

1.- Eliminando las listas de acceso e implementando OSPF, tenemos la siguiente tabla de enrutamiento para Talin:

The screenshot shows the TalinRouter application window. The 'CLI' tab is selected, displaying the IOS Command Line Interface. The routing table is shown with the following entries:

```
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

1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    1.1.0.0/23 is directly connected, Loopback1
L    1.1.1.1/32 is directly connected, Loopback1
80.0.0.0/8 is variably subnetted, 19 subnets, 3 masks
C    80.82.0.0/23 is directly connected, GigabitEthernet0/0
L    80.82.0.1/32 is directly connected, GigabitEthernet0/0
C    80.82.2.0/23 is directly connected, GigabitEthernet0/0.10
L    80.82.2.1/32 is directly connected, GigabitEthernet0/0.10
O    80.82.4.0/23 [110/65] via 80.82.12.18, 00:03:37, Serial0/1/0
O    80.82.6.0/23 [110/65] via 80.82.12.30, 00:03:17, Serial0/1/1
O    80.82.8.0/23 [110/65] via 80.82.12.13, 00:02:47, Serial0/0/0
O    80.82.10.0/23 [110/65] via 80.82.12.2, 00:02:32, Serial0/0/1
C    80.82.12.0/30 is directly connected, Serial0/0/1
L    80.82.12.1/32 is directly connected, Serial0/0/1
O    80.82.12.4/30 [110/128] via 80.82.12.13, 00:02:32, Serial0/0/0
    [110/128] via 80.82.12.2, 00:02:32, Serial0/0/1
C    80.82.12.12/30 is directly connected, Serial0/0/0
L    80.82.12.14/32 is directly connected, Serial0/0/0
C    80.82.12.16/30 is directly connected, Serial0/1/0
L    80.82.12.17/32 is directly connected, Serial0/1/0
O    80.82.12.20/30 [110/128] via 80.82.12.13, 00:02:47, Serial0/0/0
    [110/128] via 80.82.12.18, 00:02:47, Serial0/1/0
O    80.82.12.24/30 [110/128] via 80.82.12.13, 00:02:47, Serial0/0/0
    [110/128] via 80.82.12.30, 00:02:47, Serial0/1/1
C    80.82.12.28/30 is directly connected, Serial0/1/1
L    80.82.12.29/32 is directly connected, Serial0/1/1

Router#
Router#
```

At the bottom of the CLI window, there are buttons for 'Copy' and 'Paste', and a 'Top' button. The 'Ctrl+F6 to exit CLI focus' message is also visible.

2- Implementado el protocolo EIGRP en todos los enrutadores, tenemos las siguientes tablas para el router de Tallin:

Tabla de enrutamiento para Tallin:

The screenshot shows the TalinRouter application window with the CLI tab selected. The title bar reads 'TalinRouter'. Inside the window, the 'IOS Command Line Interface' is active, displaying the following text:

```
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

1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    1.1.0.0/23 is directly connected, Loopback1
L    1.1.1.1/32 is directly connected, Loopback1
80.0.0.0/8 is variably subnetted, 19 subnets, 3 masks
C    80.82.0.0/23 is directly connected, GigabitEthernet0/0
L    80.82.0.1/32 is directly connected, GigabitEthernet0/0
C    80.82.2.0/23 is directly connected, GigabitEthernet0/0.10
L    80.82.2.1/32 is directly connected, GigabitEthernet0/0.10
D    80.82.4.0/23 [90/2172416] via 80.82.12.18, 00:01:29, Serial0/1/0
D    80.82.6.0/23 [90/2172416] via 80.82.12.30, 00:01:53, Serial0/1/1
D    80.82.8.0/23 [90/2172416] via 80.82.12.13, 00:02:12, Serial0/0/0
D    80.82.10.0/23 [90/2172416] via 80.82.12.2, 00:02:36, Serial0/0/1
C    80.82.12.0/30 is directly connected, Serial0/0/1
L    80.82.12.1/32 is directly connected, Serial0/0/1
D    80.82.12.4/30 [90/2681856] via 80.82.12.2, 00:02:36, Serial0/0/1
    [90/2681856] via 80.82.12.13, 00:02:12, Serial0/0/0
C    80.82.12.12/30 is directly connected, Serial0/0/0
L    80.82.12.14/32 is directly connected, Serial0/0/0
C    80.82.12.16/30 is directly connected, Serial0/1/0
L    80.82.12.17/32 is directly connected, Serial0/1/0
D    80.82.12.20/30 [90/2681856] via 80.82.12.13, 00:02:12, Serial0/0/0
    [90/2681856] via 80.82.12.18, 00:01:29, Serial0/1/0
D    80.82.12.24/30 [90/2681856] via 80.82.12.13, 00:02:12, Serial0/0/0
    [90/2681856] via 80.82.12.30, 00:01:53, Serial0/1/1
C    80.82.12.28/30 is directly connected, Serial0/1/1
L    80.82.12.29/32 is directly connected, Serial0/1/1

Router#
Router#
```

