

Práctica 7


Redes de computadoras

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1. Pasos para desarrollar la práctica

Se borra la configuración RIP de los routers UNAM, Google y Telmex. Para eso se usa el comando `no router rip`.



```
R-UNAM>enable
R-UNAM#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R-UNAM(config)#no router rip
R-UNAM(config)#

Ctrl+F6 to exit CLI focus
```

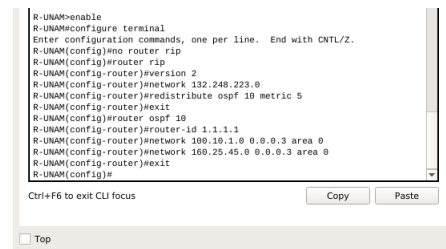
```
R-Google>enable
R-Google#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R-Google(config)#no router rip
R-Google(config)#

Ctrl+F6 to exit CLI focus
```

```
R-Telmex>enable
R-Telmex#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R-Telmex(config)#no router rip
R-Telmex(config)#

Ctrl+F6 to exit CLI focus
```

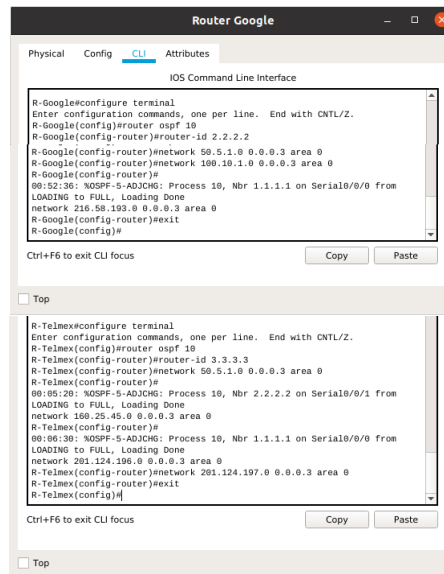
En el router de la UNAM se configuran los protocolos RIP y OSPF.



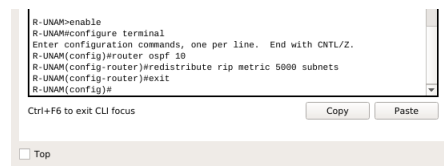
```
R-UNAM>enable
R-UNAM#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R-UNAM(config)#no router rip
R-UNAM(config)#router rip
R-UNAM(config-router)#version 2
R-UNAM(config-router)#network 132.248.223.0
R-UNAM(config-router)#redistribute ospf 10 metric 5
R-UNAM(config-router)#exit
R-UNAM(config)#router ospf 10
R-UNAM(config-router)#router-id 1.1.1.1
R-UNAM(config-router)#network 100.10.1.0 0.0.0.3 area 0
R-UNAM(config-router)#network 100.25.45.0 0.0.0.3 area 0
R-UNAM(config-router)#exit
R-UNAM(config)#

Ctrl+F6 to exit CLI focus
```

En los routers de Google y Telmex se configura solo el protocolo OSPF.



Se redistribuyen las rutas entre los routers DGTIC, Ciencias y el SW-Core que utilizan RIP. Esto se hace en el router UNAM.



Se guarda la configuración de cada router con `copy running-config startup-config`.

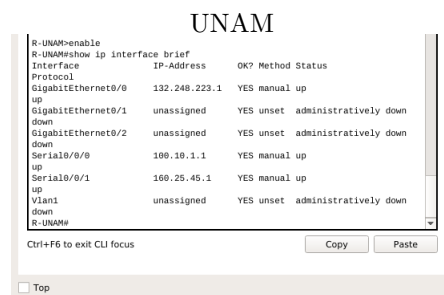
Para ver la configuración de cada router se ejecutan los siguientes comandos:

```

show ip interface brief
show ip route rip
show ip route ospf
show ip route

```

En los routers de Google y Telmex, el comando `show ip route rip` no muestra nada porque está inactivo este protocolo.



