Practica 6 – Final
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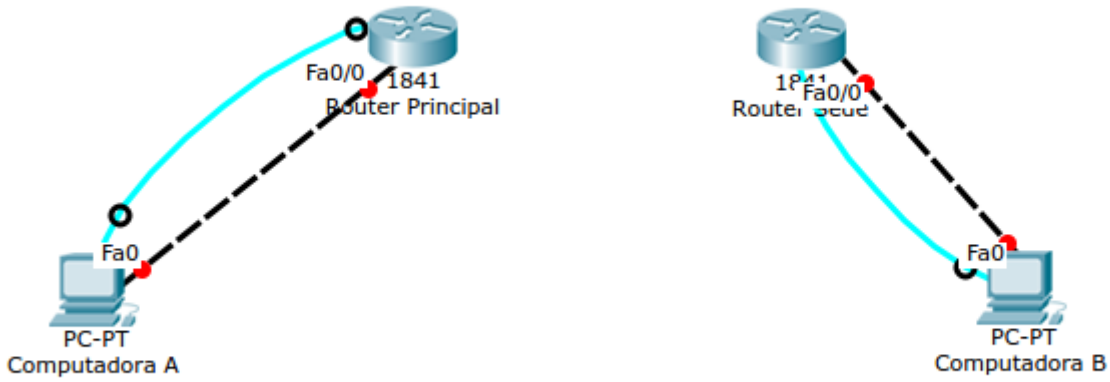
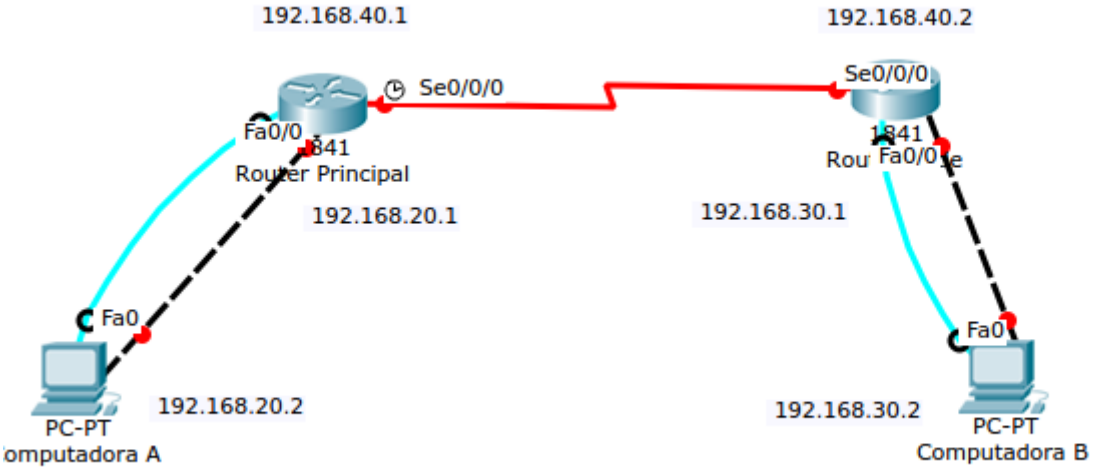
Actividades

5.1 Construir el escenario usando los routers indicados y las Pcs



5.2 Conectar los dos routers



5.3 Configuración

```
Router>enable
Router#confi
Router#configure te
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#inte
Router(config)#interface Fa
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.20.1 255.255.255.0
Router(config-if)#no sh
Router(config-if)#no shutdown
Router(config-if)#no shutdown

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)#
```

Configuracion Interface Ethernet del Router Principal

```
Router(config-if)#exit
Router(config)#inter
Router(config)#interface Se
Router(config)#interface Serial0/0/0
Router(config-if)#ip address 192.168.40.1 255.255.255.0
Router(config-if)#clock rate 128000
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Router(config-if)#
```

Coniguración Interface Serial del Router Principal

```
Router>enable
Router#confi
Router#configure te
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface F
Router(config)#interface FastEthernet
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.30.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#no shutdown

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)#
```

