

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

The screenshot shows the TalinRouter application window with the CLI tab selected. The title bar reads 'TalinRouter'. Below the tabs (Physical, Config, CLI, Attributes), the text 'IOS Command Line Interface' is displayed. The main area shows the output of the 'show ip route' command. The output includes a legend for route types (E1, E2, E, EGP, i, L1, L2, ia, *, U, o, P), a message 'Gateway of last resort is not set', and a list of routes with their status (C for connected, L for local, R for recursive) and next-hop information. The routes are organized by network address ranges: 1.0.0.0/8, 1.1.0.0/23, 1.1.1.1/32, 80.0.0.0/8, and various subnets of 80.82.0.0/23 and 80.82.12.0/24. The prompt 'Router#' is visible at the bottom of the CLI window. Below the CLI window, there is a 'Ctrl+F6 to exit CLI focus' message and 'Copy' and 'Paste' buttons. At the very bottom, there is a 'Top' button.

```

TalinRouter

Physical Config CLI Attributes

IOS Command Line Interface

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

  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
R    80.82.4.0/23 [120/1] via 80.82.12.18, 00:00:24, Serial0/1/0
R    80.82.6.0/23 [120/1] via 80.82.12.30, 00:00:26, Serial0/1/1
R    80.82.8.0/23 [120/1] via 80.82.12.13, 00:00:18, Serial0/0/0
R    80.82.10.0/23 [120/1] via 80.82.12.2, 00:00:01, 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
R    80.82.12.4/30 [120/1] via 80.82.12.13, 00:00:18, Serial0/0/0
      [120/1] via 80.82.12.2, 00:00:01, 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
R    80.82.12.20/30 [120/1] via 80.82.12.13, 00:00:18, Serial0/0/0
      [120/1] via 80.82.12.18, 00:00:24, Serial0/1/0
R    80.82.12.24/30 [120/1] via 80.82.12.13, 00:00:18, Serial0/0/0
      [120/1] via 80.82.12.30, 00:00:26, 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

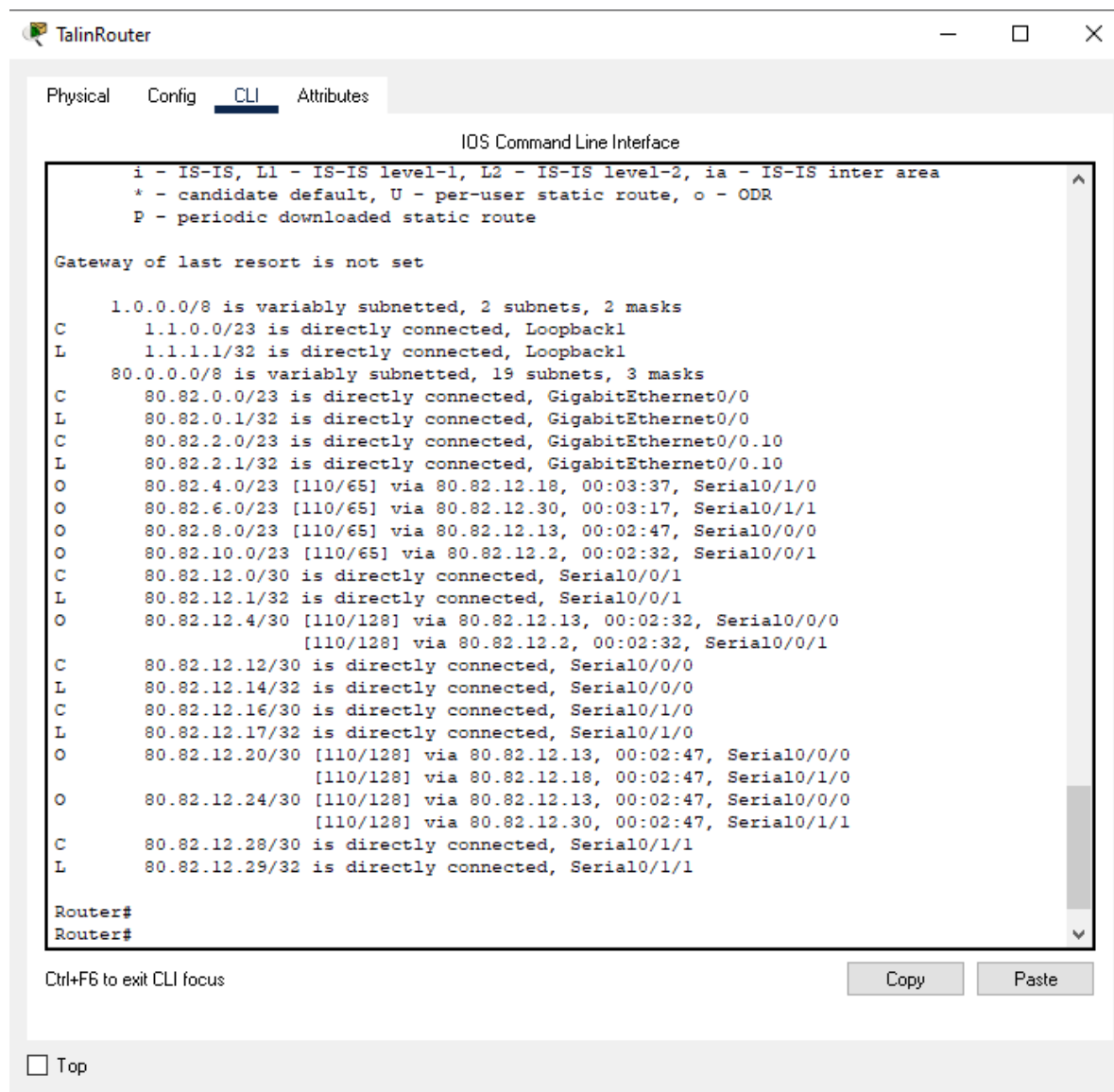
Router#

Ctrl+F6 to exit CLI focus

Copy Paste

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2- Implementando los loopbacks correspondientes, además del 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 interface shows a routing table with various entries, including loopbacks and static routes. The routing table is as follows:

Code	Destination/Prefix	Interface/Next Hop
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#

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

La tabla de vecinos es la siguiente:

TalinRouter

Physical Config CLI Attributes

IOS Command Line Interface

