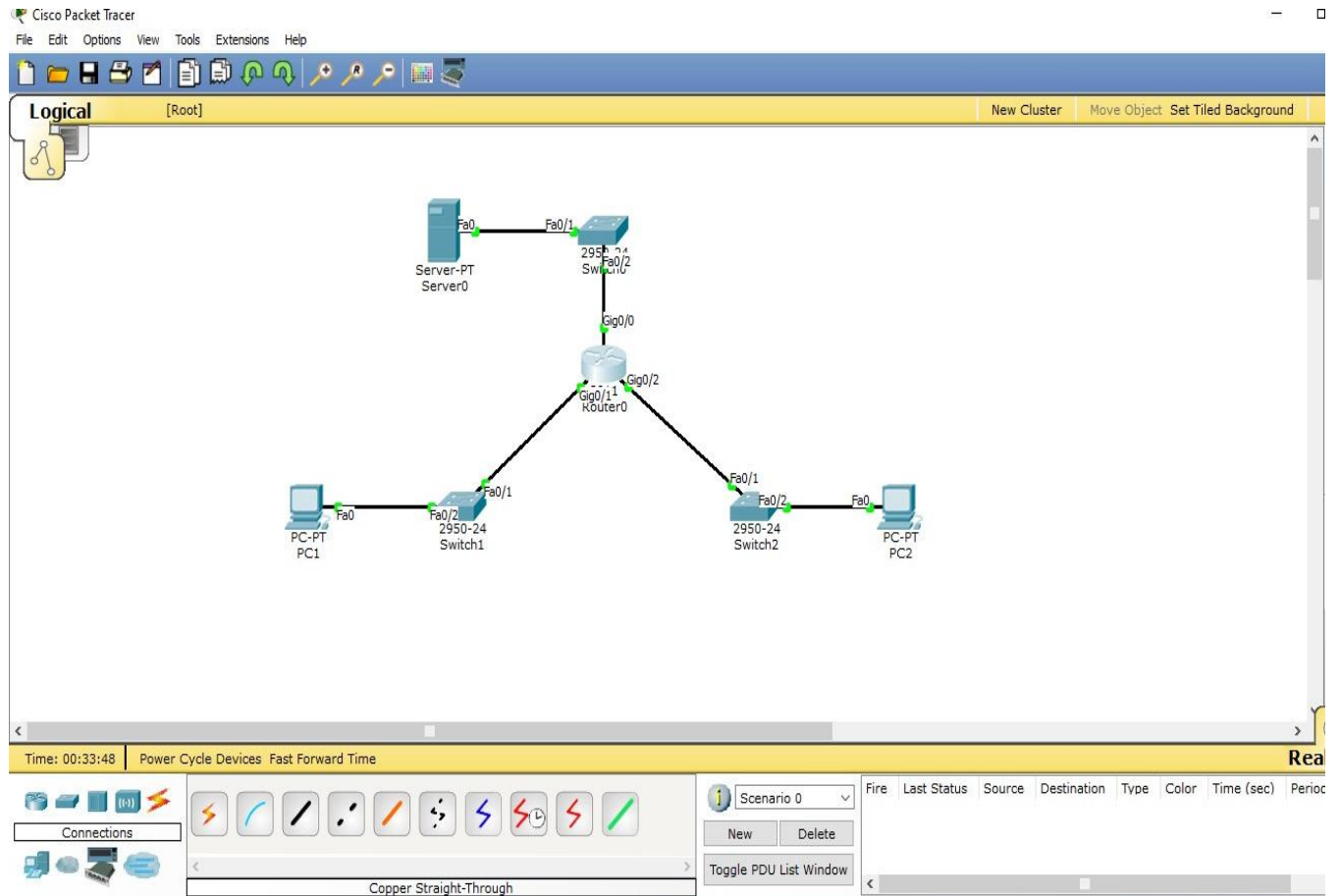


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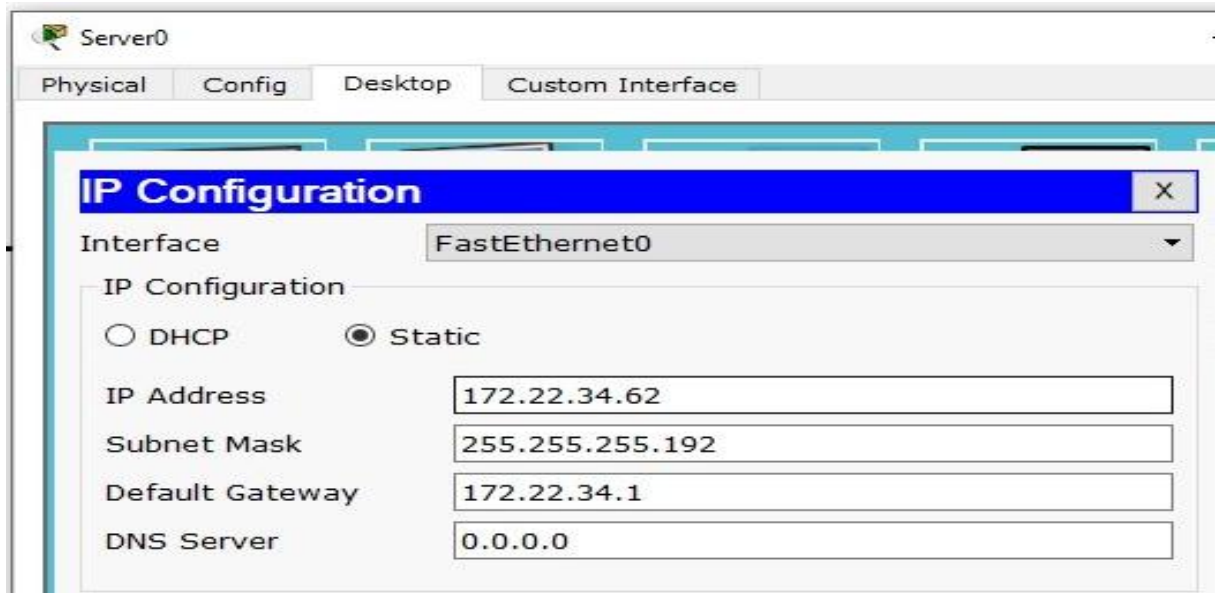
- Aim : Configuring Extended ACLs

