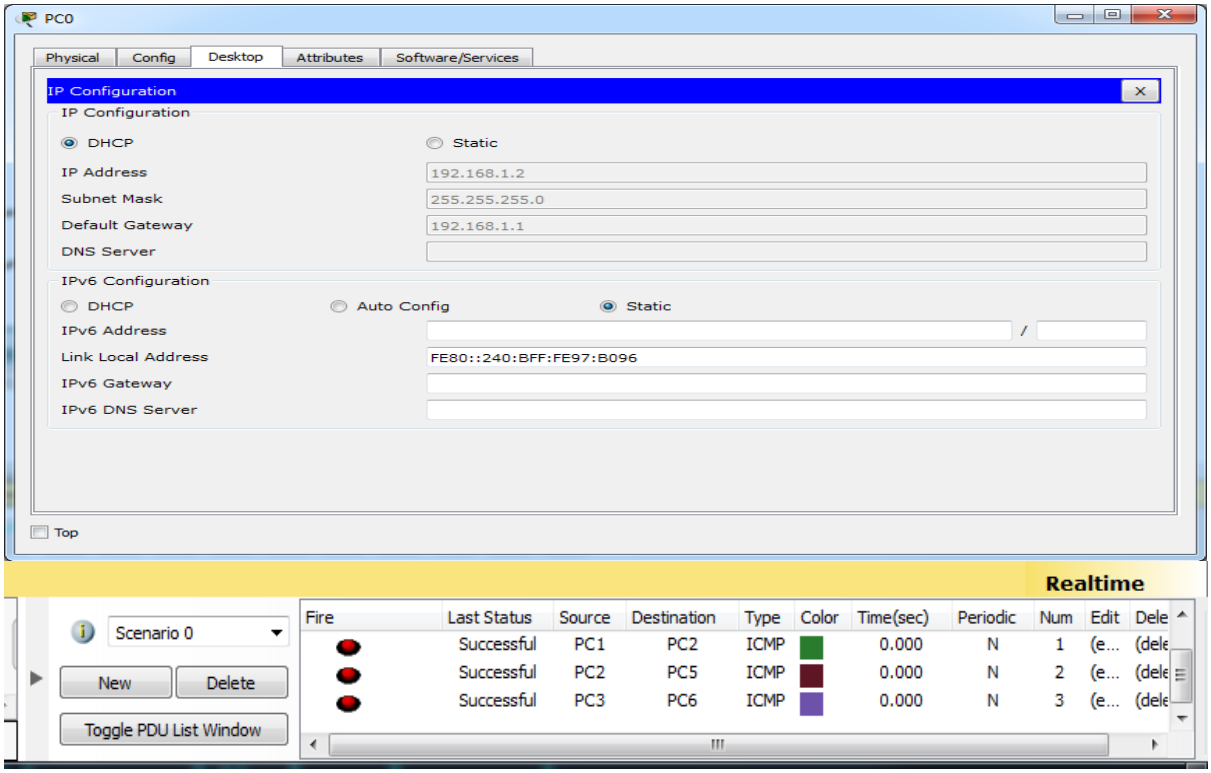
Step 10: Stop the configuration.

CODING:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Fastethernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#ipdhcp pool cisco
Router(dhcp-config)#network 192.168.1.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.1.1
Router(dhcp-config)#exit

Router(config)#ipdhcp excluded-address 192.168.1.4 192.168.1.7
Router(config)#exit
```

OUTPUT:





RESULT:

Thus the static and dynamic addressing services for hosts in a LAN are successfully implemented.

EX.NO:5 IDENTIFY AND CORRECT THE PROBLEMS IN THE CONFIGURATON

DATE : 06-01-2018

AIM:

To identify and correct common problems associated with ip addressing and host configuration.

ALGORITHM:

Step 1: Start the configuration.

Step 2: Click start-> All programs-> cisco packet tracer.

Step3: Create topology with router 1841, PC-PTPC0, PC-PTPC1.

Step 4: CLT will normally appear in user mode (router).

Step 5: Use the command “enable” and “conf t” to privileged mode and configuration mode.

Step 6: Use the command interface fastethernet0/0 and 0/1 to assign an IP address and subnet mask to connect the device interface.

Step 7: In command prompt give the ping command the data packets is received or lost.

Step 8: Click PC-PTPC0 -> desktop-> IP configuration assign IP address and default gateway.

Step 9: Click add simple PDU(P) to send the packet from one system to another through router.

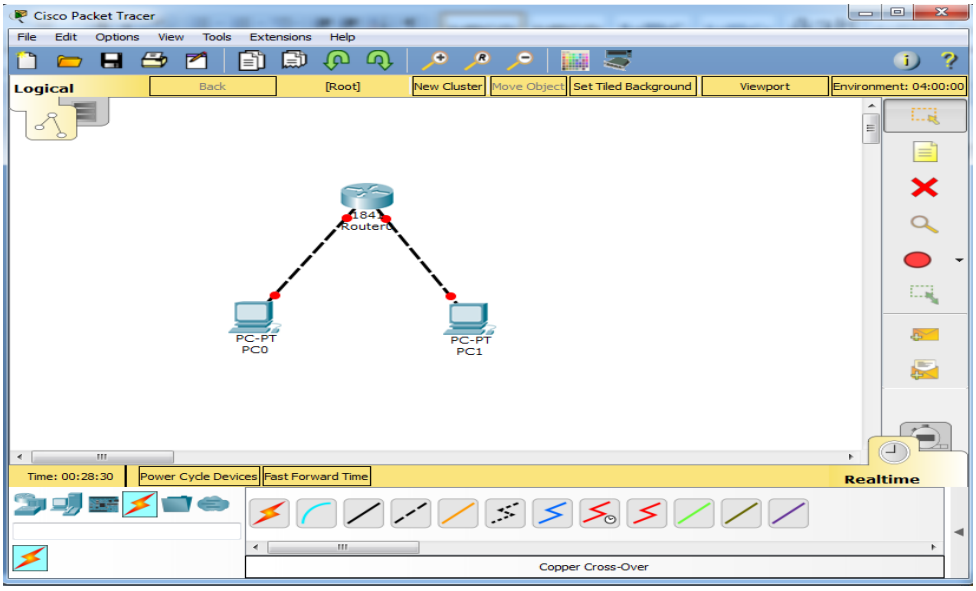
Step 10: Click PDU list window to check the status about the packets.

Step 11: Stop the configuration.

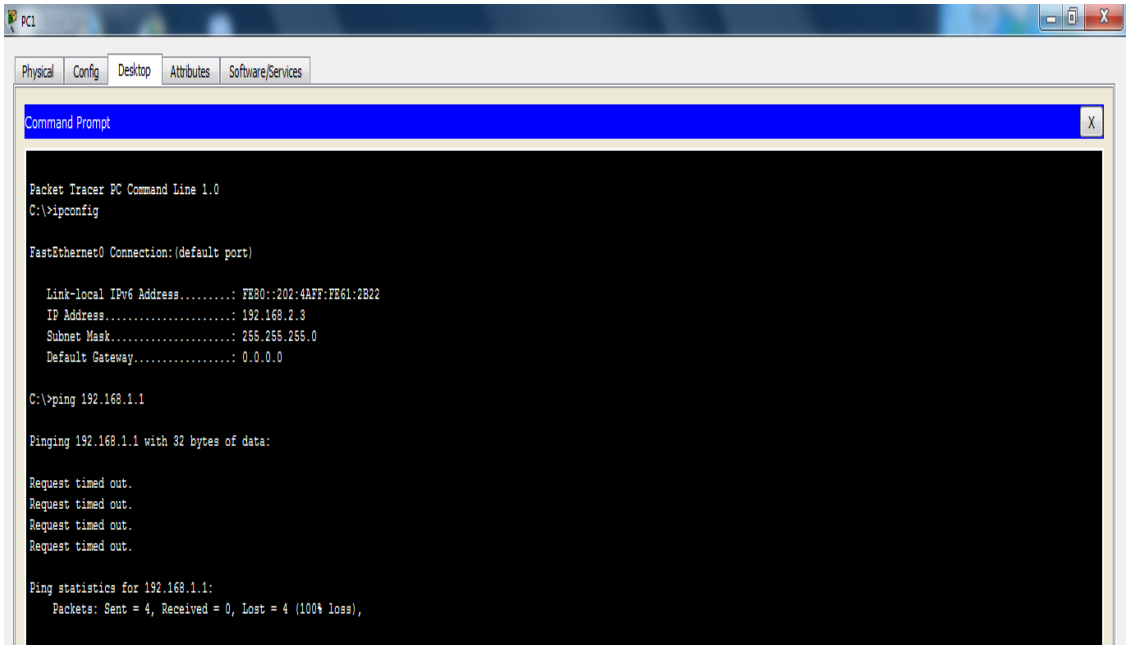
CODING:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Fastethernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface Fastethernet0/1
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface FastEthernet0/0
Router(config)#exit
Router(config)#interface FastEthernet0/1
Router(config)#exit
```