Configuración Interface Ethernet del Router Sede

```
Router(config)#interface Serial0/0/0
Router(config-if)#ip address 192.168.40.2 255.255.255.0
Router(config-if)#no shu
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#
```

Configuracion Interface Serial del Router Sede

```
C    192.168.20.0/24 is directly connected, FastEthernet0/0
C    192.168.40.0/24 is directly connected, Serial0/0/0
```

Show Ip route en Router Principal

```
C    192.168.30.0/24 is directly connected, FastEthernet0/0
C    192.168.40.0/24 is directly connected, Serial0/0/0
```

Show Ip route en Router Sede

```
Router(config)#ip route 192.168.30.0 255.255.255.0 192.168.40.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.20.0/24 is directly connected, FastEthernet0/0
S    192.168.30.0/24 [1/0] via 192.168.40.2
C    192.168.40.0/24 is directly connected, Serial0/0/0
Router#
```

Configuración de la ruta en Router Principal

```
Router(config)#ip route 192.168.20.0 255.255.255.0 192.168.40.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

S    192.168.20.0/24 [1/0] via 192.168.40.1
C    192.168.30.0/24 is directly connected, FastEthernet0/0
C    192.168.40.0/24 is directly connected, Serial0/0/0
Router#
```

Configuración de la ruta en Router Sede

En estas nuevas tablas se agraga la ruta añadida con el comando ip route. Tiene la etiquete S porque a sido añadida estáticamente. Se muestra la dirección de la red y por donde llegar.

```
Router(config)#interface Serial0/0/0
Router(config-if)#shut
Router(config-if)#shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to administratively down

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

Router(config-if)#encap
Router(config-if)#encapsulation ppp
Router(config-if)#no shu
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#
```

Configuracion del protocolo PPP

5.4 Pruebas

```
Principal#show interfaces
FastEthernet0/0 is up, line protocol is up (connected)
  Hardware is Lance, address is 0090.0c20.e201 (bia 0090.0c20.e201)
  Internet address is 192.168.20.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 2 bits/sec, 0 packets/sec
  5 minute output rate 1 bits/sec, 0 packets/sec
     3 packets input, 84 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     2 packets output, 56 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Interface Ethernet de Router Principal

```
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.168.40.1/24
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set, keepalive set (10 sec)
  LCP Open
  Open: IPCP, CDPCP
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 1158 kilobits/sec
  5 minute input rate 1 bits/sec, 0 packets/sec
  5 minute output rate 2 bits/sec, 0 packets/sec
     2 packets input, 56 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     3 packets output, 84 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

Interface Serial del Router Principal

```
FastEthernet0/0 is up, line protocol is up (connected)
  Hardware is Lance, address is 0001.9650.1801 (bia 0001.9650.1801)
  Internet address is 192.168.30.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last input 00:00:08, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 1 bits/sec, 0 packets/sec
  5 minute output rate 1 bits/sec, 0 packets/sec
     2 packets input, 56 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 input packets with dribble condition detected
     2 packets output, 56 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Interface Ethernet del Router Sede

```
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.168.40.2/24
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, loopback not set, keepalive set (10 sec)
  LCP Open
  Open: IPCP, CDPCP
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
     Conversations  0/0/256 (active/max active/max total)
     Reserved Conversations 0/0 (allocated/max allocated)
     Available Bandwidth 1158 kilobits/sec
  5 minute input rate 2 bits/sec, 0 packets/sec
  5 minute output rate 1 bits/sec, 0 packets/sec
     3 packets input, 84 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     2 packets output, 56 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

Interface Serial del Router Sede

```
Principal#ping 192.168.40.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/10/21 ms

Principal#ping 192.168.20.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Principal#ping 192.168.40.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/7/16 ms

Principal#ping 192.168.30.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/10 ms

Principal#
Principal#ping 192.168.30.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/16 ms

Principal#
```