```
Maximum path: 4
Routing for Networks:
 80.82.0.0 0.0.255.255 area 0
Routing Information Sources:
 Gateway      Distance    Last Update
 1.1.1.1      110        00:03:08
 2.2.2.2      110        00:03:21
 3.3.3.3      110        00:03:17
 4.4.4.4      110        00:03:09
 5.5.5.5      110        00:03:08
Distance: (default is 110)

Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#
Router#show ip ospf ne
Router#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
4.4.4.4	0	FULL/ -	00:00:33	80.82.12.13	Serial0/0/0
5.5.5.5	0	FULL/ -	00:00:31	80.82.12.2	Serial0/0/1
2.2.2.2	0	FULL/ -	00:00:39	80.82.12.18	Serial0/1/0
3.3.3.3	0	FULL/ -	00:00:32	80.82.12.30	Serial0/1/1

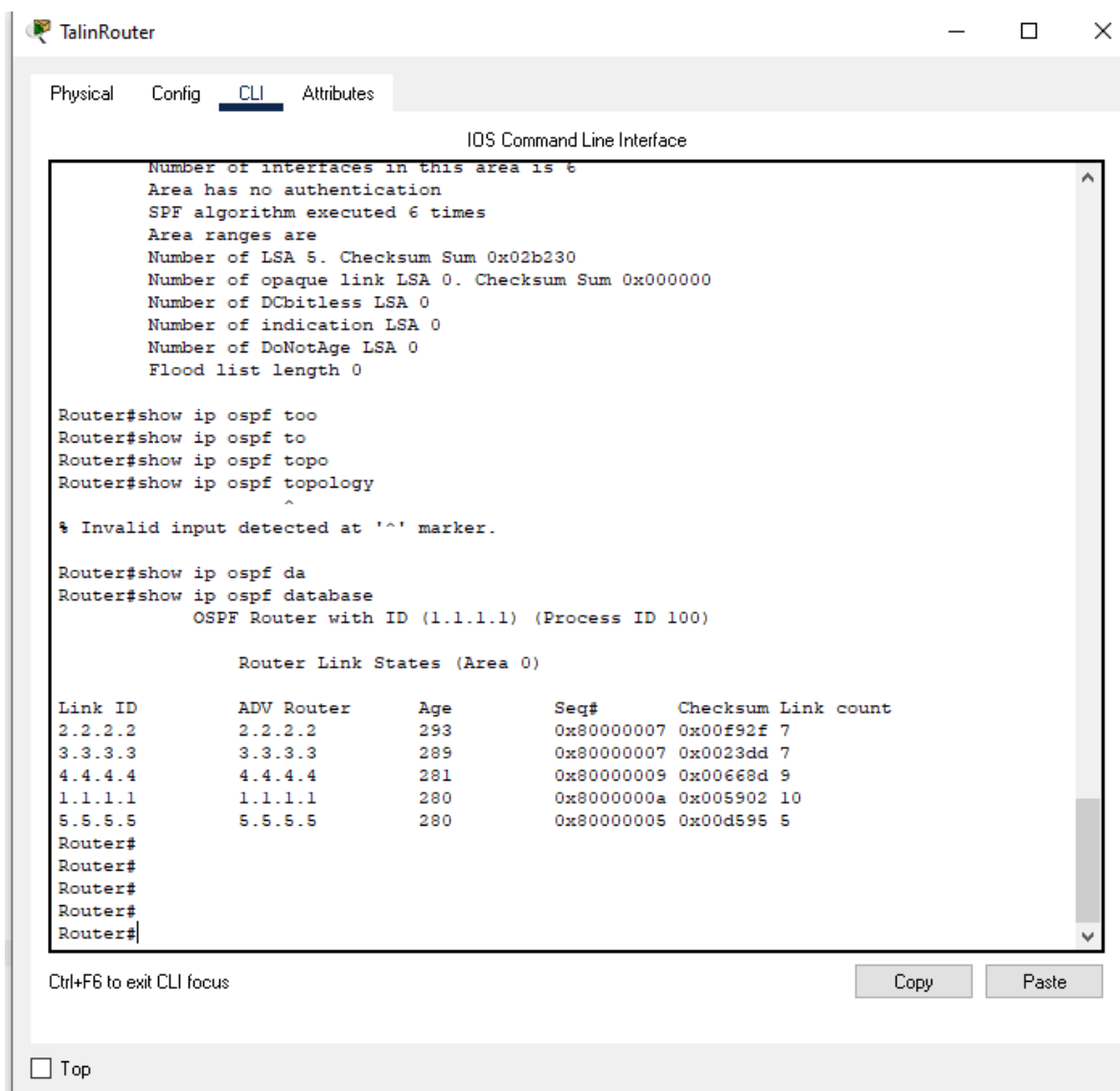
Router#
Router#
Router#
Router#
Router#
Router#

Ctrl+F6 to exit CLI focus

Copy Paste

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Y la tabla de topológica es la siguiente:



The screenshot shows the TalinRouter CLI interface with the following content:

```
IOS Command Line Interface

Number of interfaces in this area is 6
Area has no authentication
SPF algorithm executed 6 times
Area ranges are
Number of LSA 5. Checksum Sum 0x02b230
Number of opaque link LSA 0. Checksum Sum 0x000000
Number of DCbitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0

Router#show ip ospf too
Router#show ip ospf to
Router#show ip ospf topo
Router#show ip ospf topology
^
% Invalid input detected at '^' marker.

