

# TP 10 - TOUJANI Mohamed - SANS BINOME

Tuesday, May 7, 2024 5:35 PM

Machine	Attribut	@IP	Netmask
PC0	Fa0	192.168.0.10	255.255.255.0
	passerelle par défaut	192.168.0.1	255.255.255.0
Laptop1	Fa0	192.168.3.10	255.255.255.0
	passerelle par défaut	192.168.3.1	255.255.255.0
Server0	Fa0	192.168.2.10	255.255.255.0
	passerelle par défaut	192.168.8.2	255.255.255.0
Server3	Fa0	192.168.7.10	255.255.255.0
	passerelle par défaut	192.168.7.1	255.255.255.0
Router0	Gig0/0	192.168.0.1	NONE
	Gig0/1	192.168.1.1	NONE
	Gig0/2	192.168.2.1	NONE
Router1	Gig0/0	192.168.3.1	NONE
	Gig0/1	192.168.1.2	NONE
	Gig0/2	192.168.4.1	NONE
Router2	Gig0/0	192.168.6.1	NONE
	Gig0/1	192.168.4.2	NONE
	Gig0/2	192.168.5.1	NONE
Router3	Gig0/0	192.168.6.2	NONE
	Gig0/1	192.168.8.1	NONE
	Gig0/2	192.168.7.1	NONE
Router4	Gig0/0	192.168.2.1	NONE
	Gig0/1	192.168.8.2	NONE
	Gig0/2	192.168.5.2	NONE

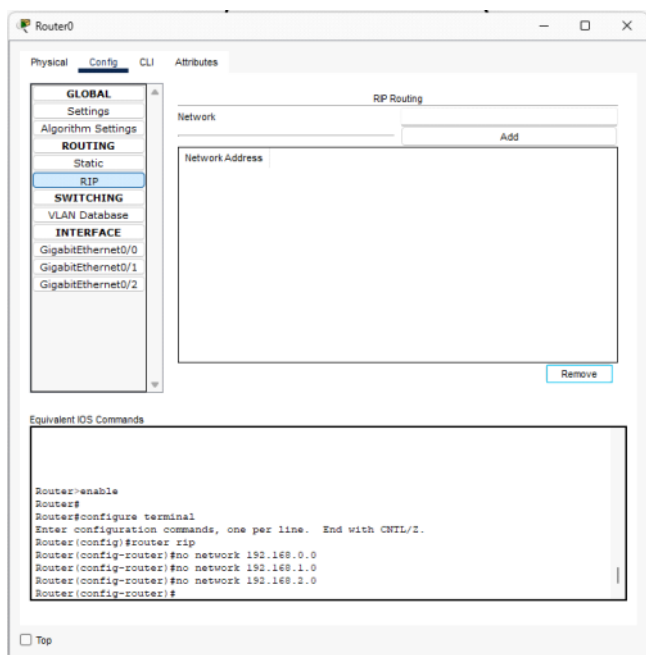
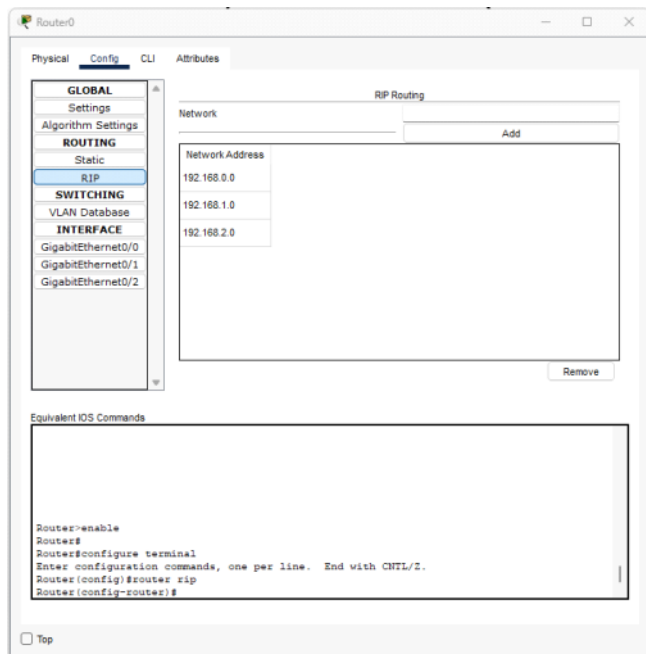
**Avec cette configuration, et après la mise de RIP, toutes les machines peuvent se pinguer.**

@ réseau destination	netmask	@IP de l'interface ou de la gateway	coût
192.168.0.0	255.255.255.0	192.168.5.1	3
192.168.1.0	255.255.255.0	192.168.5.1	2
192.168.2.0	255.255.255.0	Directement connectée	0
192.168.3.0	255.255.255.0	192.168.5.1	2
192.168.4.0	255.255.255.0	192.168.5.1	1
192.168.5.0	255.255.255.0	Directement connectée	0
192.168.6.0	255.255.255.0	192.168.5.1 ; 192.168.8.1	1
192.168.7.0	255.255.255.0	192.168.8.1	1
192.168.8.0	255.255.255.0	Directement connectée	0