Ping desde el Router Principal

```
Router#ping 192.168.40.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/17/35 ms

Router#ping 192.168.30.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/2 ms
```

```
Router#ping 192.168.40.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 9/12/18 ms

Router#ping 192.168.20.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 7/8/13 ms

Router#ping 192.168.30.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/2/9 ms

Router#
```

Pings desde Router Sede

```
PC>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time=0ms TTL=255
Reply from 192.168.20.1: bytes=32 time=0ms TTL=255
Reply from 192.168.20.1: bytes=32 time=0ms TTL=255
Reply from 192.168.20.1: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.40.1

Pinging 192.168.40.1 with 32 bytes of data:

Reply from 192.168.40.1: bytes=32 time=0ms TTL=255
Reply from 192.168.40.1: bytes=32 time=0ms TTL=255
Reply from 192.168.40.1: bytes=32 time=0ms TTL=255
Reply from 192.168.40.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.40.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```

```
PC>ping 192.168.40.2

Pinging 192.168.40.2 with 32 bytes of data:

Reply from 192.168.40.2: bytes=32 time=21ms TTL=254
Reply from 192.168.40.2: bytes=32 time=13ms TTL=254
Reply from 192.168.40.2: bytes=32 time=1ms TTL=254
Reply from 192.168.40.2: bytes=32 time=15ms TTL=254

Ping statistics for 192.168.40.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 21ms, Average = 12ms

PC>ping 192.168.30.1

Pinging 192.168.30.1 with 32 bytes of data:

Reply from 192.168.30.1: bytes=32 time=2ms TTL=254
Reply from 192.168.30.1: bytes=32 time=6ms TTL=254
Reply from 192.168.30.1: bytes=32 time=11ms TTL=254
Reply from 192.168.30.1: bytes=32 time=18ms TTL=254

Ping statistics for 192.168.30.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 18ms, Average = 9ms

PC>
```

```
PC>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time=15ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126
Reply from 192.168.30.2: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 15ms, Average = 5ms

PC>
```

Pings desde la computadora A

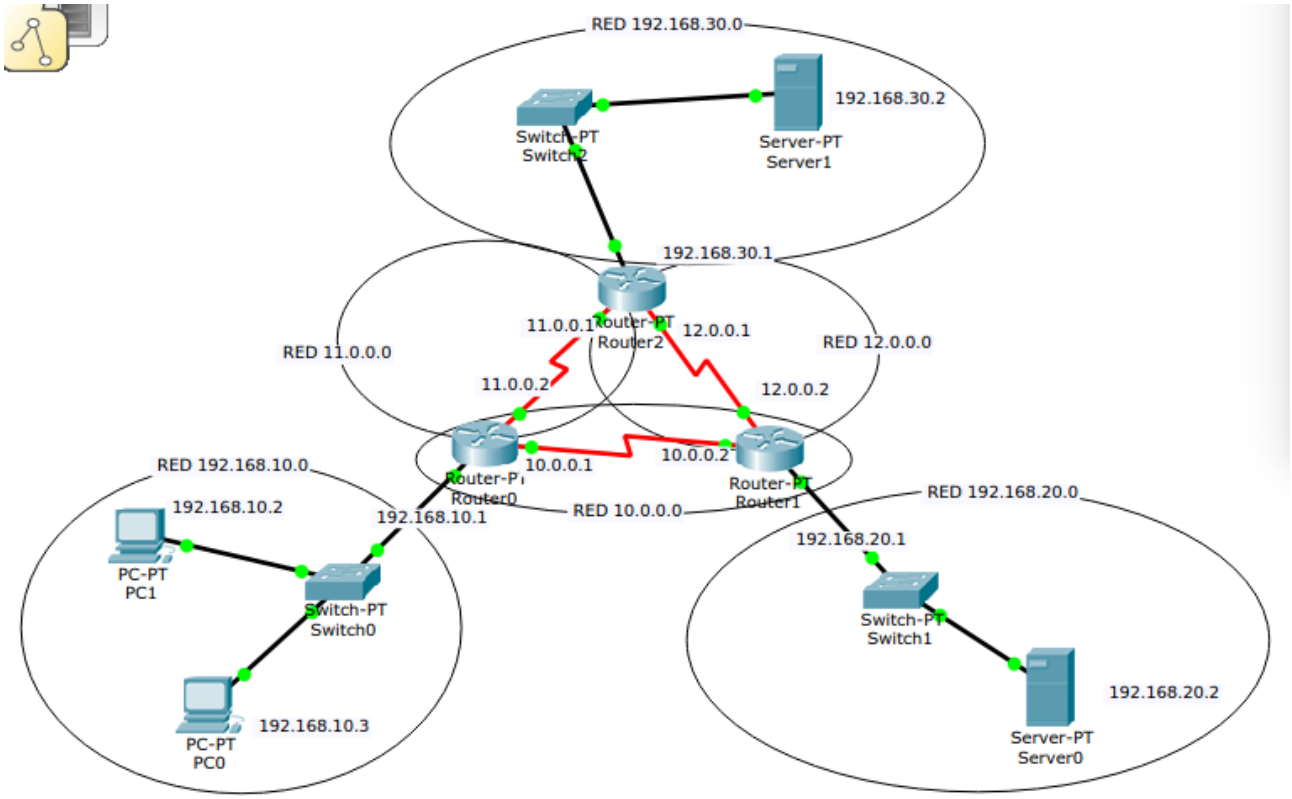
```
PC>ping 192.168.30.1