➤ Topology Diagram



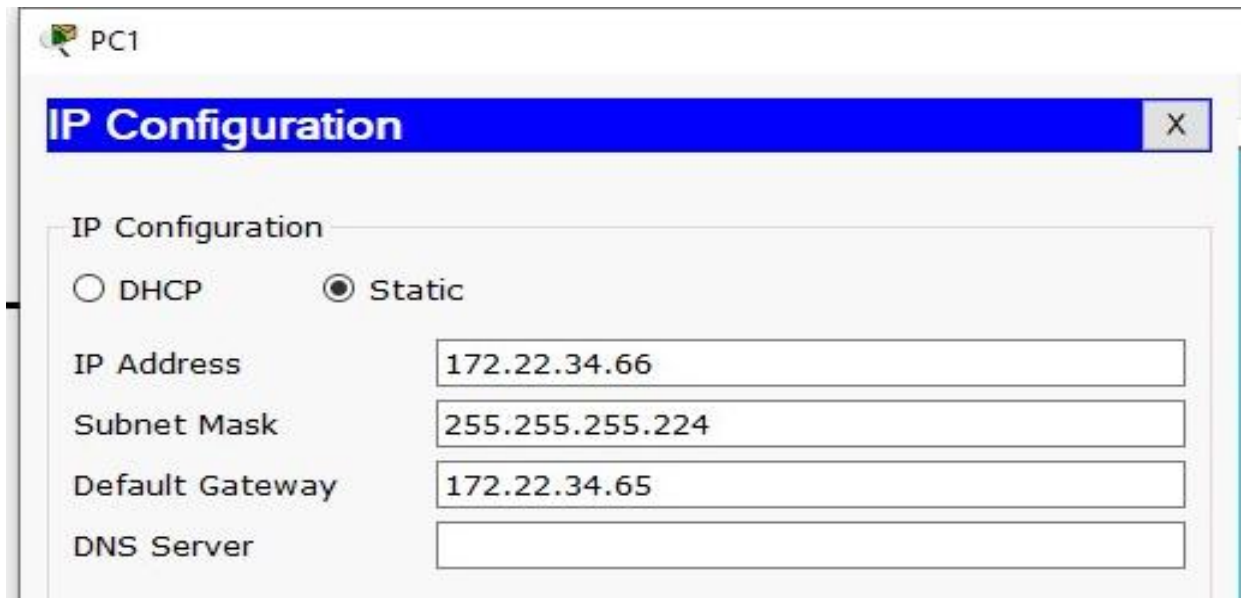
Date : 24/01/2024
Practical No : 3A

➤ Assign IP Addresses



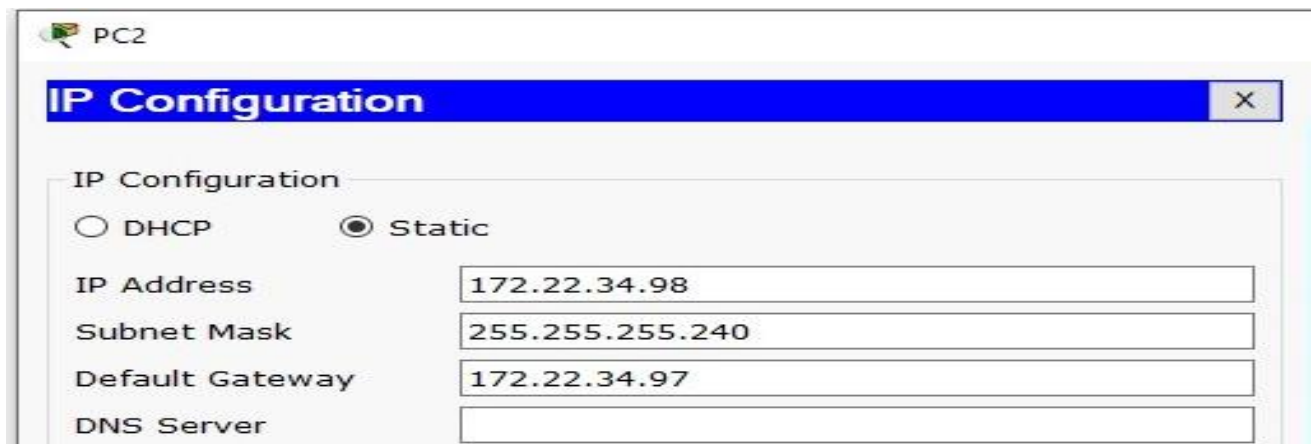
The screenshot shows the 'Server0' configuration window with the 'Config' tab selected. The 'IP Configuration' dialog is open, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for IP configuration. The fields are filled with the following values:

Field	Value
IP Address	172.22.34.62
Subnet Mask	255.255.255.192
Default Gateway	172.22.34.1
DNS Server	0.0.0.0

