A

Project Report On

# CHAP on Packet Tracer

In a subject of

***Data Communications & Networking (2171008)***

BACHELOR OF ENGINEERING
In
ELECTRONICS AND COMMUNICATION ENGINEERING

By

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VALLABH VIDYANAGAR-388120
Academic Year- 2017-18

# CERTIFICATE

This is to certify that the project report entitled ***“CHAP on Packet Tracer”,*** submitted by **Shahnawaz Yusufzai (120080112036), Omkar Mudholkar (140080111031)** in the subject of the ***Data Communications & Networking (2171008)*** for the *Bachelor of Engineering in Electronics and Communication* of *BVM Engineering College, Vallabh Vidyanagar (Gujarat Technological University),* is the record of work carried out by them under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted for examination.

**Under The Guidance Of**
Prof Anish Vahora
Professor, EC Department.

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# ***OPEN-ENDED PROBLEM***

**AIM:** To study & simulate CHAP using CISCO PacketTracer.

**SOFTWARE:** CISCO PacketTracer 7.0

**THEORY:**

## CHAP

- CHAP provides protection against replay attacks by the peer through the use of an incrementally changing identifier and of a variable challenge-value.
- CHAP requires that both the client and server know the plaintext of the secret, although it is never sent over the network.
- The MS-CHAP variant does not require either peer to know the plaintext, but has been broken.
- Thus, CHAP provides better security as compared to Password Authentication Protocol (PAP).

## CHAP Working

CHAP is an authentication scheme used by Point to Point Protocol (PPP) servers to validate the identity of remote clients. CHAP periodically verifies the identity of the client by using a three-way handshake. This happens at the time of establishing the initial link (LCP), and may happen again at any time afterwards. The verification is based on a shared secret (such as the client user's password).

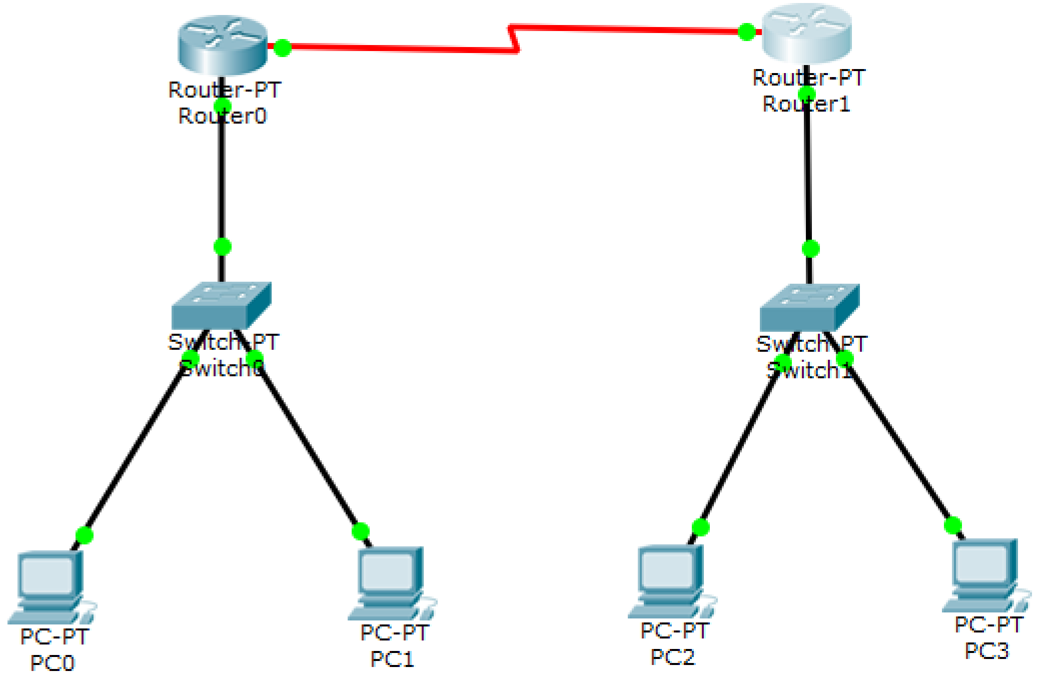
1. After the completion of the link establishment phase, the authenticator sends a "challenge" message to the peer.
2. The peer responds with a value calculated using a one-way hash function on the challenge and the secret combined.
3. The authenticator checks the response against its own calculation of the expected hash value. If the values match, the authenticator acknowledges the authentication; otherwise it should terminate the connection.
4. At random intervals the authenticator sends a new challenge to the peer and repeats steps 1 through 3.