Router#show ip ospf da
Router#show ip ospf database
      OSPF Router with ID (1.1.1.1) (Process ID 100)

      Router Link States (Area 0)

Link ID        ADV Router    Age          Seq#           Checksum Link count
2.2.2.2        2.2.2.2       293          0x80000007    0x00f92f 7
3.3.3.3        3.3.3.3       289          0x80000007    0x0023dd 7
4.4.4.4        4.4.4.4       281          0x80000009    0x00668d 9
1.1.1.1        1.1.1.1       280          0x8000000a    0x005902 10
5.5.5.5        5.5.5.5       280          0x80000005    0x00d595 5
Router#
Router#
Router#
Router#
Router#
```

Below the CLI window, there is a "Ctrl+F6 to exit CLI focus" label and "Copy" and "Paste" buttons. At the bottom left, there is a "Top" button.

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

3- Si, existe un balanceo de carga en la tabla anterior, calculando manualmente la métrica de OSPF, desde Tallin a Lyon, tenemos la siguiente formula:

Métrica = 10^8 / Ancho de banda

Donde el ancho de banda desde Tallin a Lyon tiene un valor de 1544Kbps, por lo que, reemplazando en la fórmula, tenemos la siguiente fórmula:

Métrica = 10^8 / 1544000, calculando, el valor de métrica es de 64.76 , aproximando a 65 debido a que no se debe trabajar valores decimales (idealmente). Finalmente corroborando con la tabla de enrutamiento anterior, tenemos el mismo valor de la métrica calculada por el enrutador de Tallin, por lo que ambas métricas son correctas.