# PARTIE OSPF

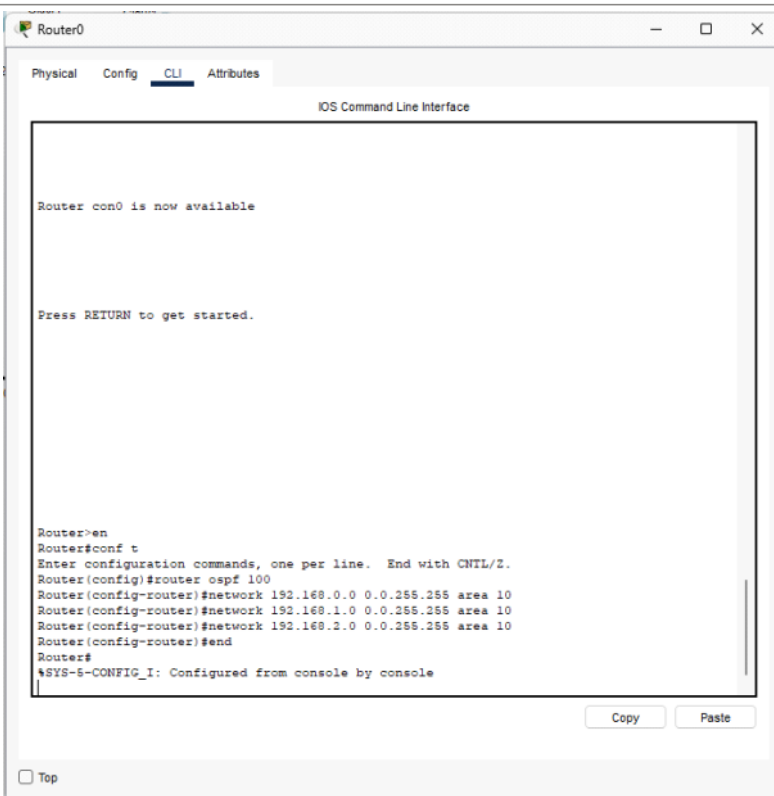
Désactiver RIP en supprimant les entrées de l'onglet RIP de chacun des routeurs.

## EXEMPLE ROUTER0



## La configuration OSPF dans la CLI de chaque routeur.

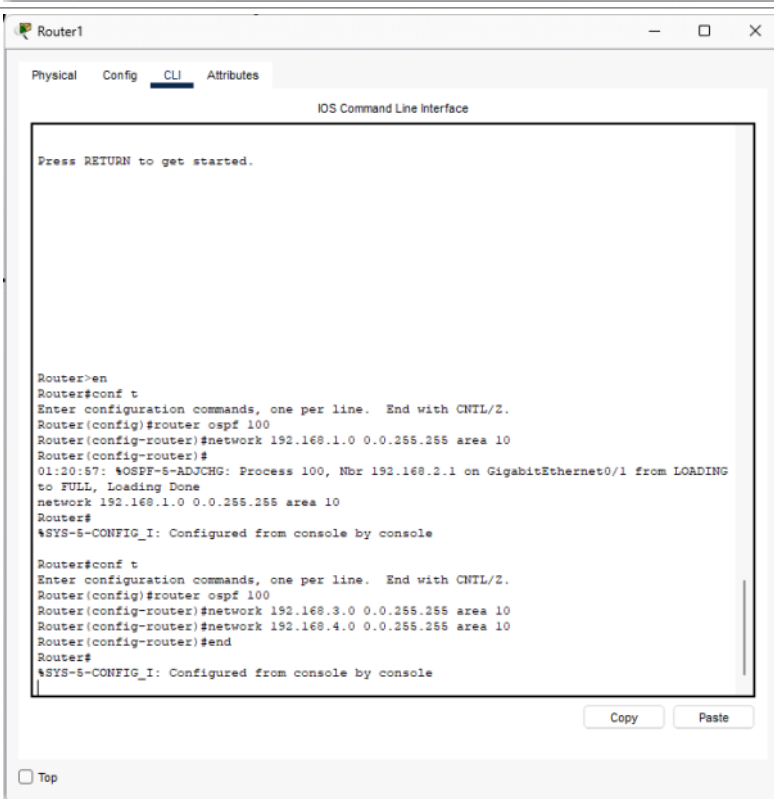
Router0



The screenshot shows the CLI window for Router0. The window has tabs for Physical, Config, CLI (selected), and Attributes. The main area displays the IOS Command Line Interface. The text shows the router is now available and prompts the user to press RETURN to get started. Below this, the configuration commands are entered: 'en' for enable mode, 'conf t' for configuration mode, 'router ospf 100' to start OSPF, and three 'network' commands for 192.168.0.0, 192.168.1.0, and 192.168.2.0 in area 10. The configuration ends with 'end'. A status message at the bottom indicates the configuration was successful.

```
Router0>en
Router0#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router0(config)#router ospf 100
Router0(config-router)#network 192.168.0.0 0.0.255.255 area 10
Router0(config-router)#network 192.168.1.0 0.0.255.255 area 10
Router0(config-router)#network 192.168.2.0 0.0.255.255 area 10
Router0(config-router)#end
Router0#
%SYS-5-CONFIG_I: Configured from console by console
```