R - UNAM# ▼

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R-Googleshow ip route ospf

O E2 132.247.0.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

132.248.0.0/24 is subnetted, 5 subnets

O E2 132.248.148.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

O E2 132.248.181.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

O E2 132.248.220.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

O E2 132.248.222.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

O E2 132.248.223.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

160.25.0.0/30 is subnetted, 1 subnets

O 160.25.45.0 [110/1626] via 100.10.1.1, 00:34:51, Serial0/0/0

110/1626] via 50.5.1.2, 00:34:51, Serial0/0/1

O E2 192.168.10.0 [110/5000] via 100.10.1.1, 00:27:00, Serial0/0/0

O 201.124.196.0 [110/1563] via 50.5.1.2, 00:33:48, Serial0/0/1

O 201.124.197.0 [110/1563] via 50.5.1.2, 00:33:05, Serial0/0/1

R-Googles#

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50.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 50.5.1.0/30 is directly connected, Serial0/0/1

L 50.5.1.1/32 is directly connected, Serial0/0/1

O 100.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 100.10.1.0/30 is directly connected, Serial0/0/0

L 100.10.1.2/32 is directly connected, Serial0/0/0

O E2 132.247.0.0/16 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

O E2 132.248.0.0/24 is subnetted, 5 subnets

O E2 132.248.148.0/24 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

O E2 132.248.181.0/24 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

O E2 132.248.220.0/24 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

O E2 132.248.222.0/24 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

O E2 132.248.223.0/24 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

160.25.0.0/30 is subnetted, 1 subnets

O 160.25.45.0/30 [110/1626] via 100.10.1.1, 00:35:44, Serial0/0/0

110/1626] via 50.5.1.2, 00:35:44, Serial0/0/1

O E2 192.168.10.0/24 [110/5000] via 100.10.1.1, 00:27:53, Serial0/0/0

O 201.124.196.0/24 [110/1563] via 50.5.1.2, 00:34:41, Serial0/0/1

O 201.124.197.0/24 [110/1563] via 50.5.1.2, 00:33:50, Serial0/0/1

O 216.58.193.0/24 is variably subnetted, 2 subnets, 2 masks

C 216.58.193.0/24 is directly connected, GigabitEthernet0/0

L 216.58.193.1/32 is directly connected, GigabitEthernet0/0

R-Googles#

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Telmex

R-Telmexenable

R-Telmexshow ip interface brief

Interface	IP-Address	OK?	Method	Status
Protocol				
GigabitEthernet0/0	201.124.196.1	YES	manual	up
up				
GigabitEthernet0/1	201.124.197.1	YES	manual	up
up				
GigabitEthernet0/2	unassigned	YES	unset	administratively down
down				
Serial0/0/0	160.25.45.2	YES	manual	up
up				
Serial0/0/1	50.5.1.2	YES	manual	up
up				
Vlan1	unassigned	YES	unset	administratively down
down				

R-Telmex#

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R-Telmexshow ip route ospf

O 100.0.0.0/30 is subnetted, 1 subnets

O 100.10.1.0 [110/1626] via 160.25.45.1, 00:30:50, Serial0/0/0

O E2 132.247.0.0 [110/5000] via 100.25.45.1, 00:30:54, Serial0/0/0

132.248.0.0/24 is subnetted, 5 subnets

O E2 132.248.148.0 [110/5000] via 160.25.45.1, 00:30:54, Serial0/0/0

O E2 132.248.181.0 [110/5000] via 160.25.45.1, 00:30:54, Serial0/0/0

O E2 132.248.220.0 [110/5000] via 160.25.45.1, 00:30:54, Serial0/0/0

O E2 132.248.222.0 [110/5000] via 160.25.45.1, 00:30:54, Serial0/0/0

O E2 132.248.223.0 [110/5000] via 160.25.45.1, 00:30:54, Serial0/0/0

O E2 192.168.10.0 [110/5000] via 160.25.45.1, 00:30:54, Serial0/0/0

O 216.58.193.0 [110/1563] via 50.5.1.1, 00:30:50, Serial0/0/1

R-Telmex#

Ctrl+F6 to exit CLI focus

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50.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 50.5.1.0/30 is directly connected, Serial0/0/1