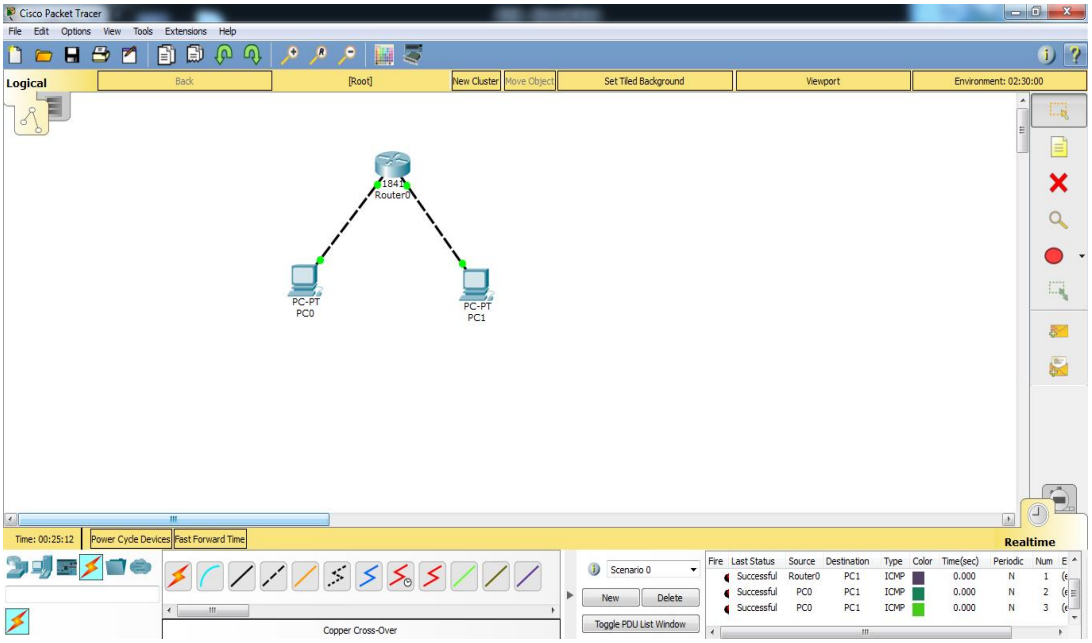
OUTPUT:

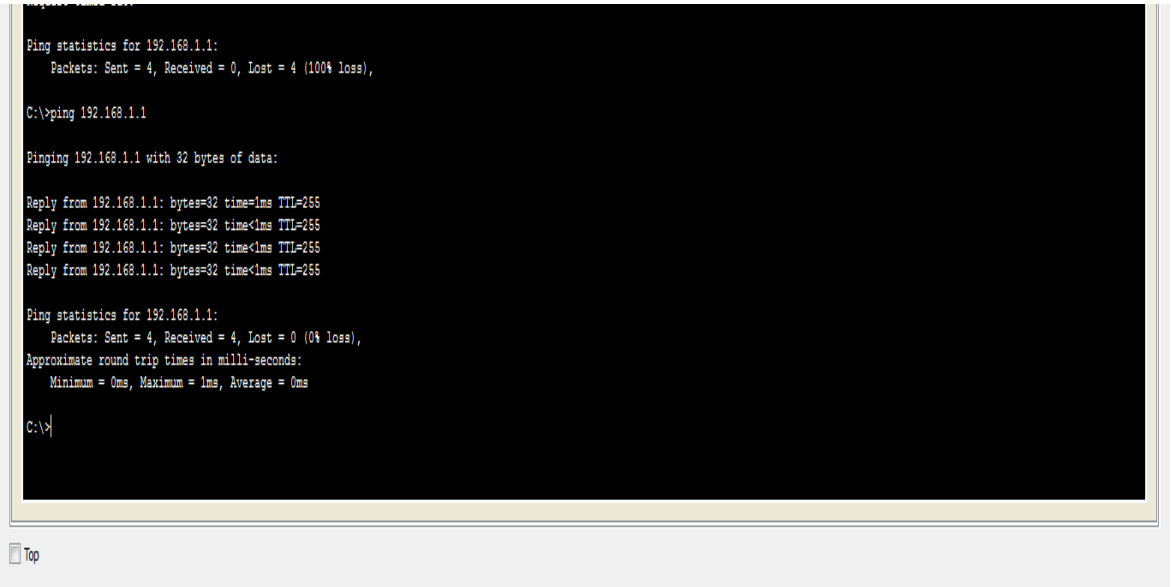


ERROR:



ERROR RECTIFIED :





RESULT:

The common problems are identified and rectified.

EX.NO:6 RIPV2 TROUBLE SHOOT

DATE : 23-01-2018

AIM:

To configure verify and trouble shoot RIPV2.

ALGORITHM:

Step 1: start the configuration.

Step 2: Click start-> All programs-> cisco packet tracer.

Step 3: Create topology with router generic switch 2960 and pc connections using copper cross wire.

Step 4: CLI will normally appear in user mode.

Step5: Use the command "enable" and "conf t" to privileged and global configuration mode.

Step 6: Use the command "enable" and "conf t" to privileged and Interface FastEthernet0/0 to assign and IP address and subnet mask to connect the router. Type show ctrl serial 0/0/0.

