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PRUEBA DE HABILIDADES PRÁCTICAS

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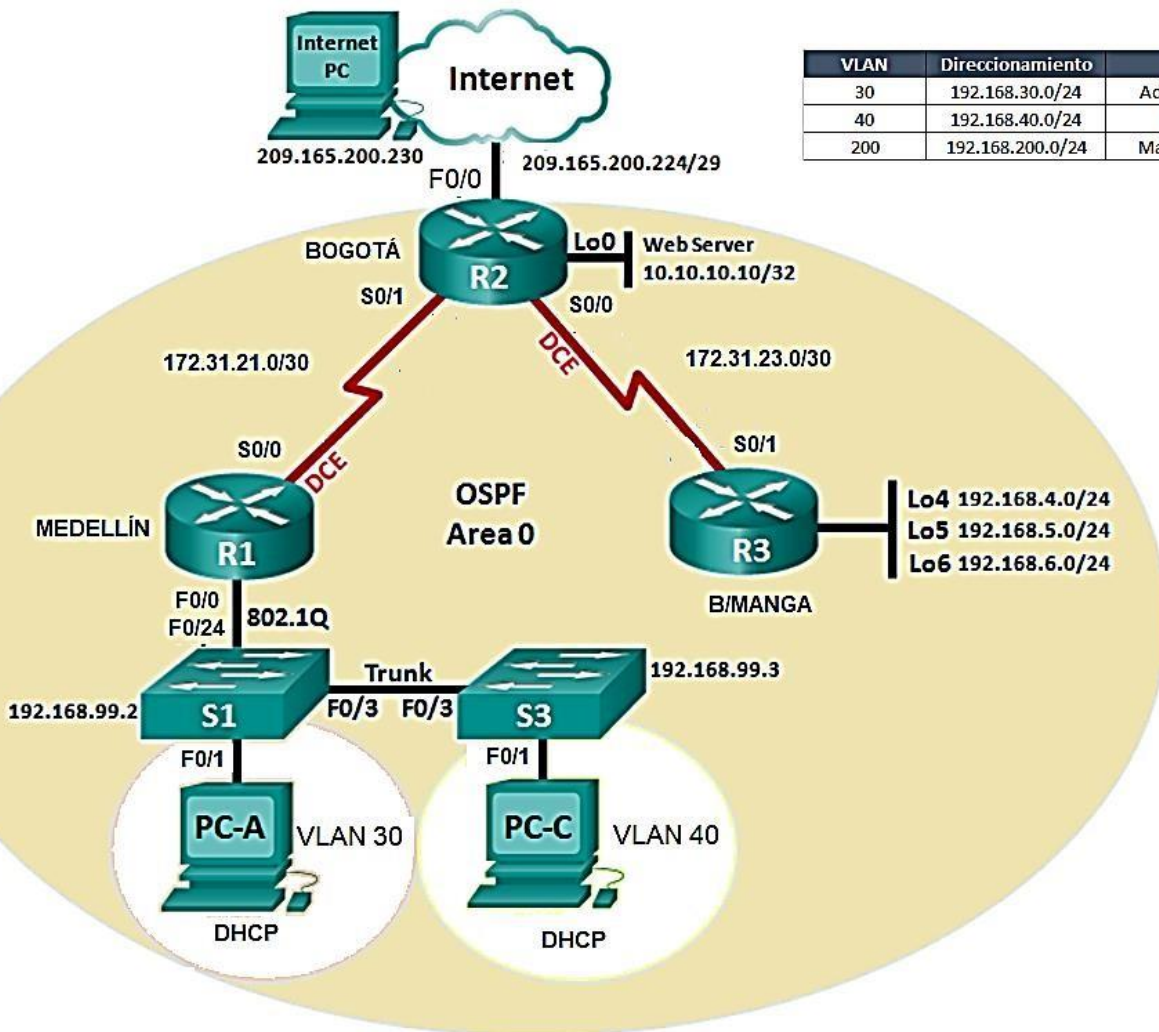
**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA
ESCUELA DE CIENCIAS BASICAS TECNOLOGIA E INGENIERIA**

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Descripción del escenario propuesto para la prueba de habilidades

Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.