Pinging 192.168.30.1 with 32 bytes of data:

Reply from 192.168.30.1: bytes=32 time=0ms TTL=255
Reply from 192.168.30.1: bytes=32 time=1ms TTL=255
Reply from 192.168.30.1: bytes=32 time=0ms TTL=255
Reply from 192.168.30.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.30.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping 192.168.40.2

Pinging 192.168.40.2 with 32 bytes of data:

Reply from 192.168.40.2: bytes=32 time=1ms TTL=255
Reply from 192.168.40.2: bytes=32 time=0ms TTL=255
Reply from 192.168.40.2: bytes=32 time=0ms TTL=255
Reply from 192.168.40.2: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.40.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

```
PC>ping 192.168.40.1

Pinging 192.168.40.1 with 32 bytes of data:

Reply from 192.168.40.1: bytes=32 time=16ms TTL=254
Reply from 192.168.40.1: bytes=32 time=10ms TTL=254
Reply from 192.168.40.1: bytes=32 time=3ms TTL=254
Reply from 192.168.40.1: bytes=32 time=3ms TTL=254

Ping statistics for 192.168.40.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 16ms, Average = 8ms

PC>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time=1ms TTL=254
Reply from 192.168.20.1: bytes=32 time=6ms TTL=254
Reply from 192.168.20.1: bytes=32 time=3ms TTL=254
Reply from 192.168.20.1: bytes=32 time=13ms TTL=254

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 13ms, Average = 5ms

PC>
```

```
PC>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time=2ms TTL=126
Reply from 192.168.20.2: bytes=32 time=7ms TTL=126
Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 7ms, Average = 3ms

PC>
```

Pings desde la Computadora B

5.5 Construya el siguiente escenario, asegúrese de definir los Gateway apropiadamente en cada PC:



Estructura de la red

```
PC>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time=2ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

PC>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

PC>
```

```
PC>ping 11.0.0.1

Pinging 11.0.0.1 with 32 bytes of data:

Reply from 11.0.0.1: bytes=32 time=2ms TTL=254
Reply from 11.0.0.1: bytes=32 time=1ms TTL=254
Reply from 11.0.0.1: bytes=32 time=1ms TTL=254
Reply from 11.0.0.1: bytes=32 time=1ms TTL=254

Ping statistics for 11.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

PC>
```

Ping desde PC1 a Server1, Server2 y Router2

```
SERVER>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time=2ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

SERVER>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time=2ms TTL=126
Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=2ms TTL=126

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

SERVER>
```

```
SERVER>ping 11.0.0.2

Pinging 11.0.0.2 with 32 bytes of data:

Reply from 11.0.0.2: bytes=32 time=1ms TTL=254
Reply from 11.0.0.2: bytes=32 time=1ms TTL=254
Reply from 11.0.0.2: bytes=32 time=1ms TTL=254
Reply from 11.0.0.2: bytes=32 time=1ms TTL=254

Ping statistics for 11.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

SERVER>
```