Step 7: Use a command interface serial 0/0/0 & 0/0/1 for ip address, clock rate band width and no shutdown.

Step 8: Router1 and router1 as same as step7 process for interface serial 0 and 1.

Step 9: Using a command router rip to declare the network address for router0,1 and 2.

Step 10: Using command prompt display the output.

Step 11: Stop the process.

CODING:

Router0:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface Fastethernet 0/0
Router(config-if)#ip address 10.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#exit

Router#show controllers serial0/0/0
Interface Serial0/0/0
Hardware is PowerQUICC MPC860
DCE V.35, clock rate 2000000
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask [CIMR]=0x00200000, In-srv [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
[PAODR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
[PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
[PCSO]=0xC20, [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
rmd(68012830): status 9000 length 60C address 3B6DAC4
rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.1.249 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial0/0/1
Router(config-if)#ip address 192.168.1.254 255.255.255.252
```

Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router1:

Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.1.250 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface serial0/0/1
Router(config-if)#ip address 192.168.1.246 255.255.255.252
Router(config-if)#clock rate 64000
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
Router(config-if)#exit

Router2:

Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface fastethernet0/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.1.245 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#interface serial0/0/1
Router(config-if)#ip address 192.168.1.253 255.255.255.252
Router(config-if)#no shutdown

Router(config-if)#exit
Router(config)#exit

Router rip:

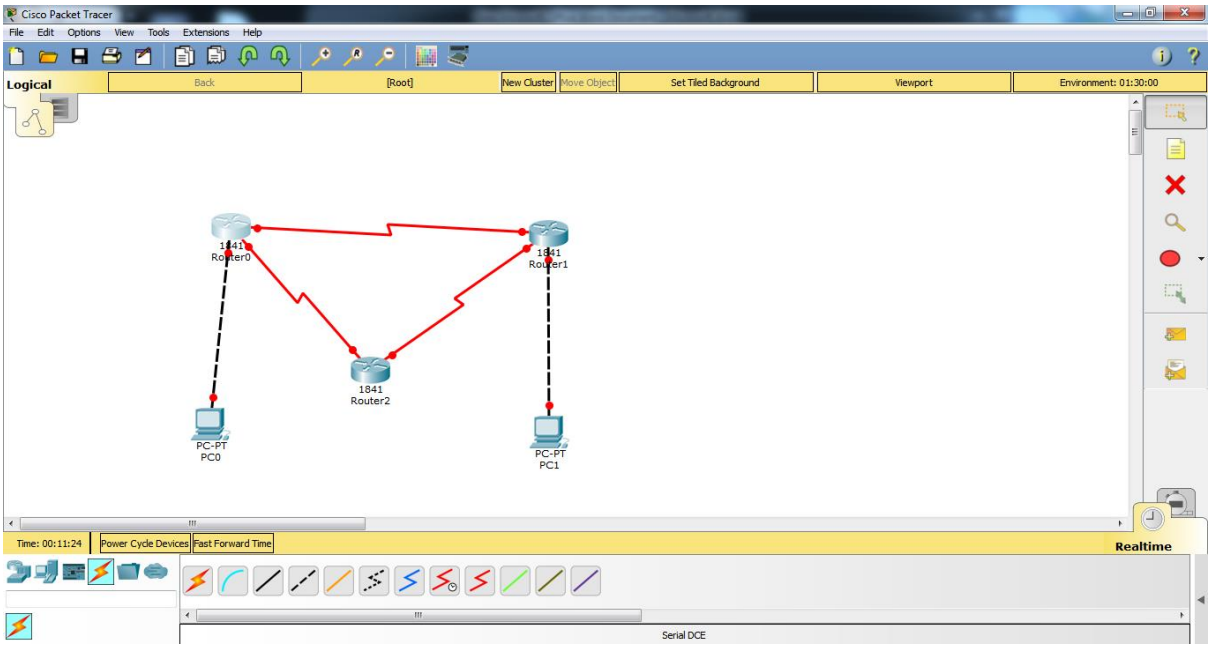
Router0:
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 192.168.1.252
Router(config-router)#network 192.168.1.248

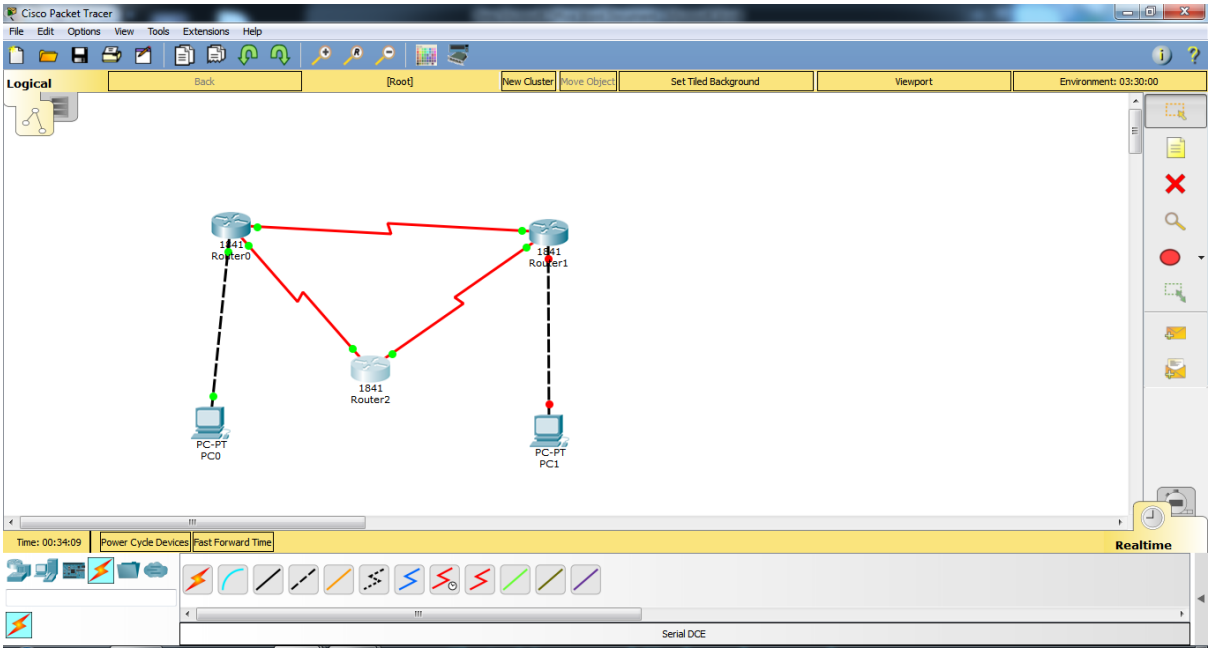
Router1:
Router(config)#router rip
Router(config-router)#network 192.168.1.244
Router(config-router)#network 192.168.1.248

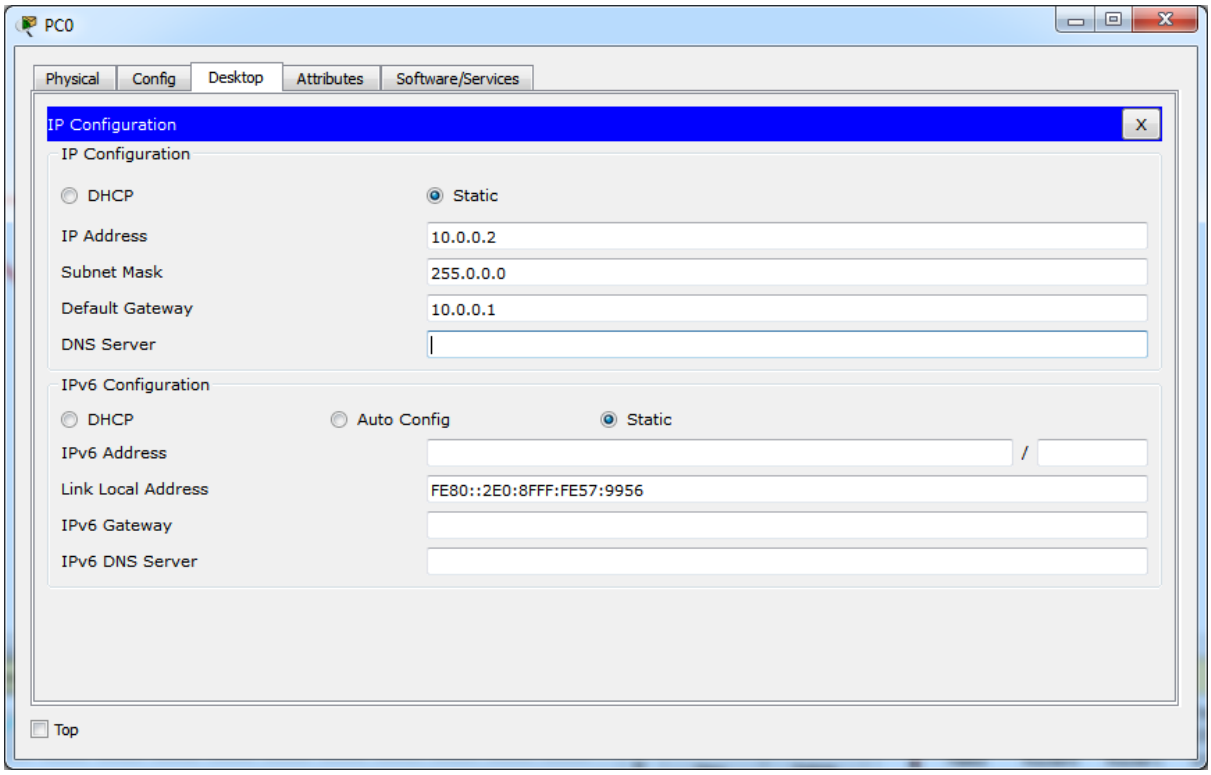
Router2:
Router(config)#router rip
Router(config-router)#network 20.0.0.0
Router(config-router)#network 192.168.1.252
Router(config-router)#network 192.168.1.244

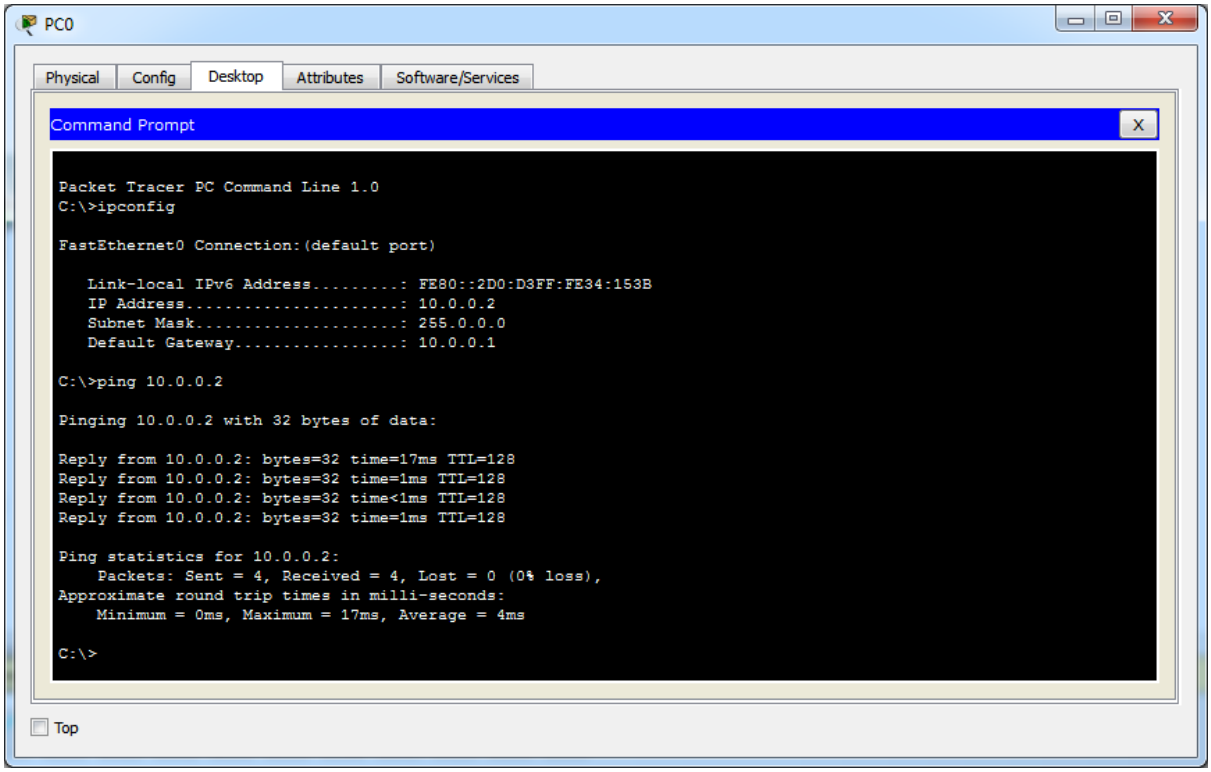
C:\>tracert 10.0.0.2
Tracing route to 10.0.0.2 over a maximum of 30 hops:
1 1 ms 4 ms 4 ms 10.0.0.2
Trace complete.

OUTPUT:




Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical
Back
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
Environment: 03:30:00
1841
Router0
1841
Router1
1841
Router2
PC-PT
PC0
PC-PT
PC1
Time: 00:34:09
Power Cycle Devices
Fast Forward Time
Realtime
Serial DCE


PC0
Physical
Config
Desktop
Attributes
Software/Services
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
10.0.0.2
Subnet Mask
255.0.0.0
Default Gateway
10.0.0.1
DNS Server
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
/
Link Local Address
FE80::2E0:8FFF:FE57:9956
IPv6 Gateway
IPv6 DNS Server
Top



RESULT:

Thus the configuration and troubleshooting of RIPv2 is successfully implemented.

EX.NO:7 VERIFY STATIC & DEFAULT ROUTE

DATE : 05-02-2018

AIM:

To perform and verify routing configuration task for a static and default router given.

ALGORITHM:

Step 1: start the configuration.

Step 2: Click start-> All programs-> cisco packet tracer.

Step 3: Create topology with router generic switch 2960 and pc connections using copper cross wire.

Step 4: CLI will normally appear in user mode. Use the command “enable” and “conf t” to privileged and global configuration mode.

Step 5: Declare host name and use the command Banner not d*word* to display the word.

Step 6: Using the cmd interface serial 0/0/0 and 0/0/1 and dsp the cmd show control serial 0/0/0.

Step 7: To perform the routing operation static router-> set a ip routing. Default route->set the packet seta new ip routing no route->set a new ip routing

Step 8: Use ping command to view the results.

Step 9: Stop the process.

CODING

Router0:

Continue with configuration dialog? [yes/no]: n

press RETURN to get started!

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#exit

Router#show controllers serial0/0/0
Interface Serial0/0/0
Hardware is PowerQUICC MPC860
DTE V.35 TX and RX clocks detected
idb at 0x81081AC4, driver data structure at 0x81084AC0
SCC Registers:
General [GSMR]=0x2:0x00000000, Protocol-specific [PSMR]=0x8
Events [SCCE]=0x0000, Mask [SCCM]=0x0000, Status [SCCS]=0x00
Transmit on Demand [TODR]=0x0, Data Sync [DSR]=0x7E7E
Interrupt Registers:
Config [CICR]=0x00367F80, Pending [CIPR]=0x0000C000
Mask [CIMR]=0x00200000, In-srv [CISR]=0x00000000
Command register [CR]=0x580
Port A [PADIR]=0x1030, [PAPAR]=0xFFFF
[PAODR]=0x0010, [PADAT]=0xCBFF
Port B [PBDIR]=0x09C0F, [PBPAR]=0x0800E
[PBODR]=0x00000, [PBDAT]=0x3FFFD
Port C [PCDIR]=0x00C, [PCPAR]=0x200
[PCSO]=0xC20, [PCDAT]=0xDF2, [PCINT]=0x00F
Receive Ring
rmd(68012830): status 9000 length 60C address 3B6DAC4
rmd(68012838): status B000 length 60C address 3B6D444
Transmit Ring
tmd(680128B0): status 0 length 0 address 0
tmd(680128B8): status 0 length 0 address 0
Router#conf t