# PROCEDURE:

[1] Place the various physical blocks (router, switch & PC) using the Logical View of Packet Tracer.
[2] Make necessary connections using Copper Straight-Through wires.
[3] Configure CLI options of the two routers.
[4] Configure IP Addressing scheme for the four PCs.
[5] Pinging the PC2 from PC0
[6] Program the Router for routing mechanism &
encapsulation PPP, authentication CHAP.
[7] Connection is been established. Now you can send message for Data Transfer.

# IMPLEMENTATION:

**Logical View**



## Router Configuration

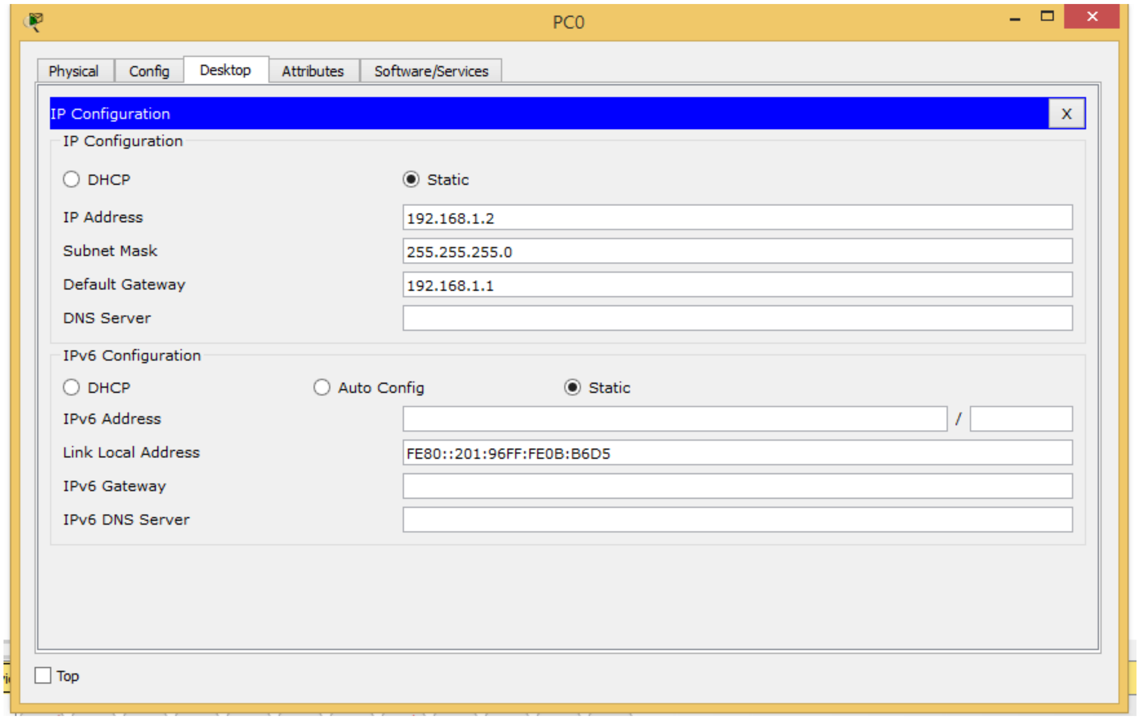
### For  Router0

```
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>ena
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip add 192.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#int s2/0
Router(config-if)#ip add 192.168.2.1 255.255.255.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#net 192.168.1.0