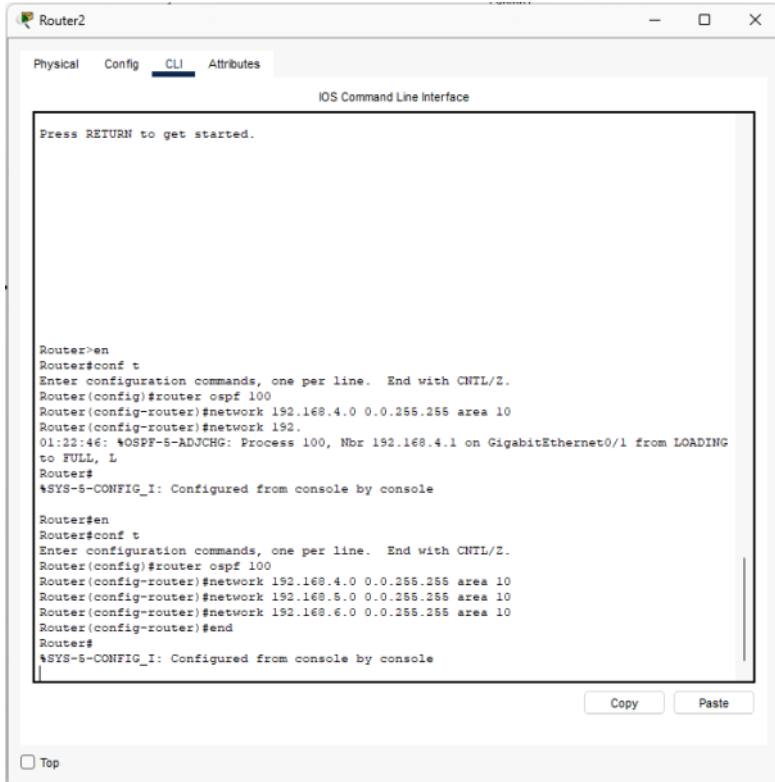
Router1



The screenshot shows the CLI window for Router1. The window has tabs for Physical, Config, CLI (selected), and Attributes. The main area displays the IOS Command Line Interface. The text shows the router is now available and prompts the user to press RETURN to get started. Below this, the configuration commands are entered: 'en' for enable mode, 'conf t' for configuration mode, 'router ospf 100' to start OSPF, and two 'network' commands for 192.168.1.0 and 192.168.2.1 in area 10. The configuration ends with 'end'. A status message at the bottom indicates the configuration was successful.

```
Router1>en
Router1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router1(config)#router ospf 100
Router1(config-router)#network 192.168.1.0 0.0.255.255 area 10
Router1(config-router)#network 192.168.2.1 0.0.255.255 area 10
Router1(config-router)#end
Router1#
%SYS-5-CONFIG_I: Configured from console by console
```

## Router2



Router2

Physical Config CLI Attributes

IOS Command Line Interface

Press RETURN to get started.

```

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 100
Router(config-router)#network 192.168.4.0 0.0.255.255 area 10
Router(config-router)#network 192.
01:22:46: %OSPF-5-ADJCHG: Process 100, Nbr 192.168.4.1 on GigabitEthernet0/1 from LOADING
to FULL, L
Router#
%SYS-5-CONFIG_I: Configured from console by console

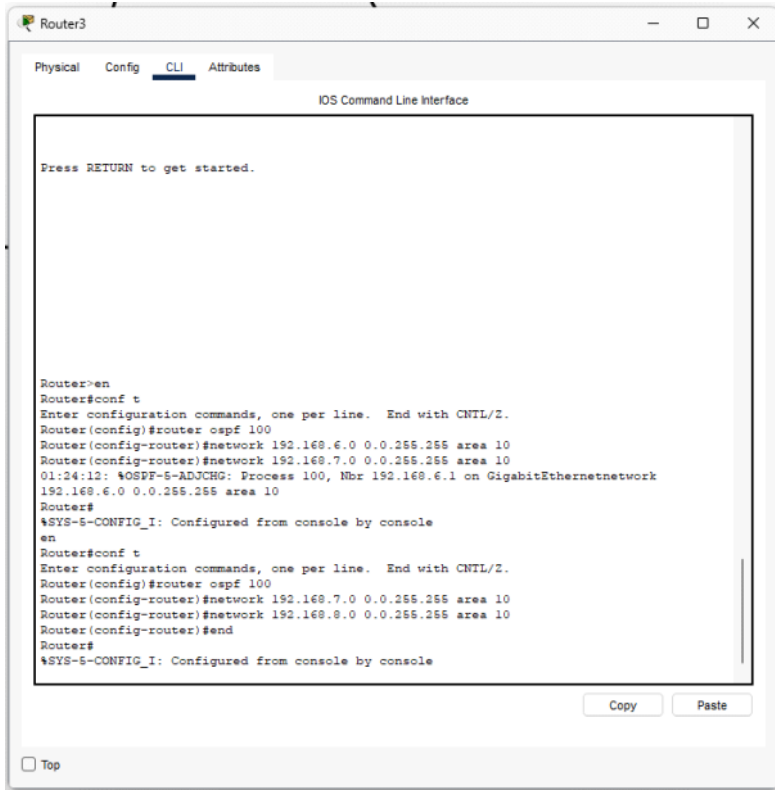
Router#en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 100
Router(config-router)#network 192.168.4.0 0.0.255.255 area 10
Router(config-router)#network 192.168.5.0 0.0.255.255 area 10
Router(config-router)#network 192.168.6.0 0.0.255.255 area 10
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