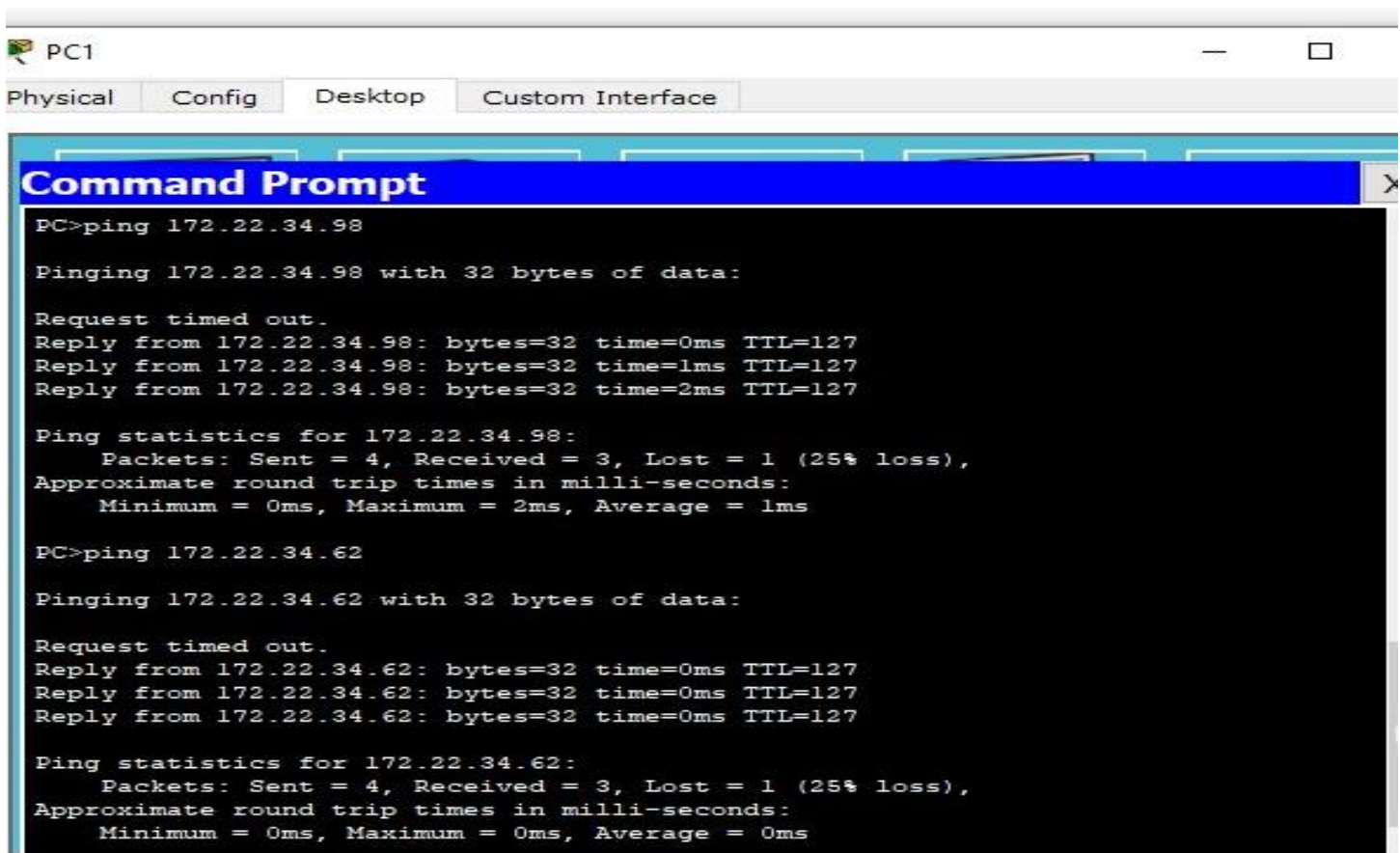


The screenshot shows the 'PC1' configuration window with the 'IP Configuration' dialog open. The 'Static' radio button is selected for IP configuration. The fields are filled with the following values:

Field	Value
IP Address	172.22.34.66
Subnet Mask	255.255.255.224
Default Gateway	172.22.34.65
DNS Server	