Router(config-router)#net 192.168.2.0
Router(config-router)#
Router(config-router)#^Z
                      ^
% Invalid input detected at '^' marker.
Router(config-router)#wr
                      ^
% Invalid input detected at '^' marker.
Router(config-router)#exit
Router(config)#
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

## For Router1

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

Router>ena
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip add 192.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state
to up

Router(config-if)#exit
Router(config)#int s2/0
Router(config-if)#ip add 192.168.2.1 255.255.255.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#net 192.168.1.0
Router(config-router)#net 192.168.2.0
Router(config-router)#
Router(config-router)#^Z
                      ^
% Invalid input detected at '^' marker.

Router(config-router)#wr
                      ^
% Invalid input detected at '^' marker.

Router(config-router)#exit
Router(config)#
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

# IP configuration of PCs



IP Configuration

IP Configuration

○ DHCP ● Static

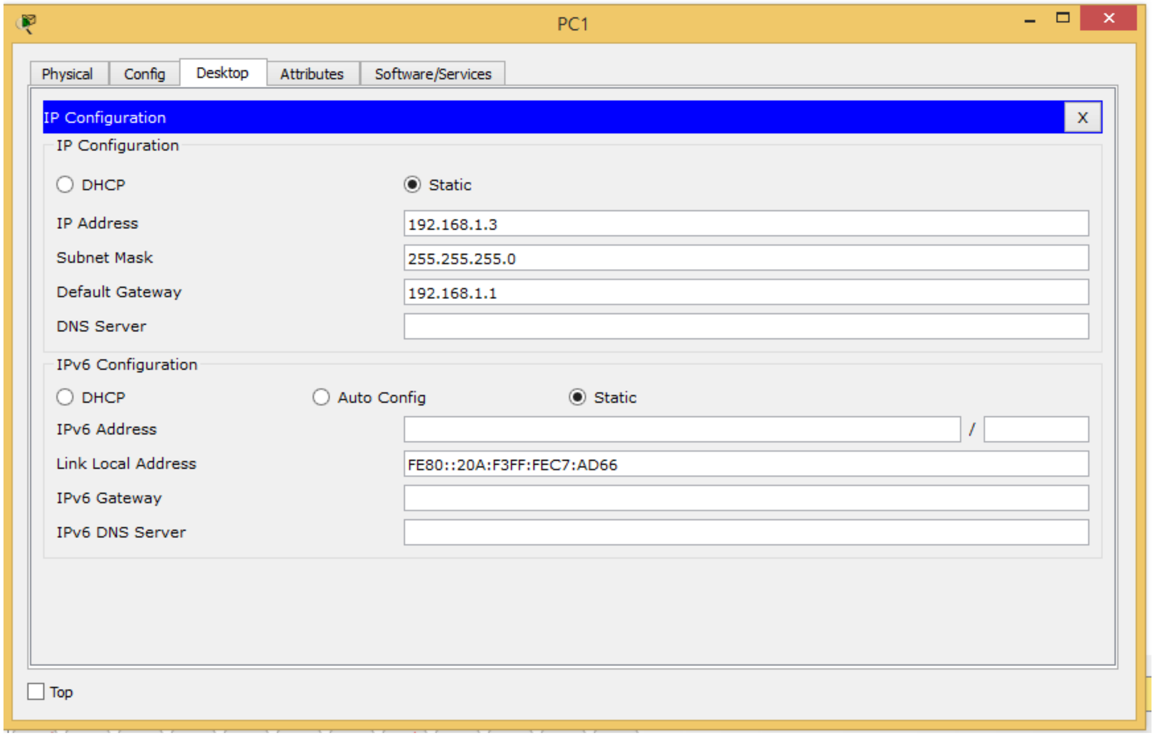
| | |
|---|---|
| IP Address | 192.168.1.2 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.1.1 |
| DNS Server | |

IPv6 Configuration

○ DHCP ○ Auto Config ● Static

| | |
|---|---|
| IPv6 Address | / |
| Link Local Address | FE80::201:96FF:FE0B:B6D5 |
| IPv6 Gateway | |
| IPv6 DNS Server | |

□ Top



IP Configuration

IP Configuration

○ DHCP ● Static

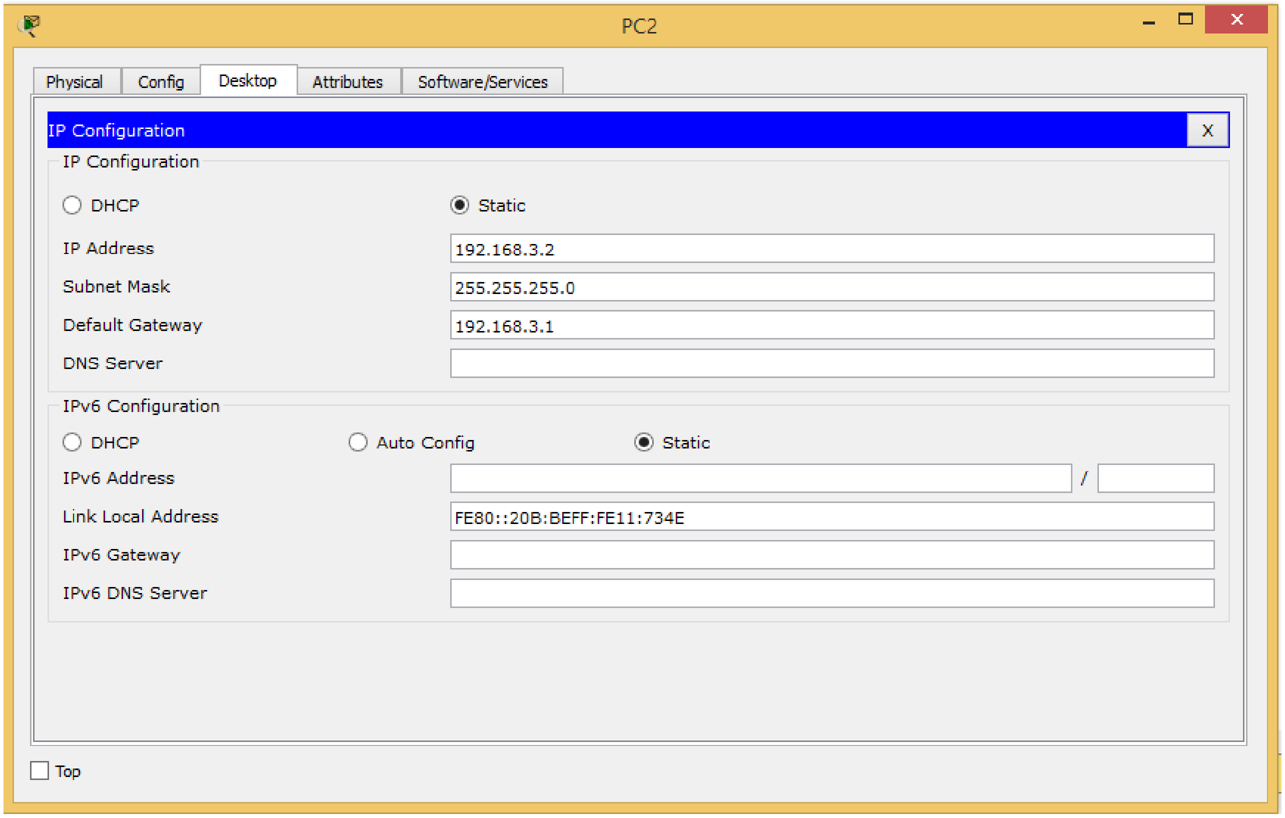
| | |
|---|---|
| IP Address | 192.168.1.3 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.1.1 |
| DNS Server | |