```

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## Router3



Router3

Physical Config CLI Attributes

IOS Command Line Interface

Press RETURN to get started.

```

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 100
Router(config-router)#network 192.168.6.0 0.0.255.255 area 10
Router(config-router)#network 192.168.7.0 0.0.255.255 area 10
01:24:12: %OSPF-5-ADJCHG: Process 100, Nbr 192.168.6.1 on GigabitEthernetnetwork
192.168.6.0 0.0.255.255 area 10
Router#
%SYS-5-CONFIG_I: Configured from console by console

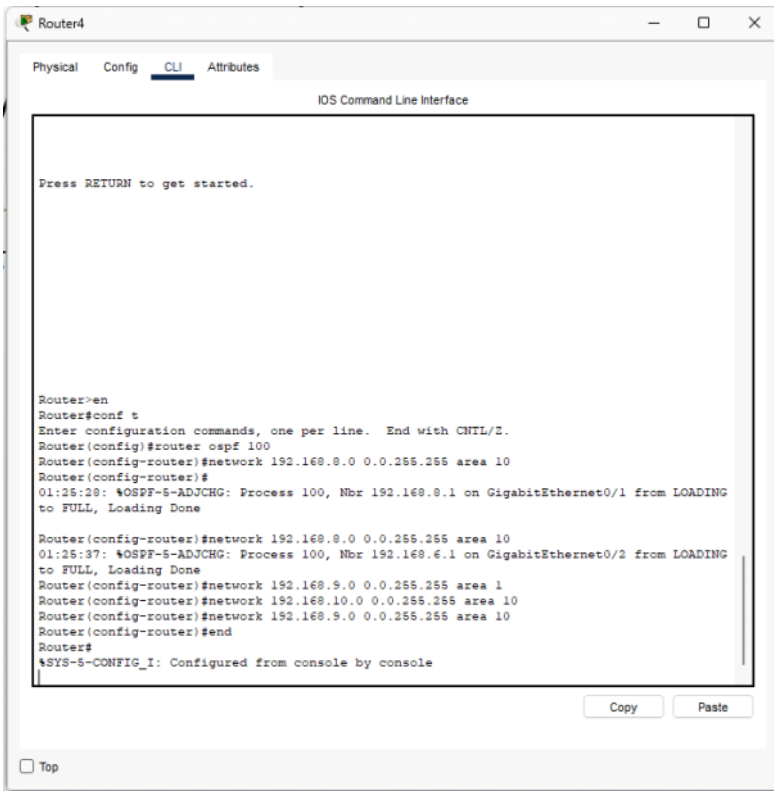
en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 100
Router(config-router)#network 192.168.7.0 0.0.255.255 area 10
Router(config-router)#network 192.168.8.0 0.0.255.255 area 10
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