Pings desde Server1 a PC1, Server1 y Router0

```
SERVER>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time=6ms TTL=126
Reply from 192.168.30.2: bytes=32 time=2ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126
Reply from 192.168.30.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 6ms, Average = 2ms

SERVER>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

SERVER>
```

```
SERVER>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Reply from 10.0.0.2: bytes=32 time=0ms TTL=255
Reply from 10.0.0.2: bytes=32 time=0ms TTL=255
Reply from 10.0.0.2: bytes=32 time=0ms TTL=255
Reply from 10.0.0.2: bytes=32 time=0ms TTL=255

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

SERVER>
```

Pings desde Server0 a Server1, PC1 y Router2

```
SERVER>ping 192.168.10.255

Pinging 192.168.10.255 with 32 bytes of data:

Reply from 11.0.0.2: bytes=32 time=11ms TTL=254
Reply from 11.0.0.2: bytes=32 time=1ms TTL=254
Reply from 11.0.0.2: bytes=32 time=2ms TTL=254
Reply from 11.0.0.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.10.255:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 11ms, Average = 3ms

SERVER>
```

Ping al broadcast de la red 192.168.10.0

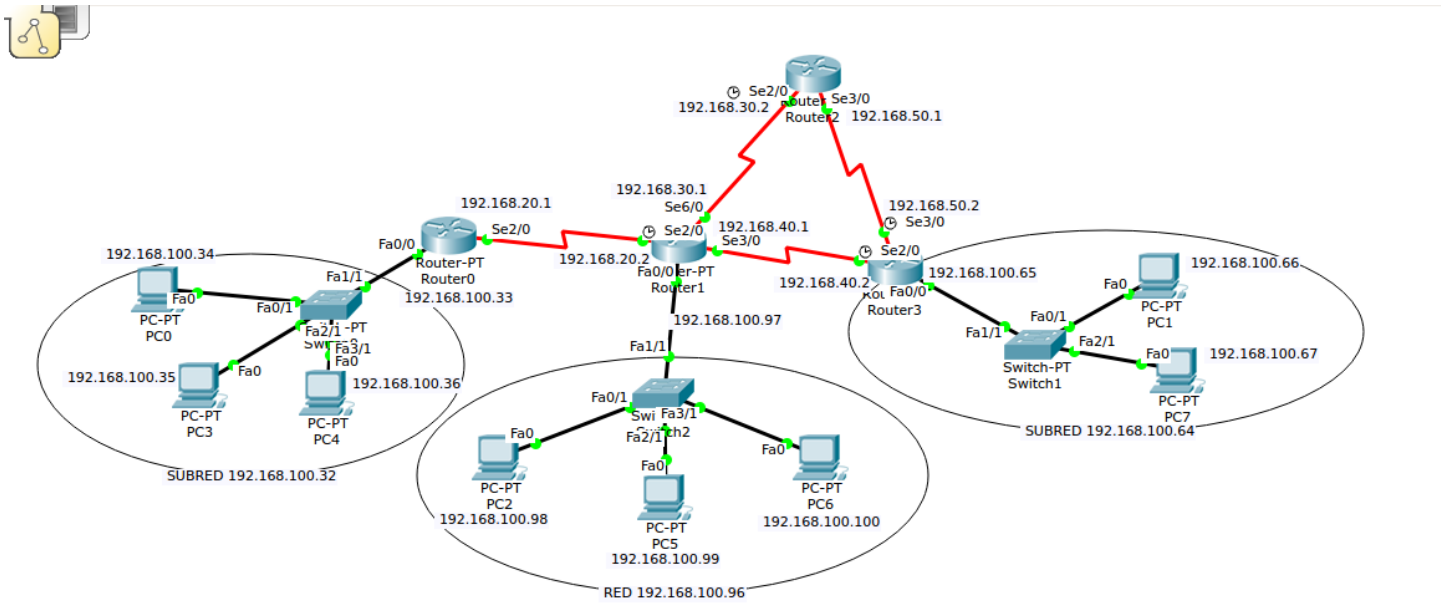
```
SERVER>ping 192.168.20.255

Pinging 192.168.20.255 with 32 bytes of data:

Reply from 12.0.0.2: bytes=32 time=1ms TTL=254
Reply from 12.0.0.2: bytes=32 time=1ms TTL=254
Reply from 12.0.0.2: bytes=32 time=1ms TTL=254
Reply from 12.0.0.2: bytes=32 time=1ms TTL=254

Ping statistics for 192.168.20.255:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms

SERVER>
```