Below the CLI window, there is a status bar with the text 'Ctrl+F6 to exit CLI focus' and two buttons: 'Copy' and 'Paste'. At the bottom left of the application window, there is a checkbox labeled 'Top'.

La tabla de vecinos es la siguiente:

TalinRouter

Physical

Config

CLI

Attributes

IOS Command Line Interface

L 80.82.2.1/32 is directly connected, GigabitEthernet0/0.10

D 80.82.4.0/23 [90/2172416] via 80.82.12.18, 00:01:29, Serial0/1/0

D 80.82.6.0/23 [90/2172416] via 80.82.12.30, 00:01:53, Serial0/1/1

D 80.82.8.0/23 [90/2172416] via 80.82.12.13, 00:02:12, Serial0/0/0

D 80.82.10.0/23 [90/2172416] via 80.82.12.2, 00:02:36, Serial0/0/1

C 80.82.12.0/30 is directly connected, Serial0/0/1

L 80.82.12.1/32 is directly connected, Serial0/0/1

D 80.82.12.4/30 [90/2681856] via 80.82.12.2, 00:02:36, Serial0/0/1

[90/2681856] via 80.82.12.13, 00:02:12, Serial0/0/0

C 80.82.12.12/30 is directly connected, Serial0/0/0

L 80.82.12.14/32 is directly connected, Serial0/0/0

C 80.82.12.16/30 is directly connected, Serial0/1/0

L 80.82.12.17/32 is directly connected, Serial0/1/0

D 80.82.12.20/30 [90/2681856] via 80.82.12.13, 00:02:12, Serial0/0/0

[90/2681856] via 80.82.12.18, 00:01:29, Serial0/1/0

D 80.82.12.24/30 [90/2681856] via 80.82.12.13, 00:02:12, Serial0/0/0

[90/2681856] via 80.82.12.30, 00:01:53, Serial0/1/1

C 80.82.12.28/30 is directly connected, Serial0/1/1

L 80.82.12.29/32 is directly connected, Serial0/1/1

Router#

Router#show ip eigrp neigh

Router#show ip eigrp neighbors

IP-EIGRP neighbors for process 100

H	Address	Interface	Hold (sec)	Uptime	SRTT (ms)	RTO	Q Cnt	Seq Num
0	80.82.12.2	Se0/0/1	14	00:03:33	40	1000	0	24
1	80.82.12.13	Se0/0/0	14	00:03:09	40	1000	0	31
2	80.82.12.30	Se0/1/1	12	00:02:50	40	1000	0	28
3	80.82.12.18	Se0/1/0	13	00:02:26	40	1000	0	32