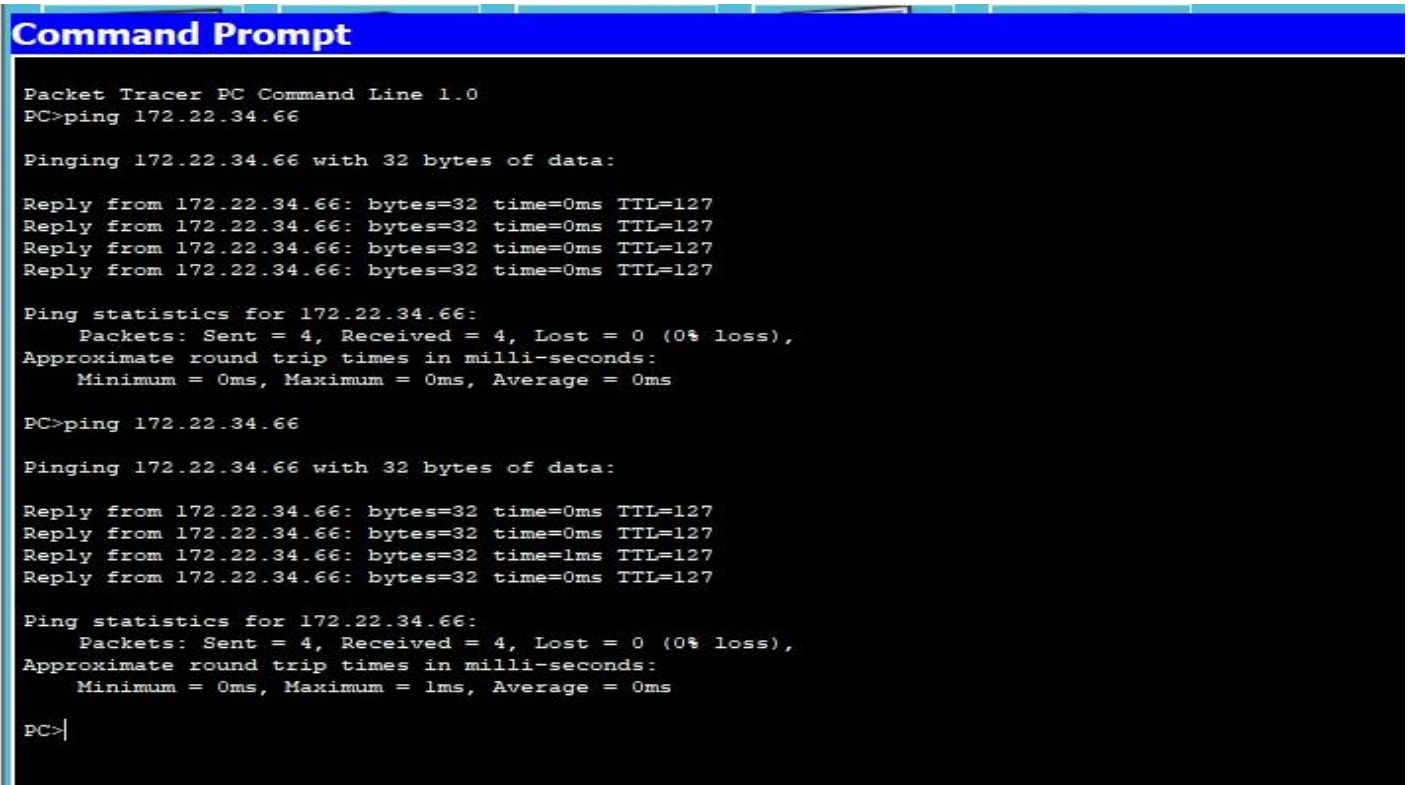


➤ Performing Ping from PC1 to Server and PC2



Date : 24/01/2024
Practical No : 3A

➤ Performing Ping from PC2 to Server and PC1

A screenshot of a Packet Tracer PC Command Line window. The window has a blue title bar that says "Command Prompt". The background is black with white text. The text shows a series of commands and their outputs. First, the user enters "PC>ping 172.22.34.66". The output shows four successful replies from 172.22.34.66, each with 32 bytes, 0ms time, and TTL=127. Then, the user enters "PC>ping 172.22.34.66" again. The output shows four replies, with the third one taking 1ms. Ping statistics for both commands show 4 packets sent, 4 received, 0% loss, and an average time of 0ms.

```
Packet Tracer PC Command Line 1.0
PC>ping 172.22.34.66

Pinging 172.22.34.66 with 32 bytes of data:

Reply from 172.22.34.66: bytes=32 time=0ms TTL=127
Reply from 172.22.34.66: bytes=32 time=0ms TTL=127
Reply from 172.22.34.66: bytes=32 time=0ms TTL=127
Reply from 172.22.34.66: bytes=32 time=0ms TTL=127

Ping statistics for 172.22.34.66:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 172.22.34.66

Pinging 172.22.34.66 with 32 bytes of data:

Reply from 172.22.34.66: bytes=32 time=0ms TTL=127
Reply from 172.22.34.66: bytes=32 time=0ms TTL=127
Reply from 172.22.34.66: bytes=32 time=1ms TTL=127
Reply from 172.22.34.66: bytes=32 time=0ms TTL=127

Ping statistics for 172.22.34.66:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>|
```

Date : 24/01/2024
Practical No : 3A

➤ **Configure, Apply and Verify an Extended Numbered ACL**

(PC1 needs only FTP access and should be able to ping the server, but not PC2)

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip access-list ?
    extended  Extended Access List
    standard  Standard Access List
Router(config)#ip access-list extended ?
    <100-199>  Extended IP access-list number
WORD         name
Router(config)#ip access-list extended HTTP-ACL
Router(config-ext-nacl)#permit tcp 172.22.34.96 ?
    A.B.C.D    Source wildcard bits
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 ?
    A.B.C.D    Destination address
    any        Any destination host
    eq         Match only packets on a given port number
    gt         Match only packets with a greater port number
    host       A single destination host
    lt         Match only packets with a lower port number
    neq        Match only packets not on a given port number
    range      Match only packets in the range of port numbers
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host ?
    A.B.C.D    Destination address
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host 172.22.34.62 ?
    eq         Match only packets on a given port number
    established established
    gt         Match only packets with a greater port number
    lt         Match only packets with a lower port number
    neq        Match only packets not on a given port number
    range      Match only packets in the range of port numbers
<cr>
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host 172.22.34.62 eq ?
    <0-65535>  Port number
    domain     Domain Name Service (DNS, 53)
    ftp        File Transfer Protocol (21)
    pop3       Post Office Protocol v3 (110)
    smtp       Simple Mail Transport Protocol (25)
    telnet     Telnet (23)
    www        World Wide Web (HTTP, 80)
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host 172.22.34.62 eq ww
w
```


Date : 24/01/2024
Practical No : 3A

```
Router(config-ext-nacl)#permit icmp 172.22.34.96 0.0.0.15 host 172.22.34.62
Router(config-ext-nacl)#interface GigabitEthernet0/1
Router(config-if)#ip access-group HTTP_ACL in
Router(config-if)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