```

Copy Paste

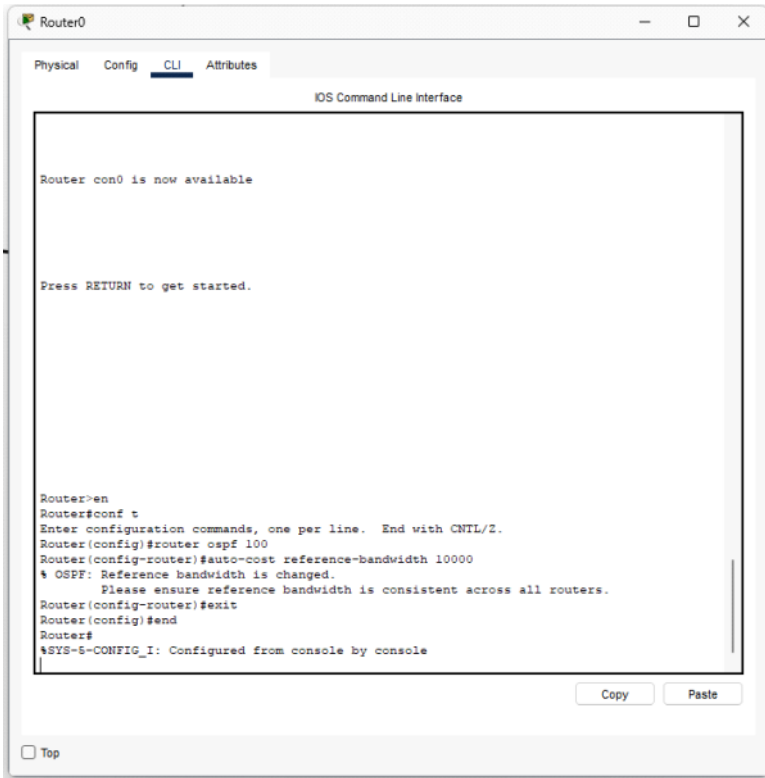
☐ Top

## Router4



## Les commandes auto-cost

Router0



The screenshot shows the CLI interface of Router0. The 'CLI' tab is selected. The interface displays the following text:

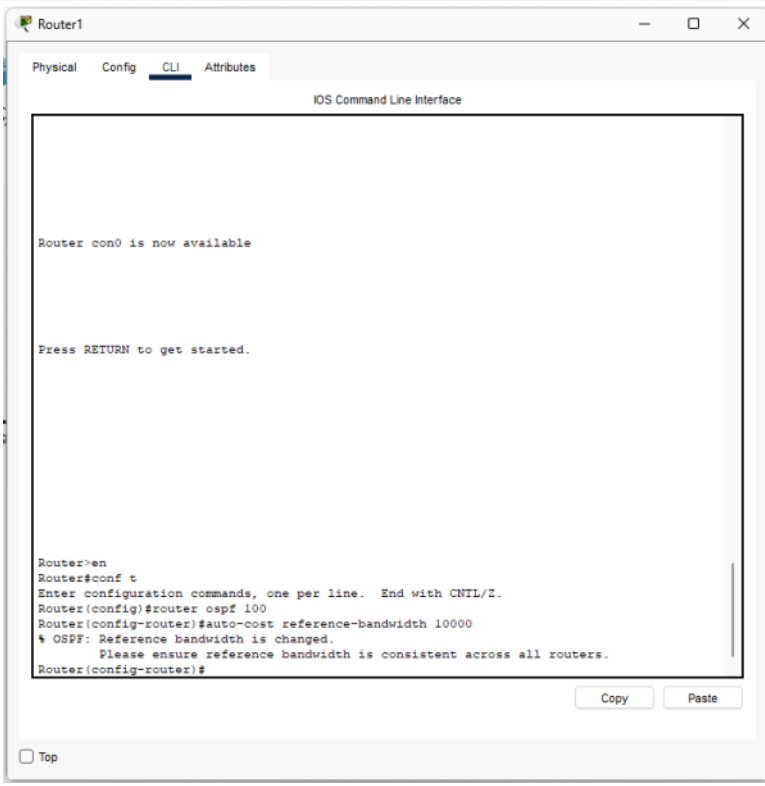
```
Router con0 is now available

Press RETURN to get started.

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 100
Router(config-router)#auto-cost reference-bandwidth 10000
* OSPF: Reference bandwidth is changed.
   Please ensure reference bandwidth is consistent across all routers.
Router(config-router)#exit
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the terminal window, there are 'Copy' and 'Paste' buttons, and a 'Top' link.

Router1



The screenshot shows the CLI interface of Router1. The 'CLI' tab is selected. The interface displays the following text:

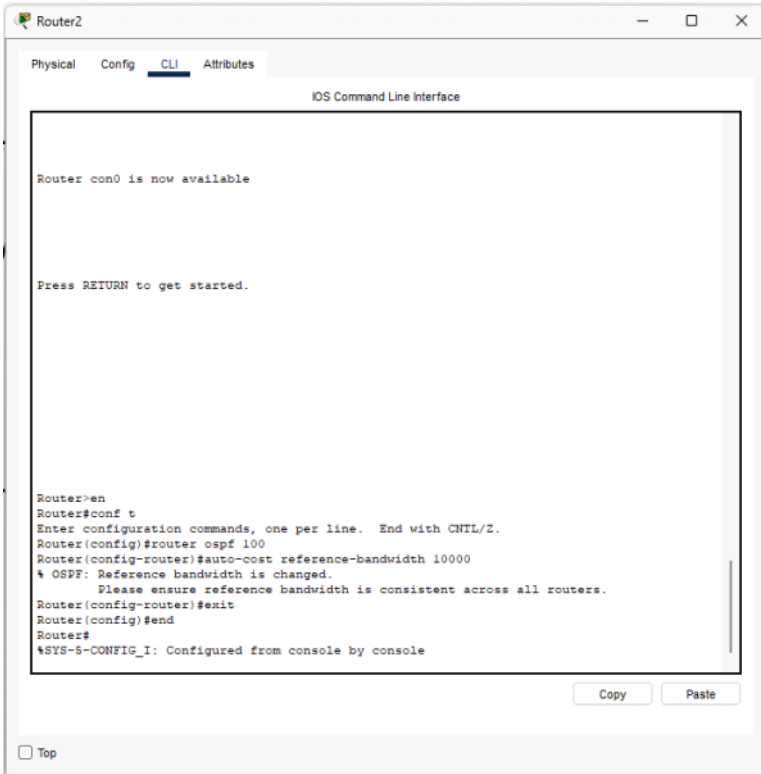
```
Router con0 is now available

Press RETURN to get started.