IPv6 Configuration

○ DHCP ○ Auto Config ● Static

| | |
|---|---|
| IPv6 Address | / |
| Link Local Address | FE80::20A:F3FF:FEC7:AD66 |
| IPv6 Gateway | |
| IPv6 DNS Server | |

□ Top



IP Configuration

IP Configuration

○ DHCP ● Static

IP Address 192.168.3.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.3.1

DNS Server

IPv6 Configuration

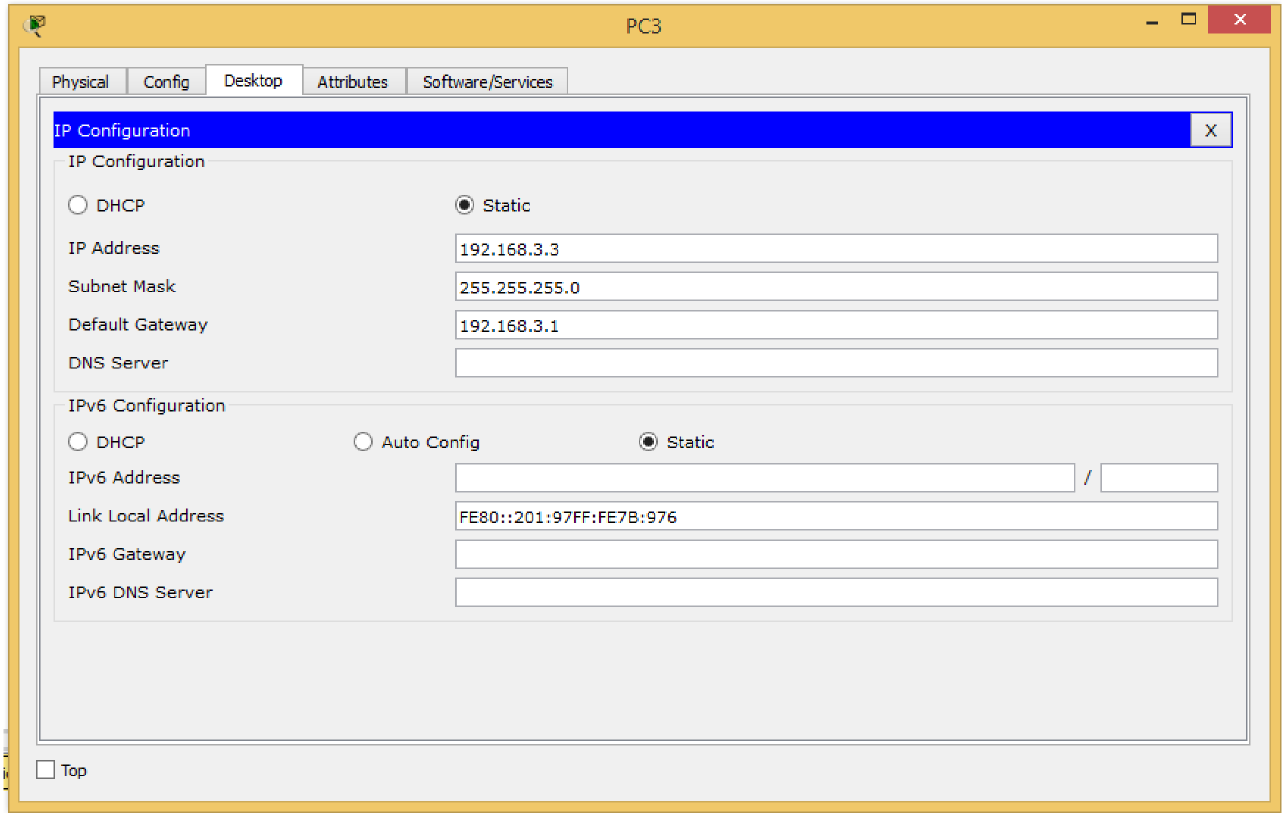
○ DHCP ○ Auto Config ● Static

IPv6 Address /

Link Local Address FE80::20B:BEFF:FE11:734E

IPv6 Gateway

IPv6 DNS Server



IP Configuration

IP Configuration

○ DHCP ● Static

IP Address 192.168.3.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.3.1

DNS Server

IPv6 Configuration

○ DHCP ○ Auto Config ● Static

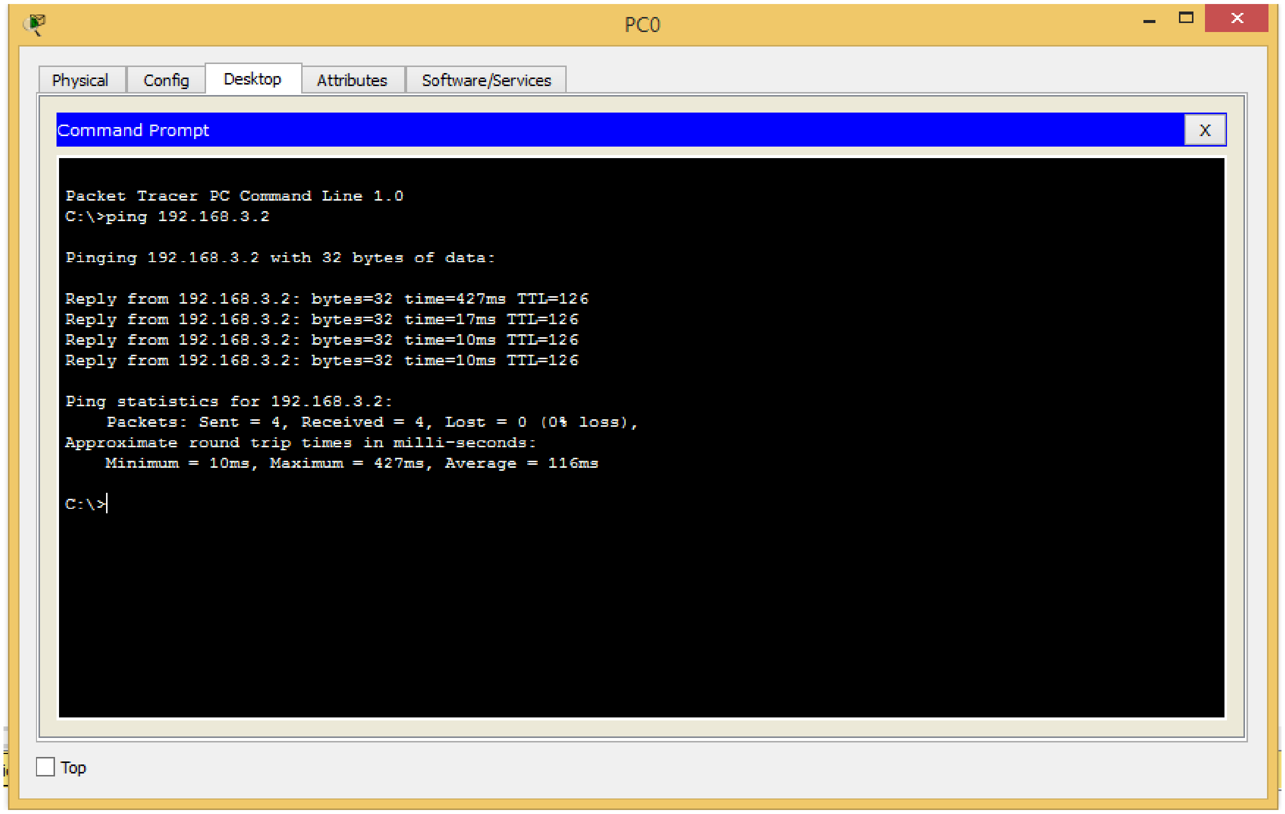
IPv6 Address /

Link Local Address FE80::201:97FF:FE7B:976

IPv6 Gateway

IPv6 DNS Server

# Pinging the PC2 from PC0