```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.0.253 255.255.255.252
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#exit
```

Router1:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.0.254 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial0/0/1
Router(config-if)#ip address 192.168.0.249 255.255.255.252
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#exit
```

Router2:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.0.250 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial0/0/1
```

Router(config-if)#ip address 192.168.0.245 255.255.255.252
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#bandwidth 64
Router(config-if)#no shutdown
Router(config-if)#exit

Router(config)#

Router3:

Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 20.0.0.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial0/0/0
Router(config-if)#ip address 192.168.0.246 255.255.255.252
Router(config-if)#no shutdown
Router(config-if)#exit

Static route

Router0:

Router(config)#ip route 20.0.0.0 255.0.0.0 192.168.0.254

Router1:

Router(config)#ip route 10.0.0.0 255.0.0.0 192.168.0.253
Router(config)#ip route 20.0.0.0 255.0.0.0 192.168.0.250

Router2:

Router(config)#ip route 10.0.0.0 255.0.0.0 192.168.0.249
Router(config)#ip route 20.0.0.0 255.0.0.0 192.168.0.246

Router3:

Router(config)#ip route 10.0.0.0 255.0.0.0 192.168.0.245

No route:

Router0:

Router(config)#no ip route 20.0.0.0 255.0.0.0 192.168.0.254

Router1:

Router(config)#no ip route 10.0.0.0 255.0.0.0 192.168.0.253
Router(config)#no ip route 20.0.0.0 255.0.0.0 192.168.0.250

Router2:

Router(config)#no ip route 10.0.0.0 255.0.0.0 192.168.0.249
Router(config)# no ip route 20.0.0.0 255.0.0.0 192.168.0.246

Router3:

Router(config)#no ip route 10.0.0.0 255.0.0.0 192.168.0.245

Default route:

Router0:

Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.254

Router1:

Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.253
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.250

Router2:

Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.249
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.246

Router3:

Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.0.245

Command prompt:

Packet Tracer PC Command Line 1.0

C:\>ipconfig

FastEthernet0 Connection:(default port)

Link-local IPv6 Address.....: FE80::20C:85FF:FE3D:DA76
IP Address.....: 20.0.0.2
Subnet Mask.....: 255.0.0.0
Default Gateway.....: 10.0.0.1

C:\>ipconfig

FastEthernet0 Connection:(default port)

Link-local IPv6 Address.....: FE80::20C:85FF:FE3D:DA76
IP Address.....: 20.0.0.2

Subnet Mask.....: 255.0.0.0
Default Gateway.....: 20.0.0.1

Static route:

C:\>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=4ms TTL=252
Reply from 10.0.0.2: bytes=32 time=6ms TTL=252
Reply from 10.0.0.2: bytes=32 time=3ms TTL=252
Reply from 10.0.0.2: bytes=32 time=3ms TTL=252

Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 3ms, Maximum = 6ms, Average = 4ms

Default route:

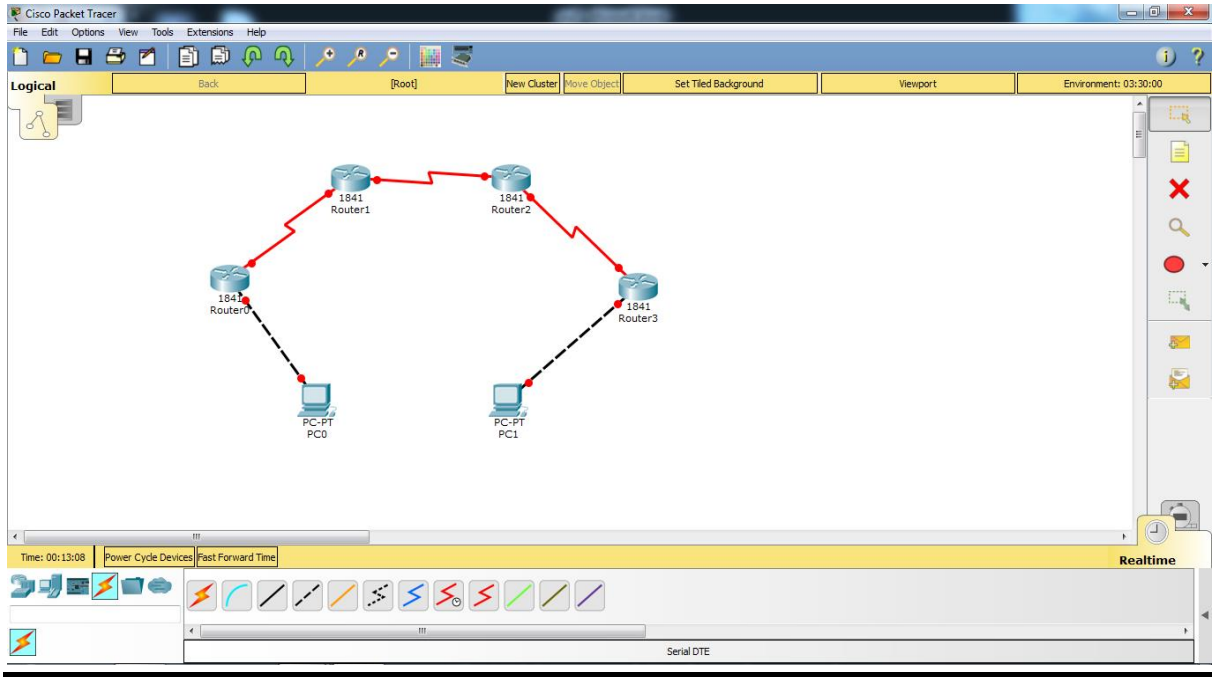