- Performing Ping from PC1 to Server and PC2 to check the working of ACL

PC1

Physical Config Desktop Custom Interface

Command Prompt

```
Packet Tracer PC Command Line 1.0
PC>ftp 172.22.34.62
Trying to connect...172.22.34.62
Connected to 172.22.34.62
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
%Error ftp://172.22.34.62/ (No such Account)
332- Need account for login

Packet Tracer PC Command Line 1.0
PC>ftp 172.22.34.62
Trying to connect...172.22.34.62
Connected to 172.22.34.62
220- Welcome to PT Ftp server
Username:cisco
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>quit

Packet Tracer PC Command Line 1.0
PC>221- Service closing control connection.
PC>ping 172.22.34.98

Pinging 172.22.34.98 with 32 bytes of data:

Reply from 172.22.34.65: Destination host unreachable.
Reply from 172.22.34.65: Destination host unreachable.
Reply from 172.22.34.65: Destination host unreachable.
Reply from 172.22.34.65: Destination host unreachable.

Ping statistics for 172.22.34.98:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

➤ **Configure, Apply and Verify an Extended Numbered ACL**

(PC2 needs only web access and should be able to ping the server, but not PC1)

Date : 24/01/2024
Practical No : 3A

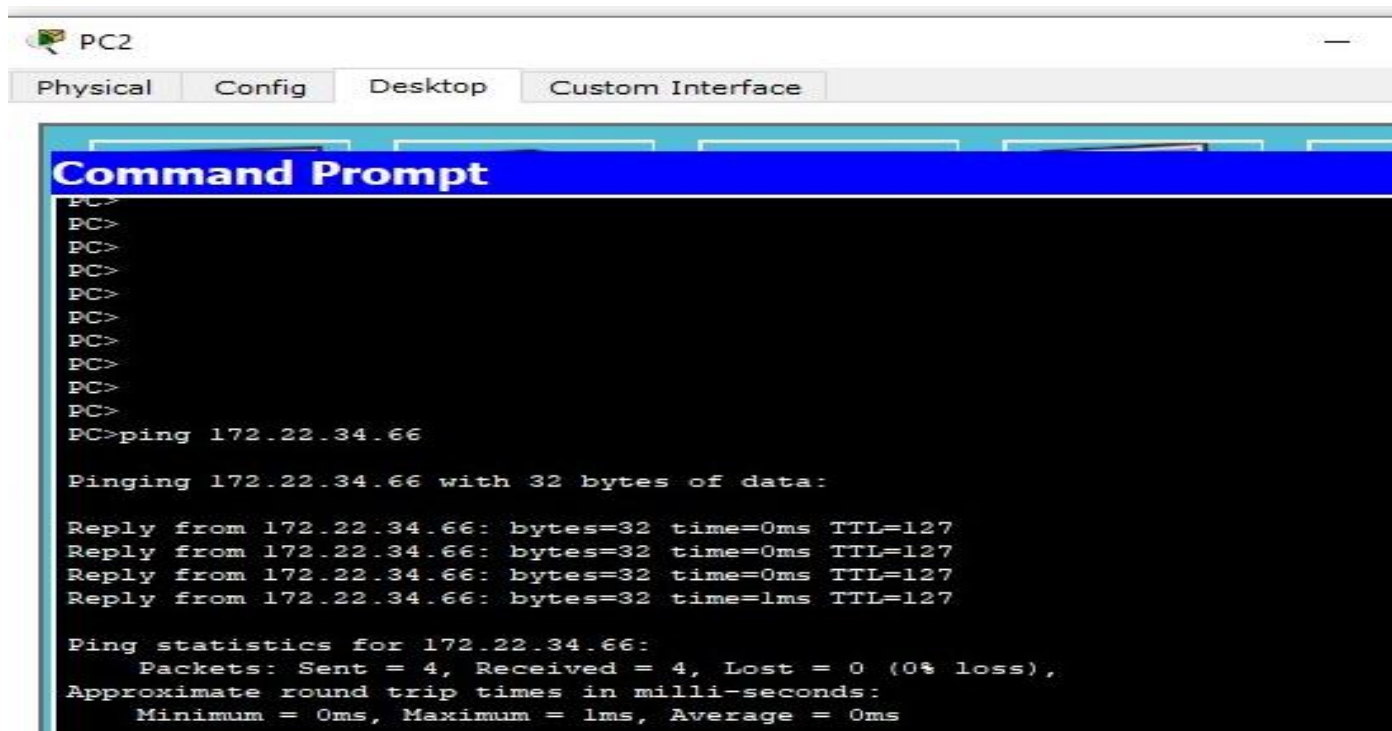
```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip access-list ?
    extended  Extended Access List
    standard  Standard Access List
Router(config)#ip access-list extended ?
<100-199>  Extended IP access-list number
WORD      name
Router(config)#ip access-list extended HTTP-ACL
Router(config-ext-nacl)#permit tcp 172.22.34.96 ?
    A.B.C.D  Source wildcard bits
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 ?
    A.B.C.D  Destination address
    any      Any destination host
    eq       Match only packets on a given port number
    gt       Match only packets with a greater port number
    host     A single destination host
    lt       Match only packets with a lower port number
    neq      Match only packets not on a given port number
    range    Match only packets in the range of port numbers
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host ?
    A.B.C.D  Destination address
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host 172.22.34.62 ?
    eq       Match only packets on a given port number
    established  established
    gt       Match only packets with a greater port number
    lt       Match only packets with a lower port number
    neq      Match only packets not on a given port number
    range    Match only packets in the range of port numbers
<cr>
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host 172.22.34.62 eq ?
<0-65535>  Port number
    domain   Domain Name Service (DNS, 53)
    ftp      File Transfer Protocol (21)
    pop3     Post Office Protocol v3 (110)
    smtp     Simple Mail Transport Protocol (25)
    telnet   Telnet (23)
    www      World Wide Web (HTTP, 80)
Router(config-ext-nacl)#permit tcp 172.22.34.96 0.0.0.15 host 172.22.34.62 eq ww
w
```

```
Router(config-ext-nacl)#permit icmp 172.22.34.96 0.0.0.15 host 172.22.34.62
Router(config-ext-nacl)#interface GigabitEthernet0/1
Router(config-if)#ip access-group HTTP_ACL in
Router(config-if)#^Z
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