```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=427ms TTL=126
Reply from 192.168.3.2: bytes=32 time=17ms TTL=126
Reply from 192.168.3.2: bytes=32 time=10ms TTL=126
Reply from 192.168.3.2: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 427ms, Average = 116ms

C:\>
```

# For CHAP Configuration

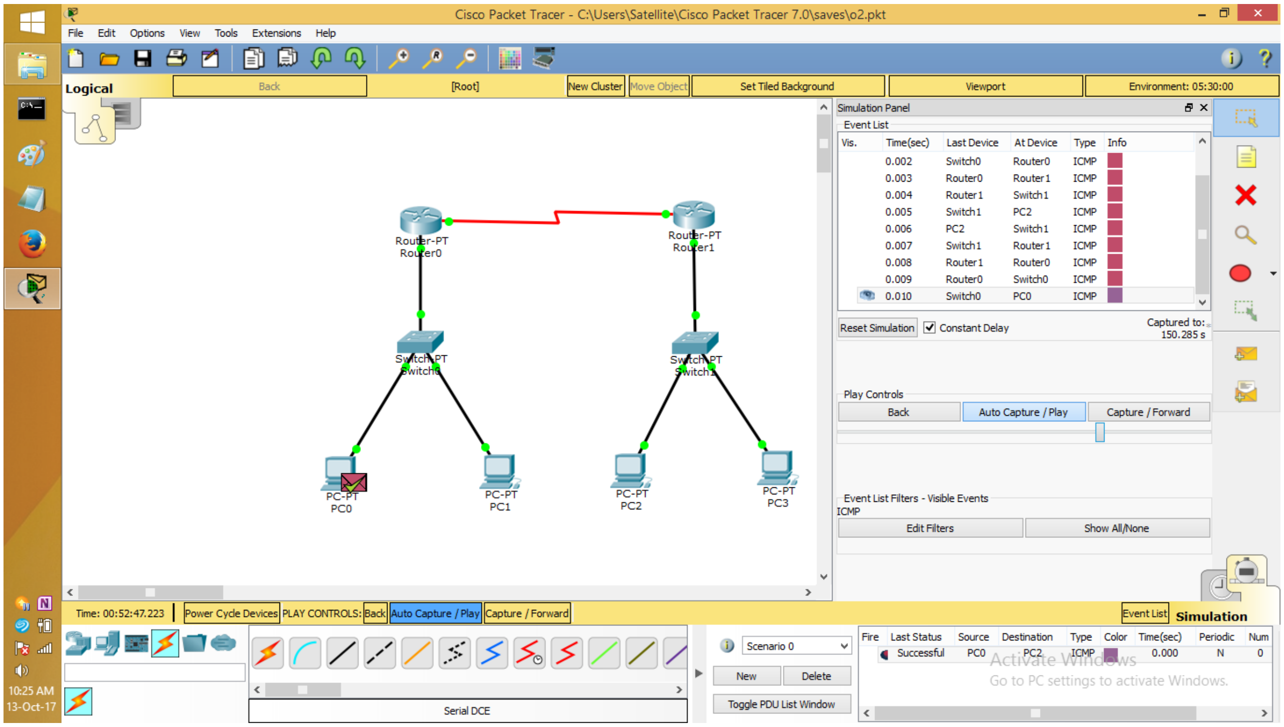
## For Router0