Topología de red





1. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

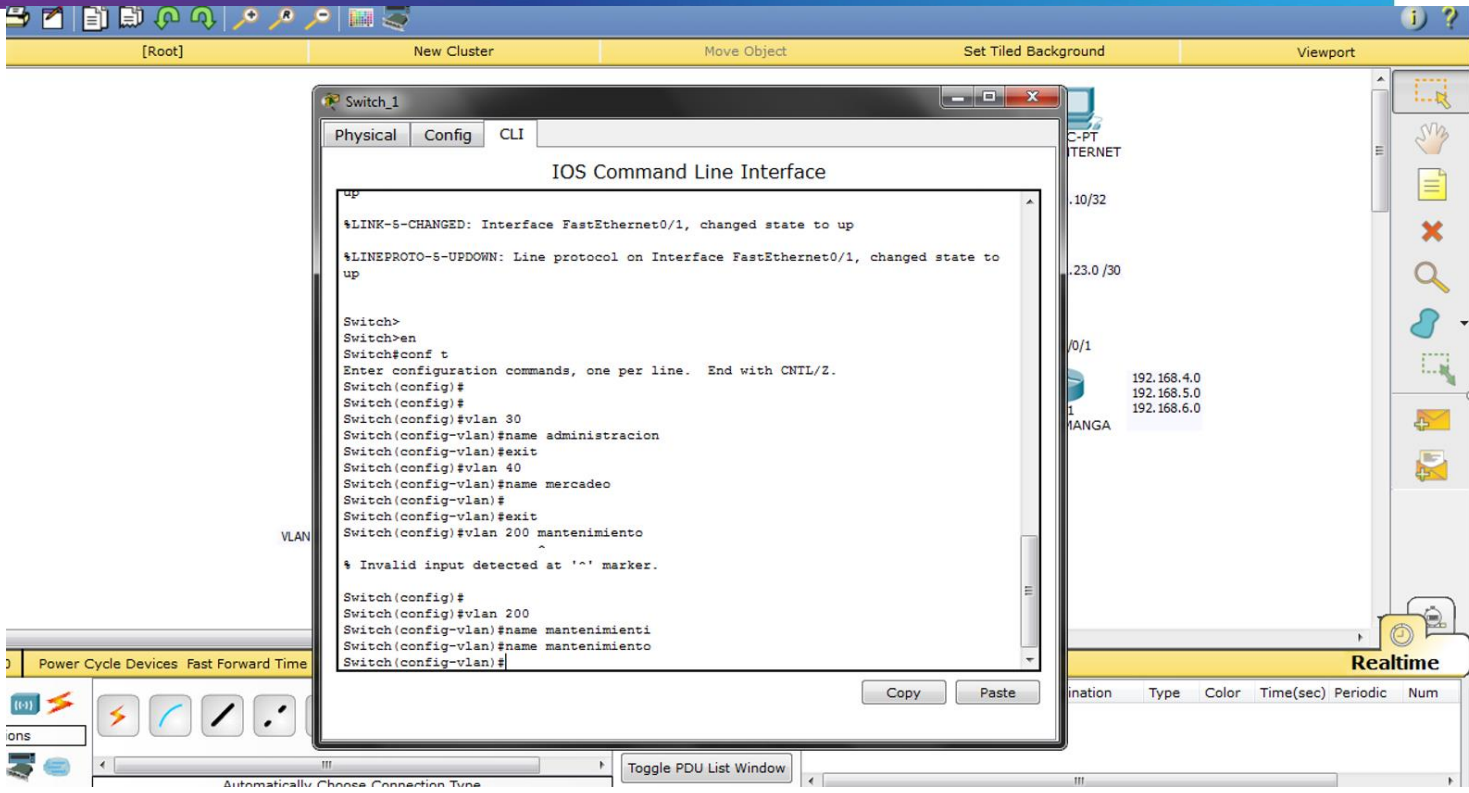
OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	2.2.2.2
Router ID R3	3.3.3.3
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	128 Kb/s
Ajustar el costo en la métrica de S0/0 a	7500