➤ Performing Ping from PC2 to Server and PC1 to check the working of ACL

Date : 24/01/2024
Practical No : 3A

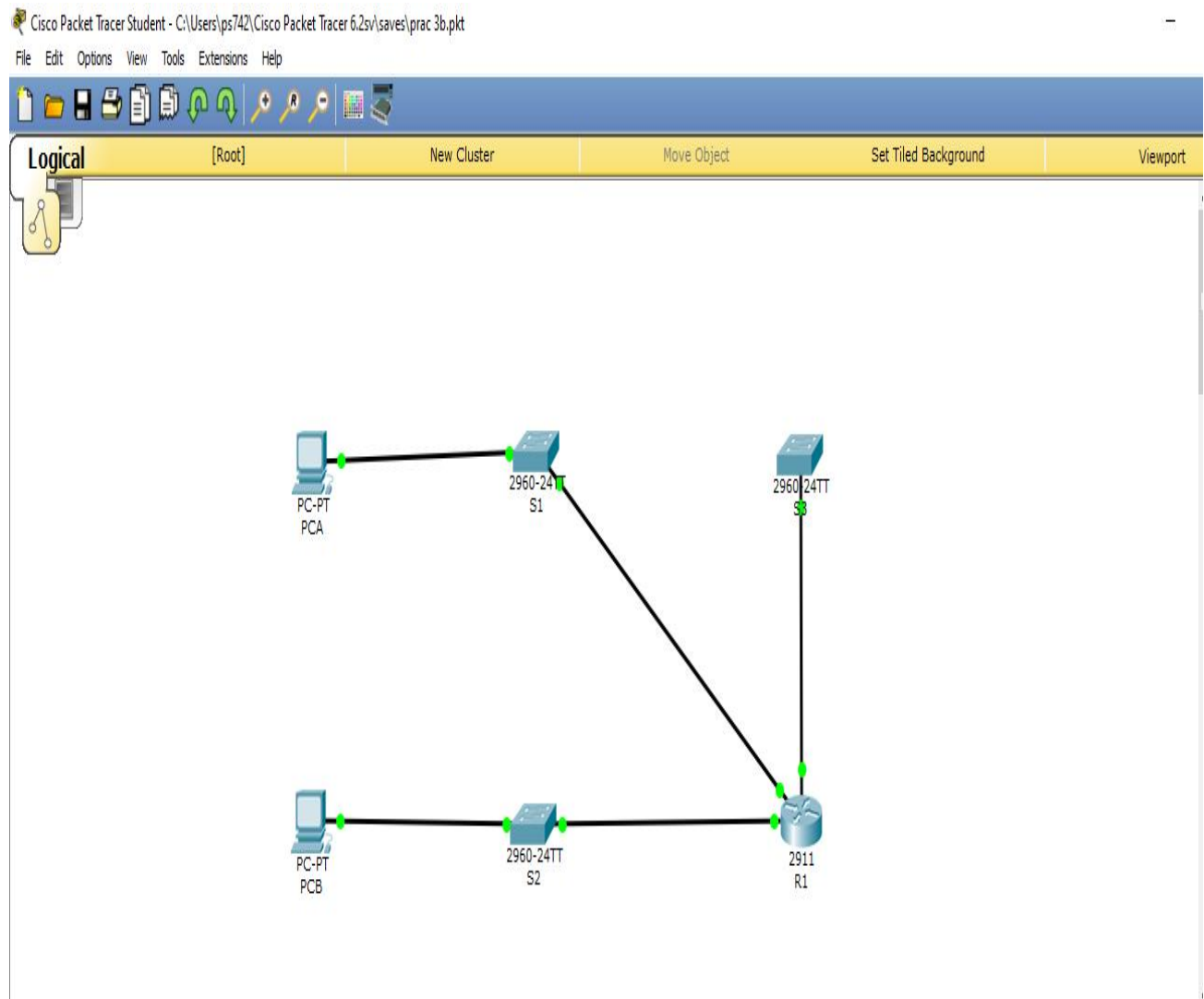
◆ Checking http connection from PC2



Date : 24/01/2024
Practical No : 3B

- **Aim :- Configure, Apply and Verify an Extended Numbered ACL**

➤ **Topology Diagram**



Date : 24/01/2024
Practical No : 3B

➤ Assign IP Addresses

PCA

Physical Config Desktop Custom Interface

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IP Address: 10.101.117.51

Subnet Mask: 255.255.255.248

Default Gateway: 10.101.117.49

DNS Server: 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address: /

Link Local Address: FE80::202:4AFF:FE56:B781

IPv6 Gateway:

IPv6 DNS Server:

PCB

Physical Config Desktop Custom Interface

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IP Address: 10.101.117.35

Subnet Mask: 255.255.255.240

Default Gateway: 10.101.117.33

DNS Server: 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

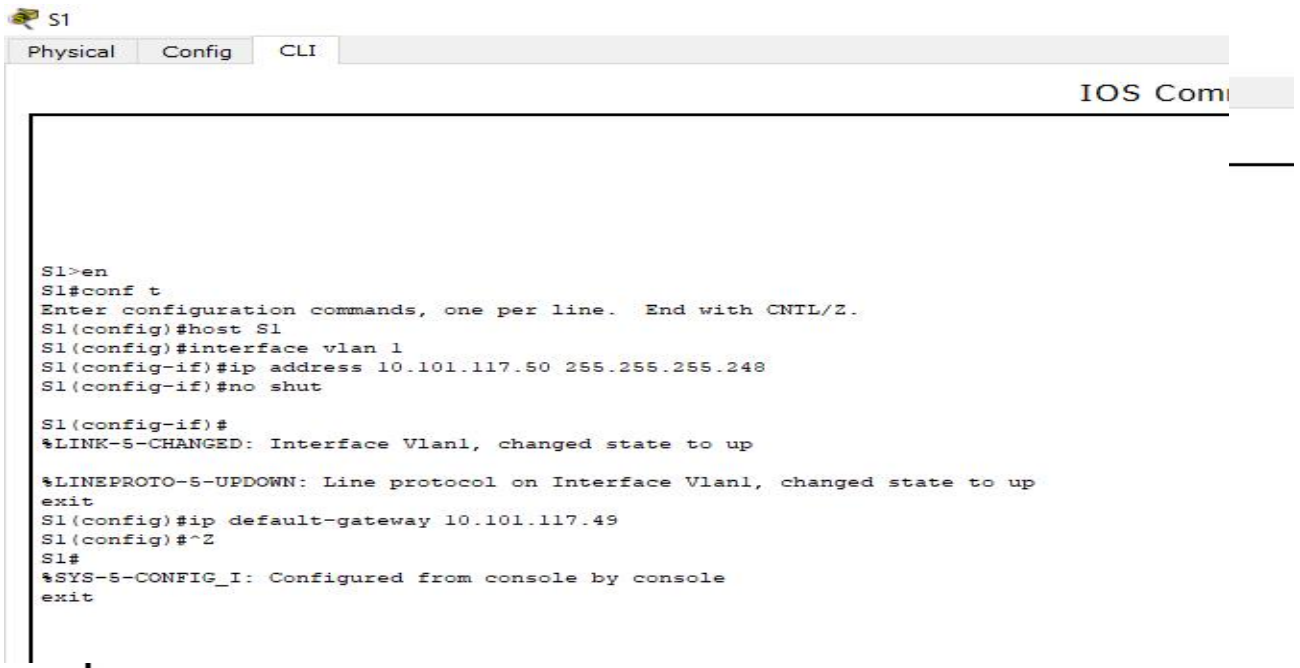
IPv6 Address: /

Link Local Address: FE80::201:64FF:FE98:B13D

IPv6 Gateway:

IPv6 DNS Server:

Date : 24/01/2024
Practical No : 3B

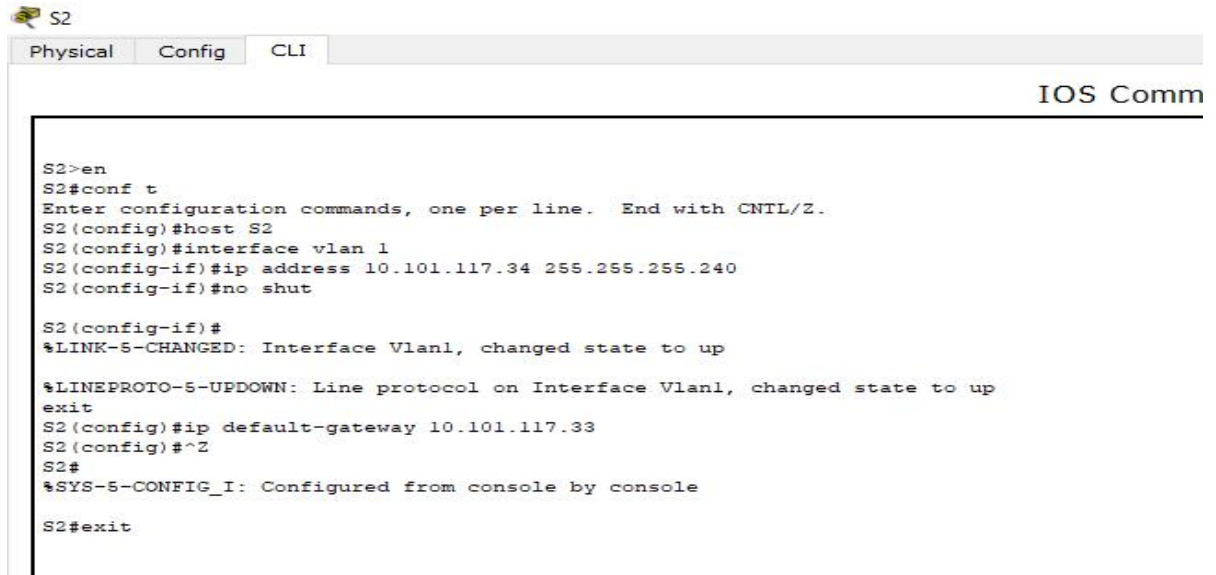


```
S1>en
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#host S1
S1(config)#interface vlan 1
S1(config-if)#ip address 10.101.117.50 255.255.255.248
S1(config-if)#no shut

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
S1(config)#ip default-gateway 10.101.117.49
S1(config)#^Z
S1#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

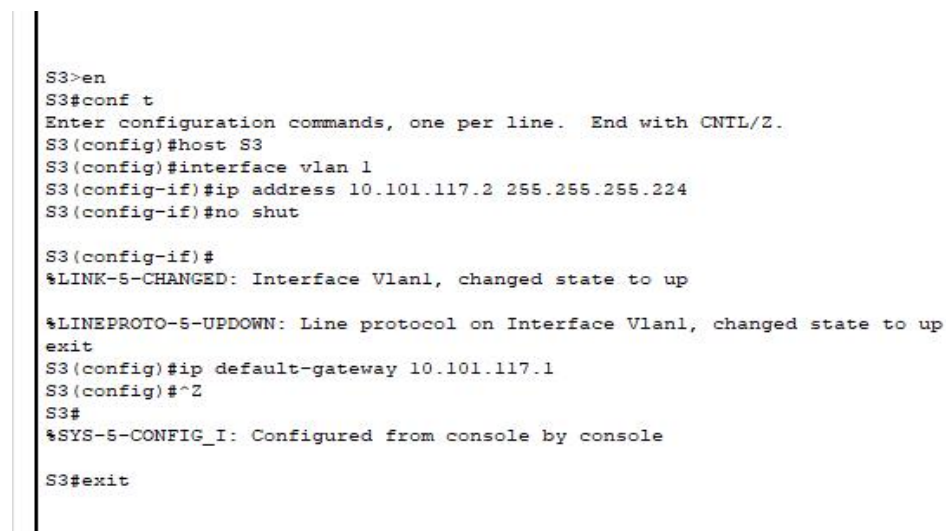
Date : 24/01/2024
Practical No : 3B



```
S2>en
S2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#host S2
S2(config)#interface vlan 1
S2(config-if)#ip address 10.101.117.34 255.255.255.240
S2(config-if)#no shut