C:\>ping 10.0.0.2

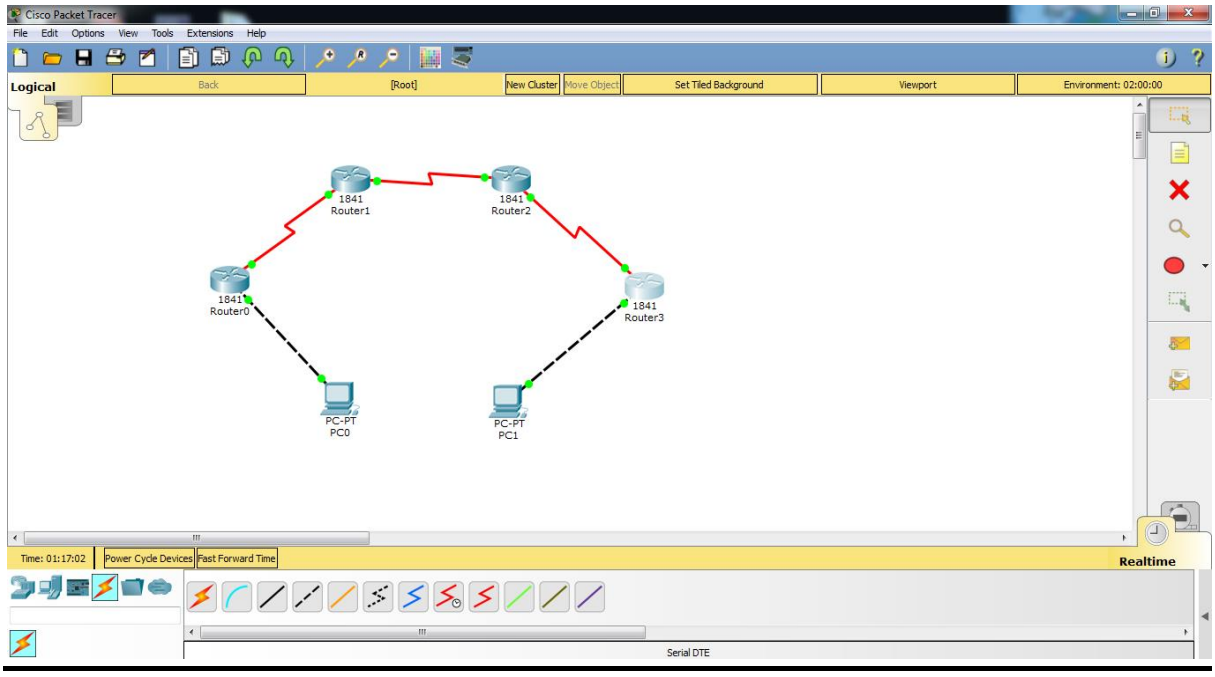
Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=4ms TTL=252
Reply from 10.0.0.2: bytes=32 time=5ms TTL=252
Reply from 10.0.0.2: bytes=32 time=5ms TTL=252
Reply from 10.0.0.2: bytes=32 time=5ms TTL=252

Ping statistics for 10.0.0.2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 4ms, Maximum = 5ms, Average = 4ms

OUTPUT:





RESULT:

Thus the static and default routing has been successfully done.

EX.NO:8 VERIFY AND TROUBLESHOOT NAT OPERATION

DATE : 13-02-2018

AIM:

To configure verify and trouble shoot NAT operation for data router.

ALGORITHM:

Step 1: start the configuration.

Step 2: Click start-> All programs-> cisco packet tracer.

Step 3: Create topology with router generic switch 2960 and pc connections using copper cross wire.

Step 4: CLI will normally appear in user mode. Use the command “enable” and “conf t” to privileged and global configuration mode.

Step 5: Connect the router using wire and local and global network connection.

Step 6: Declare the ip address for the router and end it.

Step 7: Set no ip routing for default gateway and then debug IPICNP.

Step 8: Declare the Nat function connection and then view result in ping.

Step 9: Stop the process.

CODING:

Router0:

Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>en

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

Router1:

Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 10.0.0.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface fastethernet0/1
Router(config-if)#ip address 212.100.100.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

Router2:

Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ip address 212.100.100.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

No ip routing:

Router0:

Router>en

Router#config t

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip routing
Router(config)#ip default-gateway 10.0.0.2

Router2:

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip routing
Router(config)#ip default-gateway 212.100.100.2

Debug ipicmp:

Router0:

Router#debugipicmp
ICMP packet debugging is on
Router#ping 212.100.100.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 212.100.100.1, timeout is 2 seconds:
...!

ICMP: echo reply rcvd, src 212.100.100.1, dst 10.0.0.1
!
Success rate is 40 percent (2/5), round-trip min/avg/max = 0/0/0 ms
Router#
ICMP: echo reply rcvd, src 212.100.100.1, dst 10.0.0.1

2. Ping after NAT function:

Router#ping 212.100.100.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 212.100.100.1, timeout is 2 seconds:
.!
ICMP: echo reply rcvd, src 212.100.100.1, dst 10.0.0.1
!
ICMP: echo reply rcvd, src 212.100.100.1, dst 10.0.0.1
!
ICMP: echo reply rcvd, src 212.100.100.1, dst 10.0.0.1
!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms
Router#
ICMP: echo reply rcvd, src 212.100.100.1, dst 10.0.0.1

Router2:

Router#debugipicmp
ICMP packet debugging is on
Router#ping 212.100.100.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 212.100.100.1, timeout is 2 seconds:
!
ICMP: echo reply sent, src 212.100.100.1, dst 212.100.100.1
ICMP: echo reply rcvd, src 212.100.100.1, dst 212.100.100.1
!
ICMP: echo reply sent, src 212.100.100.1, dst 212.100.100.1
ICMP: echo reply rcvd, src 212.100.100.1, dst 212.100.100.1
!
ICMP: echo reply sent, src 212.100.100.1, dst 212.100.100.1

ICMP: echo reply rcvd, src 212.100.100.1, dst 212.100.100.1
!
ICMP: echo reply sent, src 212.100.100.1, dst 212.100.100.1
ICMP: echo reply rcvd, src 212.100.100.1, dst 212.100.100.1

!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/12 ms
Router#
ICMP: echo reply sent, src 212.100.100.1, dst 212.100.100.1
ICMP: echo reply rcvd, src 212.100.100.1, dst 212.100.100.1

NAT Function:

Router>en

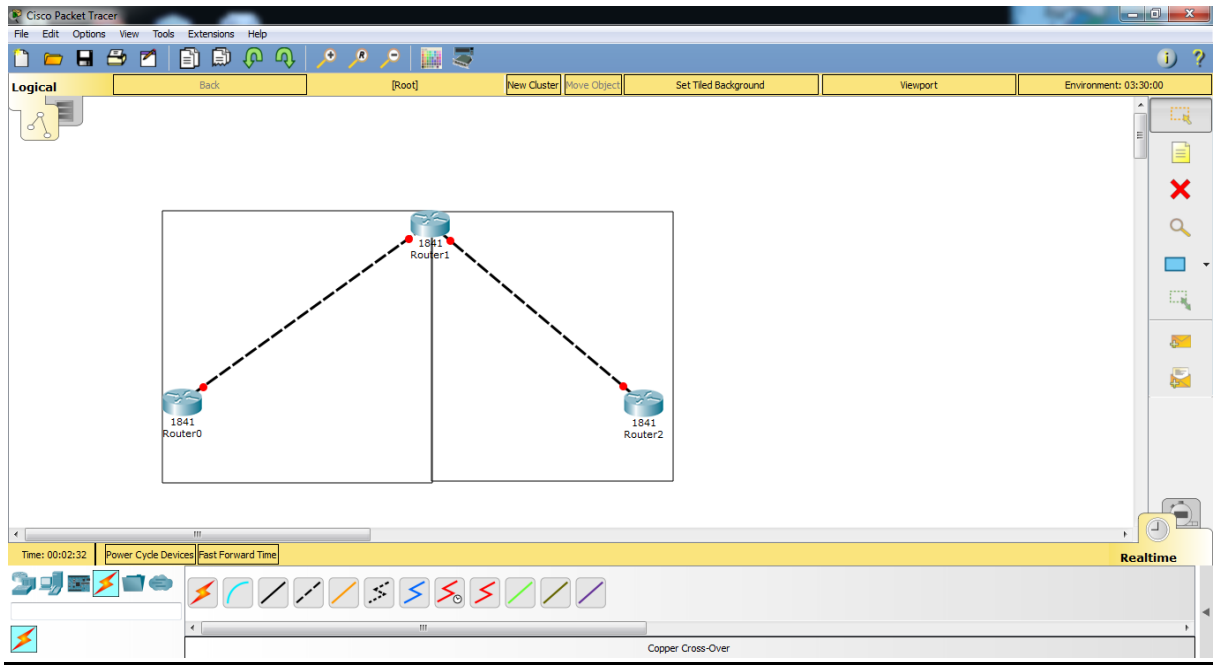
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#ipnat inside
Router(config-if)#exit
Router(config)#interface fastethernet0/1
Router(config-if)#ipnat outside
Router(config-if)#exit
Router(config)#ipnat inside source static 10.0.0.1 212.100.100.10
Router(config)#end
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#

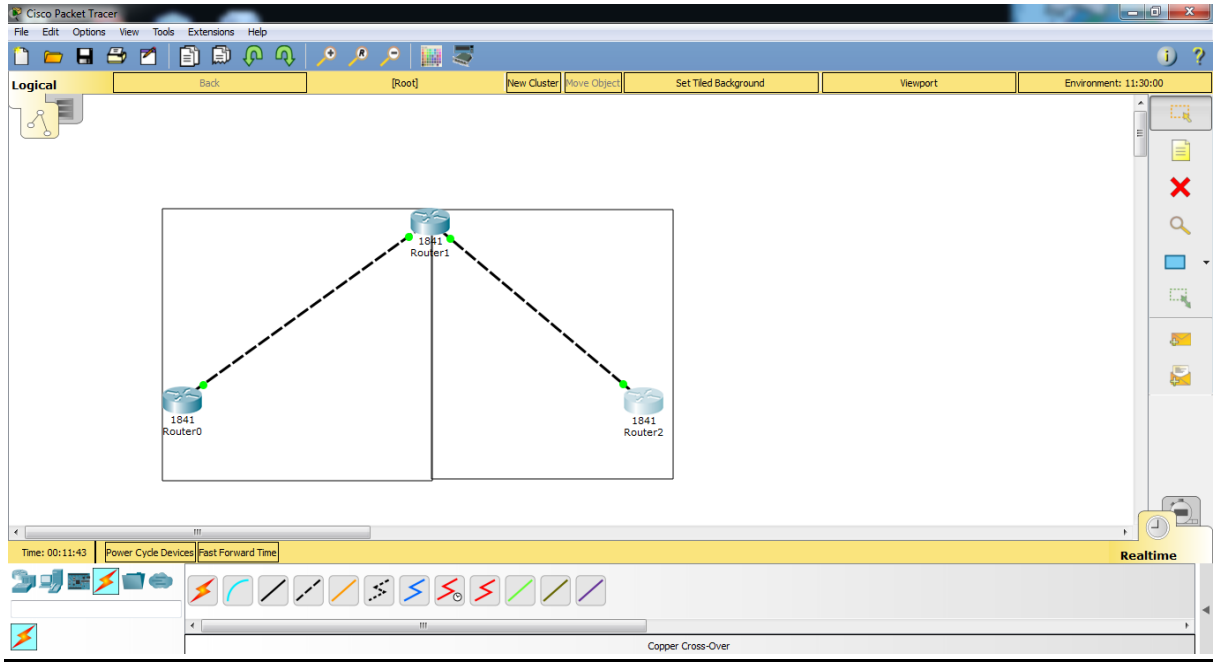
NAT Result:

Router#showipnat translations

Pro	Inside global	Inside local	Outside local	Outside global
---	212.100.100.10	10.0.0.1	---	---

OUTPUT:





RESULT:

Thus the verification and troubleshooting of NAT operation on a router has been successfully done.

EX.NO:9 PPP CONNECTION BETWEEN ROUTERS

DATE : 13-03-2018

AIM:

To configure and verify a PPP connection between routers.

ALGORITHM:

Step 1: start the configuration.

Step 2: Click start-> All programs-> cisco packet tracer.

Step 3: Create topology with router generic switch 2960 and pc connections using copper cross wire.

Step 4: CLI will normally appear in user mode. Use the command “enable” and “conf t” to privileged and global configuration mode.

Step 5: Declare host name and use the command Banner not d*word* to display the word.

Step 6: Use a command interface serial 0/0/0 to declare IP address.

Step 7: Use a command encapsulation ppp and clock rate and no shutdown.

Step 8: Use a command copy run start and show run to display output.

Step9: Router 1 is as same as router 0 for process

Step10: Stop the process

CODING

Router 0:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#clock set 02:21:24 23 jan 2018
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ro1
ro1(config)#banner motd *hai*
ro1(config)#enable password cisco
ro1(config)#enable secret msc
ro1(config)#line console 0
ro1(config-line)#login
% Login disabled on line 0, until 'password' is set
ro1(config-line)#password sindhu
ro1(config-line)#exit
ro1(config)#interface serial0/0/0
ro1(config-if)#ip address 10.0.0.1 255.0.0.0
ro1(config-if)#encapsulation ppp
ro1(config-if)#clock rate 9600
This command applies only to DCE interfaces
ro1(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
ro1(config-if)#exit
ro1(config)#exit
ro1#
%SYS-5-CONFIG_I: Configured from console by console
```