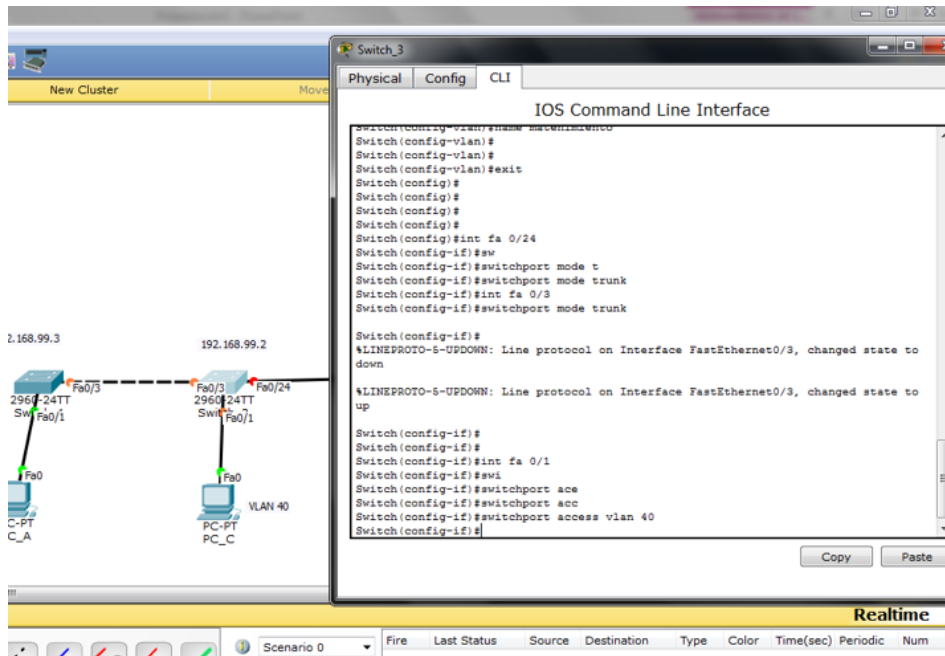
Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2
- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface
- Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

```
.
router ospf 1
  router-id 1.1.1.1
  log-adjacency-changes
  network 172.31.21.0 0.0.0.3 area 0
  network 192.168.30.0 0.0.0.255 area 0
  network 192.168.40.0 0.0.0.255 area 0
  network 192.168.200.0 0.0.0.255 area 0
!
ip classless
!
ip flow-export version 9
!
!
access-list 2 deny 192.168.40.0 0.0.0.255
access-list 2 permit any
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
  login
.
```

3. En el Switch 3 deshabilitar DNS lookup



4. Asignar direcciones IP a los Switches acorde a los lineamientos.

```

IOS Command Line Interface

%LINK-3-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0 from LOADING to FULL, Loading Done

MEDELLIN>
MEDELLIN>en
MEDELLIN#sh
MEDELLIN#show acc
MEDELLIN#show access-lists
Standard IP access list 2
 10 deny 192.168.40.0 0.0.0.255
 20 permit any
MEDELLIN#
MEDELLIN#
    
```

```

BUCARAMANGA (config)#
BUCARAMANGA (config)#inter
BUCARAMANGA (config)#interface vlan 201
BUCARAMANGA (config-if)#
BUCARAMANGA (config-if)#
BUCARAMANGA (config-if)#ip ad
BUCARAMANGA (config-if)#ip address 10.3.3
                                     ^
% Invalid input detected at '^' marker.

BUCARAMANGA (config-if)#ip address 10.3.3.1
% Incomplete command.
BUCARAMANGA (config-if)#ip address 10.3.3.1 255.255.255.0
BUCARAMANGA (config-if)#
    
```

5. Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

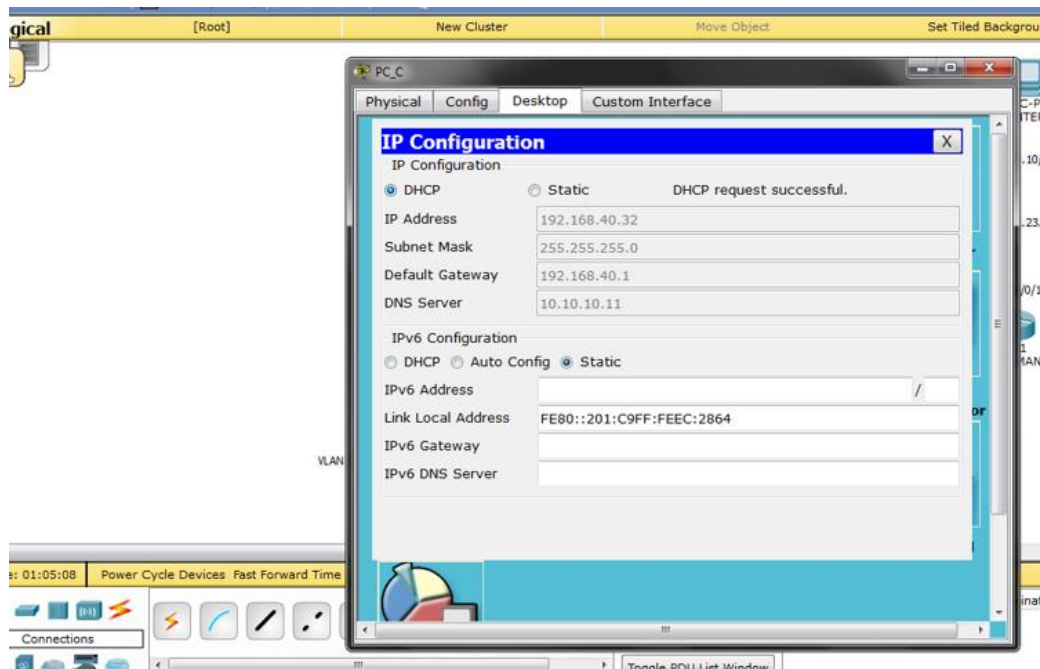
The screenshot shows the Cisco Packet Tracer interface. On the left, the 'CLI' window for the 'MEDELLIN' router is open, displaying the following configuration commands:

```

MEDELLIN (config)#ip 0
MEDELLIN (config)#ip dd
MEDELLIN (config)#ip dh
MEDELLIN (config)#ip dhcp e
MEDELLIN (config)#ip dhcp excluded-address 192.168.30.1
% Invalid input detected at '^' marker.
MEDELLIN (config)#ip dhcp excluded-address 192.168.30.1
MEDELLIN (config)#ip dhcp excluded-address 192.168.40.1
MEDELLIN (config)#ip dhcp excluded-address 192.168.200.1
MEDELLIN (config)#ip dhcp excluded-address ?
A.B.C.D Low IP address
MEDELLIN (config)#ip dhcp excluded-address 192.168.30.1 ?
A.B.C.D High IP address
<cr>
MEDELLIN (config)#ip dhcp excluded-address 192.168.30.1 192.168.30.31
MEDELLIN (config)#ip dhcp excluded-address 192.168.40.1 192.168.40.31
MEDELLIN (config)#ip dh
MEDELLIN (config)#ip dhcp po
MEDELLIN (config)#ip dhcp pool MERCADERO
MEDELLIN (dhcp-config)#
MEDELLIN (dhcp-config)#net
MEDELLIN (dhcp-config)#network 192.168.40.0 255.255.255.0
MEDELLIN (dhcp-config)#e
MEDELLIN (dhcp-config)#default-router 192.168.40.1
MEDELLIN (dhcp-config)#dns
MEDELLIN (dhcp-config)#DNS-server 10.10.10.11
MEDELLIN (dhcp-config)#
    
```

On the right, the network diagram shows three routers: MEDELLIN (2901), BOGOTÁ (2901), and BUCARAMANGA (2901). MEDELLIN is connected to BOGOTÁ via GigabitEthernet0/24 and Serial0/0/0. BOGOTÁ is connected to BUCARAMANGA via Serial0/0/1. A PC-PT labeled 'PC INTERNET' is connected to BOGOTÁ via Fa0/20. IP addresses and subnet masks are shown for various interfaces: BOGOTÁ (209.165.200.224/29), MEDELLIN (172.31.21.0/30), BUCARAMANGA (172.31.23.0/30), and PC INTERNET (10.10.10.10/32). The BUCARAMANGA router has three interfaces with IP addresses 192.168.4.0, 192.168.5.0, and 192.168.6.0.

6. Implement DHCP and NAT for IPv4



7. Configurar R1 como servidor DHCP para las VLANs 30 y 40.

```

MEDELLIN
Physical Config CLI
IOS Command Line Interface
Router Configuration Commands, one per line. End with Ctrl-Z.
Router(config)#hos
Router(config)#hos
Router(config)#hostname MEDELLIN
MEDELLIN(config)#
MEDELLIN(config)#int se 0/0/0
MEDELLIN(config-if)#ip add 172.31.21.2 255.255.255.252
MEDELLIN(config-if)#no sh

MEDELLIN(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
MEDELLIN(config-if)#int gi 0/0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
MEDELLIN(config-if)#exit
MEDELLIN(config)#int gi 0/0.30
MEDELLIN(config-subif)#en
MEDELLIN(config-subif)#encapsulation dot1Q 30
MEDELLIN(config-subif)#ip add 192.168.30.1 255.255.255.0
MEDELLIN(config-subif)#exit
MEDELLIN(config)#int gi 0/0.40
MEDELLIN(config-subif)#encapsulation dot1Q 40
MEDELLIN(config-subif)#ip add 192.168.40.1 255.255.255.0
MEDELLIN(config-subif)#exit
MEDELLIN(config)#int gi 0/0.200
MEDELLIN(config-subif)#encapsulation dot1Q 200
MEDELLIN(config-subif)#ip add 192.168.200.1 255.255.255.0
MEDELLIN(config-subif)#
  
```

VLAN	Direccionamiento	Nombre
30	192.168.30.0/24	Administrac
40	192.168.40.0/24	Mercadec
200	192.168.200.0/24	Mantenimie

8. Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.