L 50.5.1.2/32 is directly connected, Serial0/0/1

O 100.0.0.0/30 is subnetted, 1 subnets

O 100.10.1.0/30 [110/1626] via 160.25.45.1, 00:39:43, Serial0/0/0

O E2 132.247.0.0/16 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

O E2 132.248.0.0/24 is subnetted, 5 subnets

O E2 132.248.148.0/24 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

O E2 132.248.181.0/24 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

O E2 132.248.220.0/24 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

O E2 132.248.222.0/24 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

O E2 132.248.223.0/24 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

160.25.0.0/16 is variably subnetted, 2 subnets, 2 masks

C 160.25.45.0/30 is directly connected, Serial0/0/0

L 160.25.45.2/32 is directly connected, Serial0/0/0

O E2 192.168.10.0/24 [110/5000] via 160.25.45.1, 00:31:47, Serial0/0/0

O 201.124.196.0/24 is variably subnetted, 2 subnets, 2 masks

C 201.124.196.0/24 is directly connected, GigabitEthernet0/0

L 201.124.196.1/32 is directly connected, GigabitEthernet0/0

O 201.124.197.0/24 is variably subnetted, 2 subnets, 2 masks

C 201.124.197.0/24 is directly connected, GigabitEthernet0/1

L 201.124.197.1/32 is directly connected, GigabitEthernet0/1

O 216.58.193.0/24 [110/1563] via 50.5.1.1, 00:40:54, Serial0/0/1

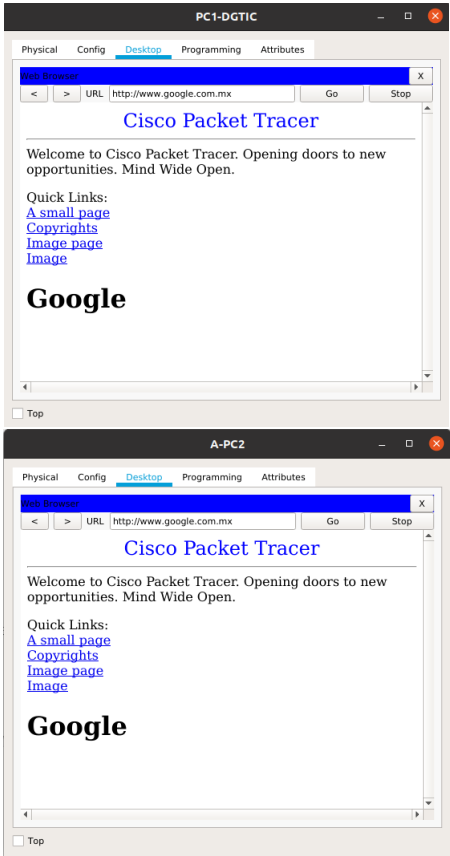
R-Telmex#

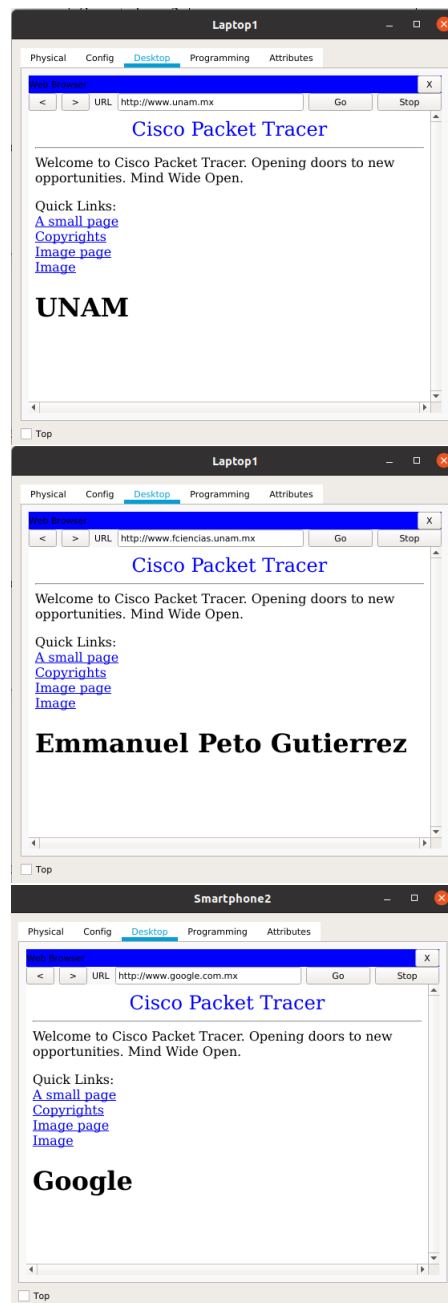