```
Router>ena
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname r1
r1(config)#username r2 pass 12345
r1(config)#int s2/0
r1(config-if)#enc
% Incomplete command.
r1(config-if)#encapsulation ppp
r1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to
down

r1(config-if)#ppp authentication cha
r1(config-if)#ppp authentication chap
r1(config-if)#^Z
r1#
%SYS-5-CONFIG_I: Configured from console by console
```

## For Router1

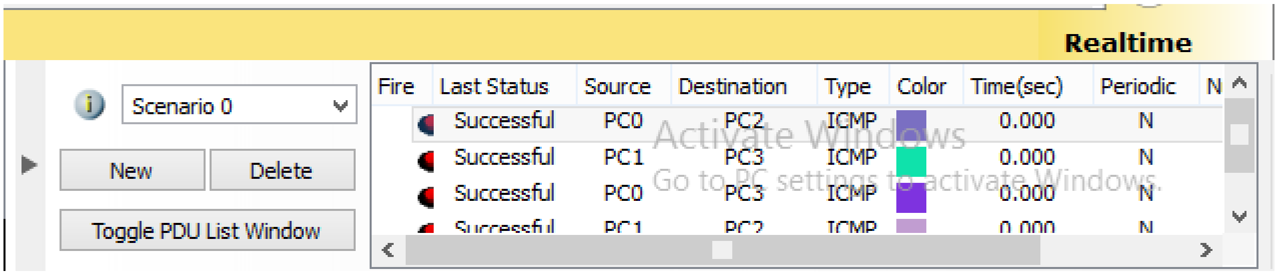
```
Router>ena
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname r2
r2(config)#username r1 pass 12345
r2(config)#int s2/0
r2(config-if)#encapsulation ppp
r2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

r2(config-if)#ppp authentication chap
r2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

r2(config-if)#^Z
r2#
%SYS-5-CONFIG_I: Configured from console by console
```

# Communication is established & Ready for Data Transfer



| Vis. | Time(sec) | Last Device | At Device | Type | Info |
|---|---|---|---|---|---|
| | 0.002 | Switch0 | Router0 | ICMP | 🟥 |
| | 0.003 | Router0 | Router1 | ICMP | 🟥 |
| | 0.004 | Router1 | Switch1 | ICMP | 🟥 |
| | 0.005 | Switch1 | PC2 | ICMP | 🟥 |
| | 0.006 | PC2 | Switch1 | ICMP | 🟥 |
| | 0.007 | Switch1 | Router1 | ICMP | 🟥 |
| | 0.008 | Router1 | Router0 | ICMP | 🟥 |
| | 0.009 | Router0 | Switch0 | ICMP | 🟥 |
| 👁 | 0.010 | Switch0 | PC0 | ICMP | 🟪 |

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num |
|---|---|---|---|---|---|---|---|---|
| ● | Successful | PC0 | PC2 | ICMP | 🟪 | 0.000 | N | 0 |



| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | N |
|---|---|---|---|---|---|---|---|---|
| ● | Successful | PC0 | PC2 | ICMP | 🟪 | 0.000 | N | |
| ● | Successful | PC1 | PC3 | ICMP | 🟩 | 0.000 | N | |
| ● | Successful | PC0 | PC3 | ICMP | 🟪 | 0.000 | N | |
| ● | Successful | PC1 | PC2 | ICMP | 🟪 | 0.000 | N | |