Configurar DHCP pool para VLAN 30

Name: ADMINISTRACION
DNS-Server: 10.10.10.11
Domain-Name: ccna-unad.com
Establecer default gateway.



Configurar DHCP pool para VLAN 40

Name: MERCADEO
DNS-Server: 10.10.10.11
Domain-Name: ccna-unad.com
Establecer default gateway.

```
no service password-encryption
!
hostname MEDELLIN
!
!
!
!
ip dhcp excluded-address 192.168.30.1
ip dhcp excluded-address 192.168.40.1
ip dhcp excluded-address 192.168.200.1
ip dhcp excluded-address 192.168.30.1 192.168.30.31
ip dhcp excluded-address 192.168.40.1 192.168.40.31
!
ip dhcp pool ADMINISTRACION
network 192.168.30.0 255.255.255.0
default-router 192.168.30.1
dns-server 10.10.10.11
ip dhcp pool MERCADEO
network 192.168.40.0 255.255.255.0
default-router 192.168.40.1
dns-server 10.10.10.11
!
!
!
no ip cef
```

9. Configurar NAT en R2 para permitir que los host puedan salir a internet

```
!
router ospf 1
router-id 2.2.2.2
log-adjacency-changes
network 172.31.21.0 0.0.0.3 area 0
network 172.31.23.0 0.0.0.3 area 0
network 10.10.10.10 0.0.0.0 area 0
network 209.165.200.224 0.0.0.7 area 0
!
ip nat inside source list 10 interface GigabitEthernet0/0 overload
ip classless
!
ip flow-export version 9
!
!
access-list 10 permit 192.168.0.0 0.0.255.255
!
!
!
```

10. Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```

IOS Command Line Interface
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.30, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.40, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0.200, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0 from LOADING to FULL, Loading Done

MEDELLIN>
MEDELLIN>en
MEDELLIN#sh
MEDELLIN#show acc
MEDELLIN#show access-lists
Standard IP access list 2
 10 deny 192.168.40.0 0.0.0.255
 20 permit any
MEDELLIN#
MEDELLIN#
    
```

11. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```

BUCARAMANGA
Physical Config CLI
IOS Command Line Interface
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
256K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

Press RETURN to get started!

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from LOADING to FULL, Loading Done

BUCARAMANGA>
BUCARAMANGA>en
BUCARAMANGA#
BUCARAMANGA#sh
BUCARAMANGA#show acc
BUCARAMANGA#show access-lists
Extended IP access list 100
 10 permit ip 192.168.4.0 0.0.0.255 host 10.10.10.10
 20 permit ip any any
Extended IP access list 101
 10 deny ip 192.168.5.0 0.0.0.255 209.165.200.224 0.0.0.7
 20 permit ip any any
BUCARAMANGA#
    
```

12. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

The diagram shows a network topology with two 2960-24TT switches (Switch_1 and Switch_3) connected to each other and to a PC-PT/PC-C (VLAN 40). Switch_1 has IP 192.168.99.3. The PC-PT/PC-C has IP 192.168.30.32. A PC INTERNET window is open, showing a Command Prompt with the following output:

```

209.165.200.224 /29
PC INTERNET
Physical Config Desktop Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 192.168.30.32

Pinging 192.168.30.32 with 32 bytes of data:

Reply from 209.165.200.225: bytes=32 time=15ms TTL=126
Reply from 209.165.200.225: bytes=32 time=3ms TTL=126
Reply from 209.165.200.225: bytes=32 time=3ms TTL=126
Reply from 209.165.200.225: bytes=32 time=29ms TTL=126

Ping statistics for 192.168.30.32:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 29ms, Average = 12ms

PC>
  
```

The Packet Tracer Logical view shows a network diagram with PC-PT/PC-A (VLAN 30) connected to Switch_1 (192.168.99.1), which is connected to Switch_3 (192.168.99.2), and then to PC-PT/PC-C (VLAN 40). A PC INTERNET cloud is connected to Switch_3. The Ping List window shows the following data:

File	Last Status	Source	Destination	Type	Color	Time(ms)	Periodic	Num	Est	Delete
●	Successful	BUCA	192.168.30.32	ICMP		0.000	N	0	(448)	(delete)
●	Successful	BUCA	MEDELLIN	ICMP		0.000	N	1	(448)	(delete)

Time: 00:04:48 | Power Cycle Devices | Roll Forward Time | Scenario 1 | Toggle PDU List Window