Router#

Router#

Router#

Router#

Ctrl+F6 to exit CLI focus

Copy

Paste

☐ Top

Y la tabla de topológica es la siguiente:

```
IP-EIGRP Topology Table for AS 100/ID(1.1.1.1)

Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply,
       r - Reply status

P 80.82.0.0/23, 1 successors, FD is 5120
   via Connected, GigabitEthernet0/0
P 80.82.2.0/23, 1 successors, FD is 28160
   via Connected, GigabitEthernet0/0.10
P 80.82.4.0/23, 1 successors, FD is 2172416
   via 80.82.12.18 (2172416/5120), Serial0/1/0
P 80.82.6.0/23, 1 successors, FD is 2172416
   via 80.82.12.30 (2172416/5120), Serial0/1/1
P 80.82.8.0/23, 1 successors, FD is 2172416
   via 80.82.12.13 (2172416/5120), Serial0/0/0
P 80.82.10.0/23, 1 successors, FD is 2172416
   via 80.82.12.2 (2172416/5120), Serial0/0/1
P 80.82.12.0/30, 1 successors, FD is 2169856
   via Connected, Serial0/0/1
P 80.82.12.4/30, 2 successors, FD is 2681856
   via 80.82.12.2 (2681856/2169856), Serial0/0/1
   via 80.82.12.13 (2681856/2169856), Serial0/0/0
P 80.82.12.12/30, 1 successors, FD is 2169856
   via Connected, Serial0/0/0
P 80.82.12.16/30, 1 successors, FD is 2169856
   via Connected, Serial0/1/0
P 80.82.12.20/30, 2 successors, FD is 2681856
   via 80.82.12.13 (2681856/2169856), Serial0/0/0
   via 80.82.12.18 (2681856/2169856), Serial0/1/0
P 80.82.12.24/30, 2 successors, FD is 2681856
   via 80.82.12.13 (2681856/2169856), Serial0/0/0
   via 80.82.12.30 (2681856/2169856), Serial0/1/1
P 80.82.12.28/30, 1 successors, FD is 2169856
   via Connected, Serial0/1/1

Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Comparando las tablas de enrutamiento, podemos notar que la implementación del protocolo de enrutamiento EIGRP hace que el protocolo tanto OSPF como el RIPv2 “desaparezca” de la tabla de enrutamiento, en otras palabras, los enrutadores optaran utilizar EIGRP debido a que posee una menor distancia administrativa en comparación tanto para protocolo RIPv2 como para el OSPF, logrando que ambos protocolos no aparezcan en la tabla de enrutamiento, aunque todos los protocolos estén activos, dominará el que tendrá menor distancia administrativa para los enrutadores, como en este caso será el EIGRP.

Comparando la tabla de enrutamiento con el taller de ospf, una de las principales diferencias es en cuanto al nivel de distancia administrativa, reduciendo su valor en varias decenas, además que el valor de las métricas empleadas es sumamente distintas debido a los métodos matemáticos empleados.

3- Si, existe un balanceo de carga en la tabla anterior debido a que se necesita optar por un protocolo que posea la menor distancia administrativa, calculando manualmente la métrica de EIGRP, desde Tallin a Lyon, tenemos la siguiente formula enseñada en clases:

$$\text{Métrica} = \left(\frac{10^7}{\text{Least-bandwidth}} + \text{acumulative delay} \right) * 256$$

Donde el ancho mínimo de banda para este caso es el mismo para todos, donde posee un valor de 1544 kbps, mientras que el retardo acumulado posee un valor de 20.000 segundos, ahora bien, reemplazando los valores en la ecuación y realizando la conversión correspondiente, tenemos que:

$$\text{Métrica} = \left(\frac{10^7}{1544} + \frac{20000}{10} \right) * 256 \text{ (para el caso de la primera división, nos da un valor de 6476,68.. que, en este caso, truncamos al decimal, trabajando solamente el valor de 6476)}$$

$$\text{Métrica} = 2169856$$

Comparando ambos resultados, podemos notar que la métrica obtenida manualmente coincide con el valor de la tabla de enrutamiento hacia la red LAN de Lyon