Ping al broadcast de la red 192.168.20.0

```
SERVER>ping 192.168.30.255

Pinging 192.168.30.255 with 32 bytes of data:

Reply from 12.0.0.1: bytes=32 time=8ms TTL=254
Reply from 12.0.0.1: bytes=32 time=1ms TTL=254
Reply from 12.0.0.1: bytes=32 time=1ms TTL=254
Reply from 12.0.0.1: bytes=32 time=8ms TTL=254

Ping statistics for 192.168.30.255:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 8ms, Average = 4ms

SERVER>
```

Ping al broadcast de la red 192.168.30.0

5.6 Proporcione una solución al siguiente problema, se tiene implementada una WAN que responde a la siguiente topología:



Cuestionario

6.1 ¿Qué función cumplen las claves en los routers y que tipo existen?

Las claves en los routers, como en cualquier dispositivo, sirven para dar seguridad al router. Especificamente, para que ninugna persona no autorizada pueda entrar al router y configurarlo.

Cifrado WEB
El cifrado WEP fue uno de los primeros cifrados utilizados para proteger las redes inalámbricas. Este cifrado es débil y vulnerable y, aunque en el pasado podía servir más o menos, actualmente con la potencia de los sistemas informáticos domésticos y las aplicaciones desarrolladas para explotar este tipo de cifrado, finalmente se considera un cifrado “inseguro” y es posible obtener su clave en tan solo unos minutos capturando paquetes mediante falsas solicitudes de acceso.

Cifrado WAP
El cifrado WPA nació a partir de la necesidad de solucionar los problemas del cifrado WEP. Este sistema de cifrado ofrece una serie de variantes según la finalidad que se le vaya a dar.

Cifrado WPA2
El cifrado WPA2 es la actualización del cifrado WPA y mejora tanto la seguridad como el rendimiento de este. Este sistema también cuenta con las variantes de claves personales PSK y sistemas RADIUS para la gestión de redes, aunque el cifrado es muy superior al de WPA.

6.2 ¿Qué se entiende por convergencia de la red?

Las redes convergentes o redes de multiservicio hacen referencia a la integración de los servicios de voz, datos y video sobre una sola red basada en IP como protocolo de nivel de red. En este artículo se presenta la integración de servicios de voz sobre redes IP (VoIP) como ejemplo de red convergente. La arquitectura de esta red está constituida básicamente, por el media gateway, el controlador de media gateway, el gateway de señalización y el gatekeeper. Las redes de convergencia han tenido y tendrán aún dificultades técnicas qué superar ya que los distintos servicios por ofrecer tienen diferentes características y requerimientos de red, por tanto es importante hablar aquí de ingeniería de tráfico y mecanismos que garanticen calidades de servicio.

6.3 Defina el concepto de gateway

Es el dispositivo que actúa de interfaz de conexión entre aparatos o dispositivos, y también posibilita compartir recursos entre dos o más computadoras. Su propósito es traducir la información del protocolo utilizado en una red inicial, al protocolo usado en la red de destino. La dirección Ip del gatewat, por buenas prácticas, es la primera dirección después de la dirección de red.

Conclusiones

- La seguridad en routers es un tema importante que aún sigue siendo investigado.
- El ruteo estático tine beneficios como la seguridad, pero si las redes crecen, se hace prácticamente imposible hacer el ruteo estático.