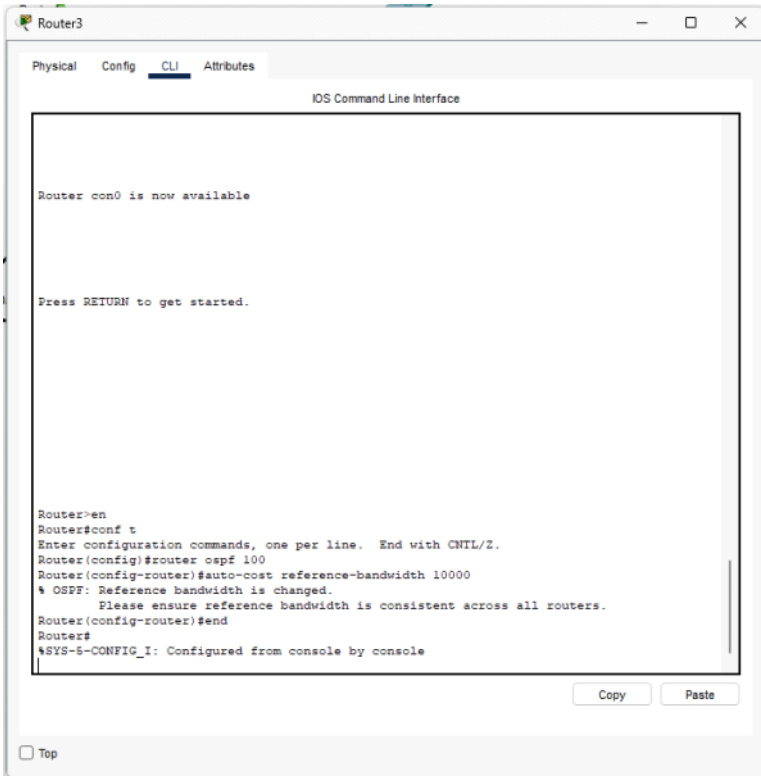
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 100
Router(config-router)#auto-cost reference-bandwidth 10000
* OSPF: Reference bandwidth is changed.
   Please ensure reference bandwidth is consistent across all routers.
Router(config-router)#
```

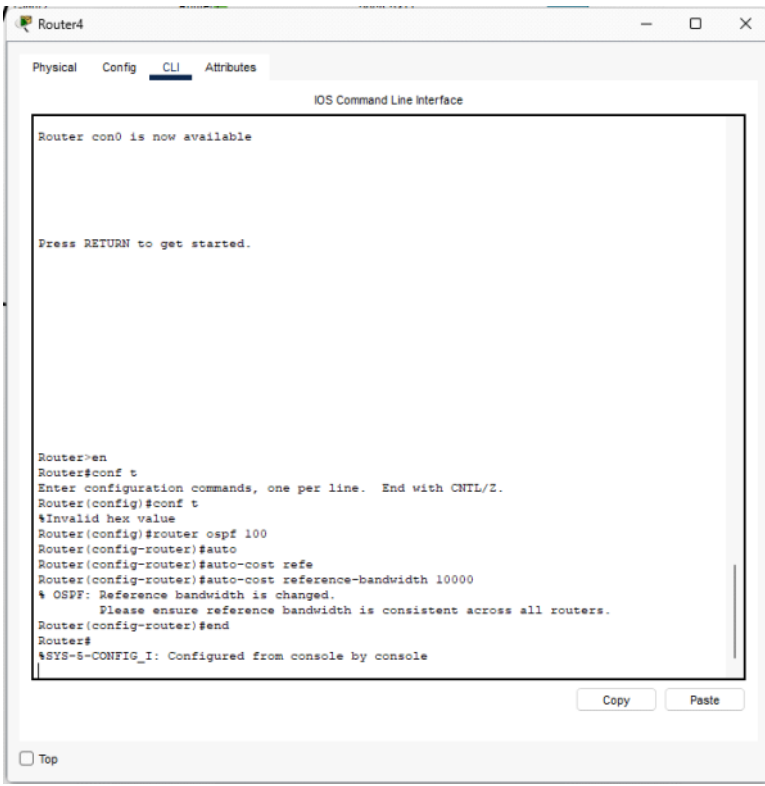
At the bottom of the terminal window, there are 'Copy' and 'Paste' buttons, and a 'Top' link.

## Router2



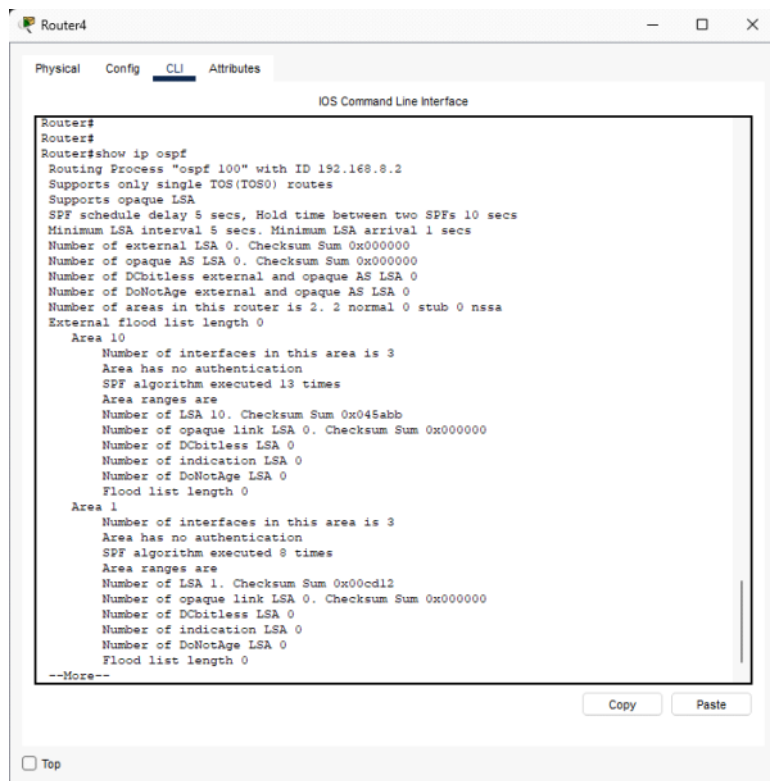
## Router3





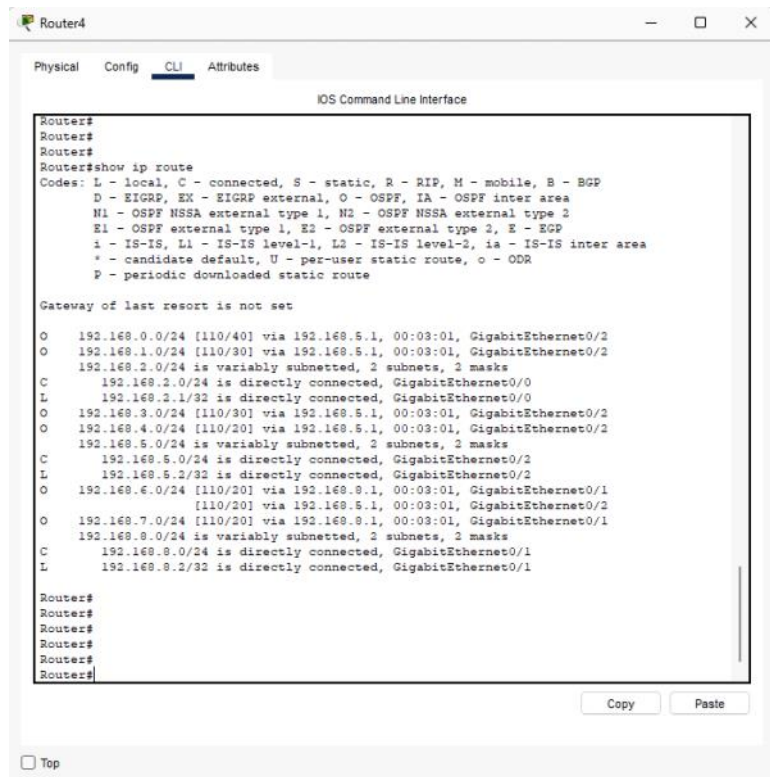


## Les commandes show ip route, ip ospf, etc.



The screenshot shows the CLI of Router4 with the 'show ip ospf' command executed. The output displays OSPF configuration details for process 100, including supported features, timers, LSA counts, and area information for Area 0 and Area 1. A 'Top' button is visible at the bottom left.