S2(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
S2(config)#ip default-gateway 10.101.117.33
S2(config)#^Z
S2#
%SYS-5-CONFIG_I: Configured from console by console
S2#exit
```



```
S3>en
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#host S3
S3(config)#interface vlan 1
S3(config-if)#ip address 10.101.117.2 255.255.255.224
S3(config-if)#no shut

S3(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
S3(config)#ip default-gateway 10.101.117.1
S3(config)#^Z
S3#
%SYS-5-CONFIG_I: Configured from console by console
S3#exit
```

Date : 24/01/2024
Practical No : 3B

➤ **Displaying IP Addresses Details**

```
R1>show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	10.101.117.49	YES	manual	up	up
GigabitEthernet0/1	10.101.117.33	YES	manual	up	up
GigabitEthernet0/2	10.101.117.1	YES	manual	up	up

➤ **Configuring Telnet on S3**

```
S3>en
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#username admin password teacher
S3(config)#line vty 0 4
S3(config-line)#login local
S3(config-line)#^Z
S3#
%SYS-5-CONFIG_I: Configured from console by console
exit
```


Date : 24/01/2024
Practical No : 3B

◆ **Configure, Apply and Verify an Extended Numbered ACL**

(Devices on LAN 10.101.117.32 are allowed to remotely access devices in LAN 10.101.117.0 using the TELNET protocol. Besides ICMP, all traffic from other networks is denied.)



```
R1
Physical Config CLI
IOS Comm

R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#access-list ?
  <1-99>      IP standard access list
  <100-199>   IP extended access list
R1(config)#access-list 199 ?
  deny        Specify packets to reject
  permit      Specify packets to forward
  remark      Access list entry comment
R1(config)#access-list 199 permit ?
  ahp         Authentication Header Protocol
  eigrp       Cisco's EIGRP routing protocol
  esp         Encapsulation Security Payload
  gre         Cisco's GRE tunneling
  icmp        Internet Control Message Protocol
  ip          Any Internet Protocol
  ospf        OSPF routing protocol
  tcp         Transmission Control Protocol
  udp         User Datagram Protocol
R1(config)#access-list 199 permit tcp ?
  A.B.C.D     Source address
  any         Any source host
  host        A single source host
R1(config)#access-list 199 permit tcp 10.101.117.32 0.0.0.15 ?
  A.B.C.D     Destination address
  any         Any destination host
  eq          Match only packets on a given port number
  gt          Match only packets with a greater port number
  host        A single destination host
  lt          Match only packets with a lower port number
  neq         Match only packets not on a given port number
  range       Match only packets in the range of port numbers
R1(config)#access-list 199 permit tcp 10.101.117.32 0.0.0.15 10.101.117.0 ?
  A.B.C.D     Destination wildcard bits
R1(config)#access-list 199 permit tcp 10.101.117.32 0.0.0.15 10.101.117.0 0.0.0.31 ?
  dscp        Match packets with given dscp value
  eq          Match only packets on a given port number
  established  established
  gt          Match only packets with a greater port number
```

Date : 24/01/2024

Practical No : 3B

```
R1
Physical Config CLI
IOS Command |
R1(config)#access-list 199 permit tcp 10.101.117.32 0.0.0.15 10.101.117.0 0.0.0.31 eq ?
<0-65535> Port number
ftp File Transfer Protocol (21)
pop3 Post Office Protocol v3 (110)
smtp Simple Mail Transport Protocol (25)
telnet Telnet (23)
www World Wide Web (HTTP, 80)
R1(config)#access-list 199 permit tcp 10.101.117.32 0.0.0.15 10.101.117.0 0.0.0.31 eq telnet
R1(config)#access-list 199 ?
deny Specify packets to reject
permit Specify packets to forward
remark Access list entry comment
R1(config)#access-list 199 permit ?
ahp Authentication Header Protocol
eigrp Cisco's EIGRP routing protocol
esp Encapsulation Security Payload
gre Cisco's GRE tunneling
icmp Internet Control Message Protocol
ip Any Internet Protocol
ospf OSPF routing protocol
tcp Transmission Control Protocol
udp User Datagram Protocol
R1(config)#access-list 199 permit icmp ?
A.B.C.D Source address
any Any source host
host A single source host
R1(config)#access-list 199 permit icmp any ?
A.B.C.D Destination address
any Any destination host
host A single destination host
R1(config)#access-list 199 permit icmp any any
R1(config)#interface GigabitEthernet0/2
R1(config-if)#ip access-group 199 out
R1(config-if)#^Z
R1#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

◆ Verify the extended ACL implementation

PC-B

```
PC>ping 10.101.117.51

Pinging 10.101.117.51 with 32 bytes of data:

Reply from 10.101.117.51: bytes=32 time=0ms TTL=127
Reply from 10.101.117.51: bytes=32 time=0ms TTL=127
Reply from 10.101.117.51: bytes=32 time=20ms TTL=127
Reply from 10.101.117.51: bytes=32 time=0ms TTL=127

Ping statistics for 10.101.117.51:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 20ms, Average = 5ms

PC>telnet 10.101.117.2
Trying 10.101.117.2 ...Open

User Access Verification

Username: admin
Password:
S3>
```

Date : 24/01/2024
Practical No : 3B

PC-A

```
PC>ping 10.101.117.35

Pinging 10.101.117.35 with 32 bytes of data:

Reply from 10.101.117.35: bytes=32 time=1ms TTL=127
Reply from 10.101.117.35: bytes=32 time=3ms TTL=127
Reply from 10.101.117.35: bytes=32 time=10ms TTL=127
Reply from 10.101.117.35: bytes=32 time=0ms TTL=127

Ping statistics for 10.101.117.35:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 3ms

PC>telnet 10.101.117.2
Trying 10.101.117.2 ...
% Connection timed out; remote host not responding
PC>
```