Router1:

```
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ro2
ro2(config)#banner motd *hello*
ro2(config)#interface serial 0/0/0
ro2(config-if)#ip address 10.0.0.5 255.0.0.0
ro2(config-if)#encapsulation ppp
ro2(config-if)#clock rate 1200
```

ro2(config-if)#no shutdown
ro2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ro2(config-if)#exit
ro2(config)#exit
ro2#
%SYS-5-CONFIG_I: Configured from console by console

copy run start:

Router0:

ro1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]

Router1:

ro2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]

show run:

Router0:

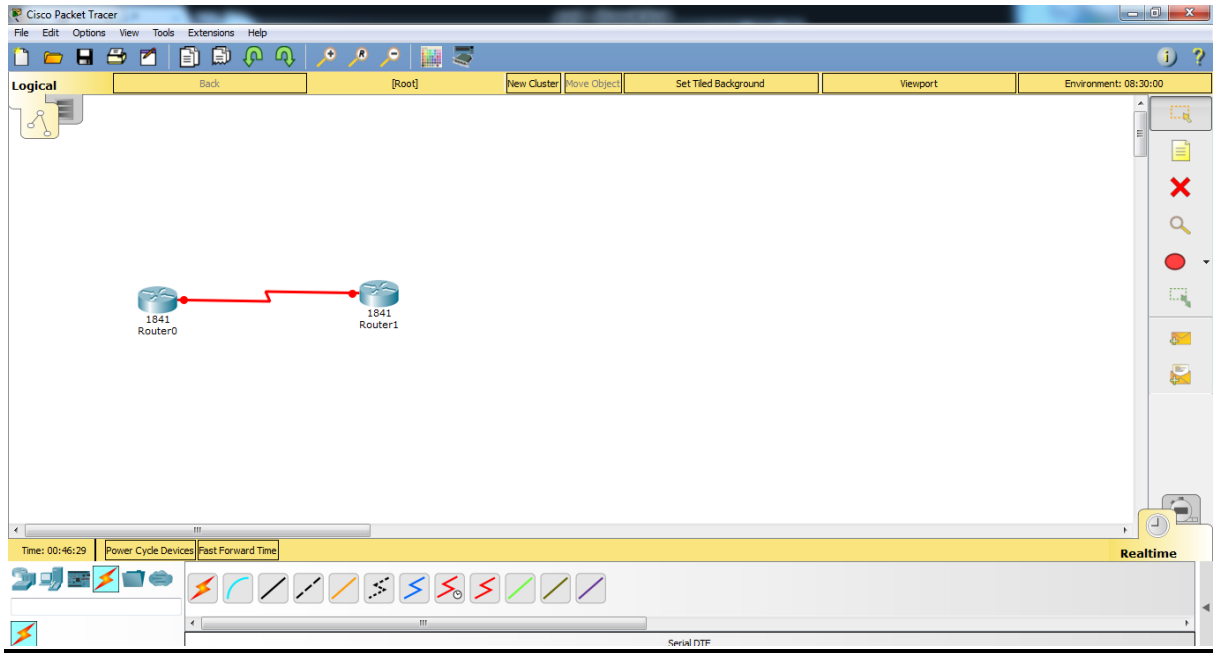
ro1#show run
Building configuration...
Current configuration : 807 bytes
!
version 12.4
no service timestamps log datetimemsec
no service timestamps debug datetimemsec
no service password-encryption
!
hostname ro1
!
!
!
enable secret 5 1mERr$A1hH/m/xInQUEVJndVBxy/
enable password cisco
!
!
!

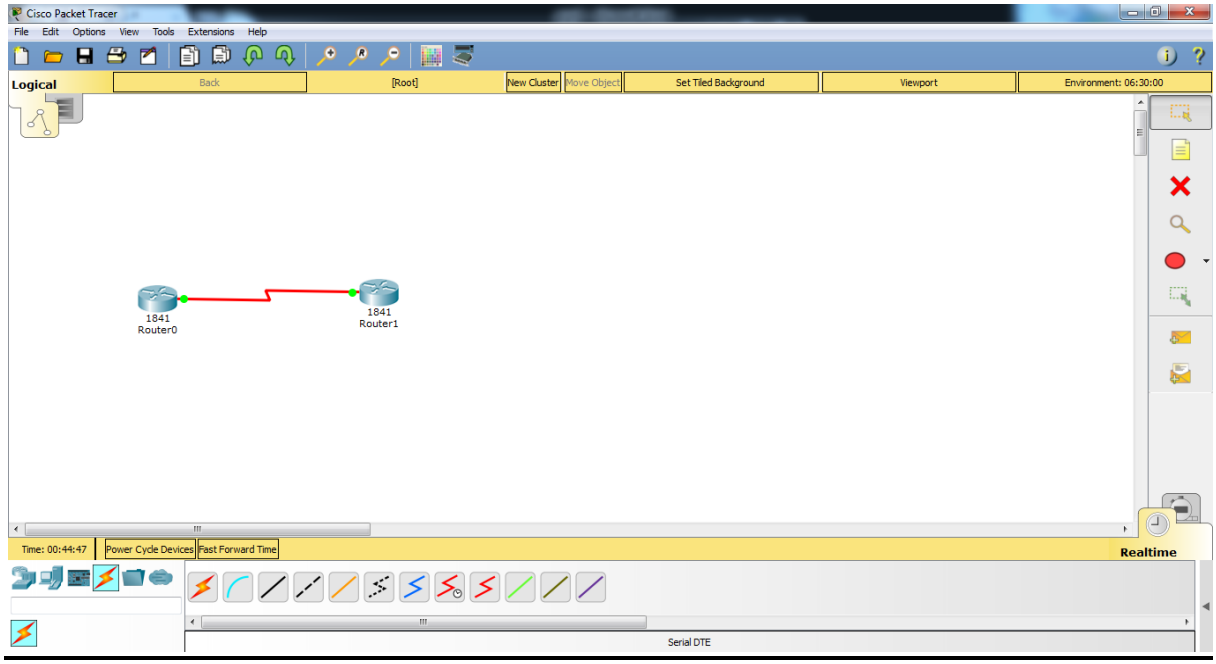
!
!
!
no ipcef
--More—

Router1:

ro2#show run
Building configuration...
Current configuration : 731 bytes
!
version 12.4
no service timestamps log datetimemsec
no service timestamps debug datetimemsec
no service password-encryption
!
hostname ro2
!
!
!
!
!
!
!
!
no ipcef
no ipv6 cef
!
!
--More—

OUTPUT:





RESULT:

Thus the configuration and verification of a PPP connection between the routers has been successfully done.