```
Router#
Router#
Router#show ip ospf
Routing Process "ospf 100" with ID 192.168.8.2
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x0000000
Number of opaque AS LSA 0. Checksum Sum 0x0000000
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
External flood list length 0
Area 0
  Number of interfaces in this area is 3
  Area has no authentication
  SPF algorithm executed 13 times
  Area ranges are
  Number of LSA 10. Checksum Sum 0x045abb
  Number of opaque link LSA 0. Checksum Sum 0x0000000
  Number of DCbitless LSA 0
  Number of indication LSA 0
  Number of DoNotAge LSA 0
  Flood list length 0
Area 1
  Number of interfaces in this area is 3
  Area has no authentication
  SPF algorithm executed 8 times
  Area ranges are
  Number of LSA 1. Checksum Sum 0x00cd12
  Number of opaque link LSA 0. Checksum Sum 0x0000000
  Number of DCbitless LSA 0
  Number of indication LSA 0
  Number of DoNotAge LSA 0
  Flood list length 0
--More--
Copy Paste
```



The screenshot shows the CLI of Router4 with the 'show ip route' command executed. The output lists the routing table, including codes for route types (L, D, O, N1, N2, E1, E2, I, U, P) and a list of routes with their metrics and interfaces. A 'Top' button is visible at the bottom left.