Ctrl+F6 to exit CLI focus

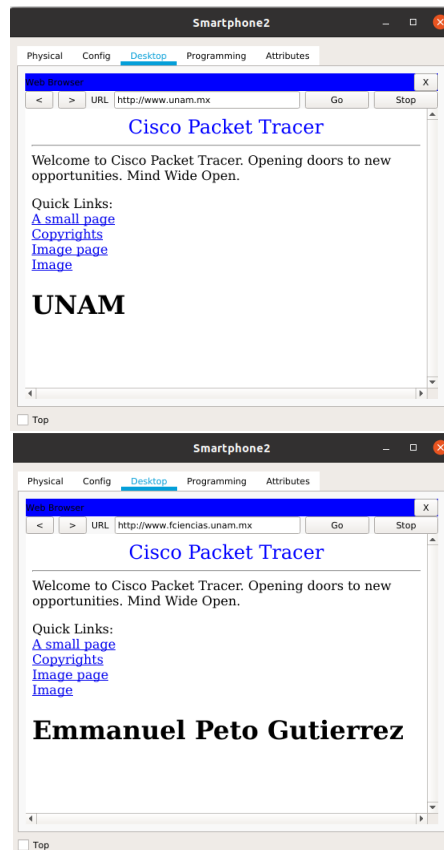
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Se comprueba que los siguientes dispositivos puedan ingresar a las páginas.

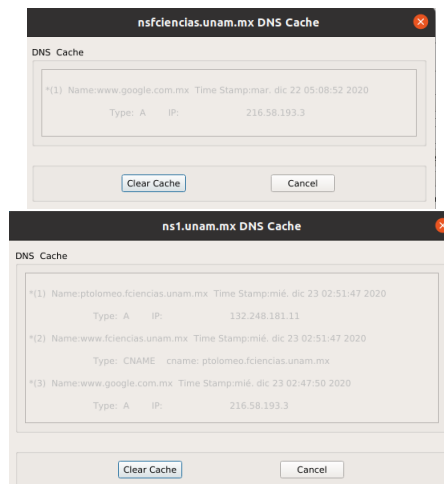
Dispositivo	Sitio web
PC1-DGTIC	www.google.com.mx
A-PC2	www.google.com.mx
Laptop1	www.unam.mx www.fcencias.unam.mx
Smartphone2	www.google.com.mx www.unam.mx www.fcencias.unam.mx

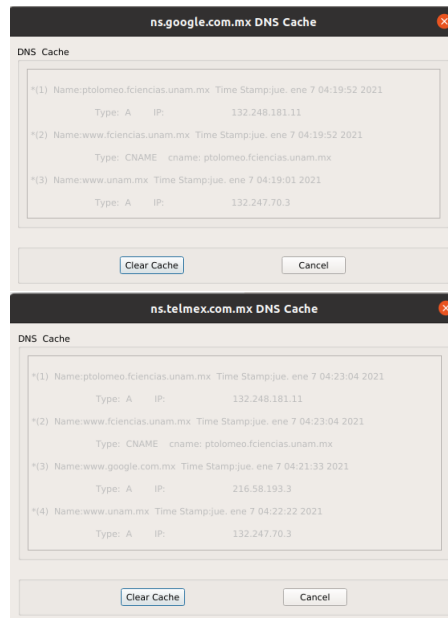






Finalmente se muestra la memoria caché de cada servidor DNS.





2. Cuestionario

- **¿Qué algoritmo de ruteo implementa OSPF versión 2?**

Es un protocolo link-state que utiliza inundación de información link-state y algoritmo de Dijkstra para calcular la ruta más corta.

- **¿Cuáles son las diferencias entre los protocolos de ruteo de interdominio y los protocolos de ruteo intradominio?**

Los protocolos de ruteo intradominio se ejecutan dentro de un mismo sistema autónomo para determinar la mejor ruta que deben seguir los paquetes, y dentro de un sistema autónomo todos los routers ejecutan el mismo algoritmo.

Un protocolo interdominio se utiliza entre diferentes sistemas autónomos, el cual, para empezar, encuentra el gateway adecuado para que los paquetes salgan del SA. Después, un router del otro lado del SA se encarga de enrutar los paquetes a su destino.

- **¿Qué tipo de protocolo de ruteo, interdominio o intradominio, son RIP y OSPF?**

Ambos son intradominio.