```
Router#
Router#
Router#
Router#show ip route
Codes: L - local, C - connected, S - static, 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

O 192.168.0.0/24 [110/40] via 192.168.5.1, 00:03:01, GigabitEthernet0/2
O 192.168.1.0/24 [110/30] via 192.168.5.1, 00:03:01, GigabitEthernet0/2
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.2.0/24 is directly connected, GigabitEthernet0/0
L 192.168.2.1/32 is directly connected, GigabitEthernet0/0
O 192.168.3.0/24 [110/30] via 192.168.5.1, 00:03:01, GigabitEthernet0/2
O 192.168.4.0/24 [110/20] via 192.168.5.1, 00:03:01, GigabitEthernet0/2
192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.5.0/24 is directly connected, GigabitEthernet0/2
L 192.168.5.2/32 is directly connected, GigabitEthernet0/2
O 192.168.6.0/24 [110/20] via 192.168.5.1, 00:03:01, GigabitEthernet0/1
[110/20] via 192.168.5.1, 00:03:01, GigabitEthernet0/2
O 192.168.7.0/24 [110/20] via 192.168.5.1, 00:03:01, GigabitEthernet0/1
192.168.8.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.8.0/24 is directly connected, GigabitEthernet0/1
L 192.168.8.2/32 is directly connected, GigabitEthernet0/1

Router#
Router#
Router#
Router#
Router#
```

```

Router#
Router#
Router#
Router#show ip ospf neighbor

Neighbor ID      Pri   State           Dead Time   Address        Interface
192.168.2.1      1     EXSTART/DR      00:00:31   192.168.2.1   GigabitEthernet0/0
192.168.8.1      1     FULL/BDR        00:00:31   192.168.8.1   GigabitEthernet0/1
192.168.6.1      1     FULL/BDR        00:00:36   192.168.5.1   GigabitEthernet0/2
Router#

```

☐ Top

```

Router#show ip ospf da
Router#show ip ospf database
      OSPF Router with ID (192.168.8.2) (Process ID 100)

      Router Link States (Area 1)

Link ID      ADV Router   Age         Seq#         Checksum Link count
192.168.8.2  192.168.8.2  239         0x80000006  0x00cd12  3

      Router Link States (Area 10)

Link ID      ADV Router   Age         Seq#         Checksum Link count
192.168.4.1  192.168.4.1  511         0x80000008  0x00a76c  3
192.168.8.1  192.168.8.1  420         0x80000009  0x00e80b  3
192.168.2.1  192.168.2.1  362         0x80000007  0x008afe  3
192.168.6.1  192.168.6.1  302         0x8000000a  0x00157c  3
192.168.8.2  192.168.8.2  241         0x80000009  0x002cca  3

      Net Link States (Area 10)

Link ID      ADV Router   Age         Seq#         Checksum
192.168.1.1  192.168.2.1  1057        0x80000001  0x007158
192.168.4.1  192.168.4.1  948         0x80000001  0x005e62
192.168.6.1  192.168.6.1  862         0x80000001  0x00f825
192.168.8.2  192.168.8.2  728         0x80000001  0x00091f
192.168.5.2  192.168.8.2  723         0x80000002  0x002902
Router#

```

☐ Top

```

Router#show ip protocols

Routing Protocol is "ospf 100"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.168.8.2
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.0.0 0.0.255.255 area 1
    192.168.0.0 0.0.255.255 area 10
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.168.2.1      110          00:06:28
    192.168.4.1      110          00:08:57
    192.168.6.1      110          00:05:28
    192.168.8.1      110          00:07:26
    192.168.8.2      110          00:04:27
  Distance: (default is 110)
Router#

```

☐ Top

## EN RÉSUMÉ :

A quoi servent ces commandes ?	REPONSE
Router# show ip ospf	affiche des informations détaillées sur les instances OSPF en cours d'exécution sur le routeur.
Router# show ip route	affiche la table de routage IP du routeur.
Router# show ip ospf neighbor	afficher des détails sur les relations de voisinage OSPF du routeur.
Router# show ip ospf database	Cette commande montre la base de données d'état de lien OSPF du routeur.
Router# show ip protocols	Cette commande fournit un résumé de tous les protocoles de routage qui sont configurés sur le routeur.

## La table de routage de R4.

@ réseau destination	netmask	@IP de l'interface ou de la gateway	coût
192.168.0.0	255.255.255.0	192.168.5.1	40
192.168.1.0	255.255.255.0	192.168.5.1	30
192.168.2.0	255.255.255.0	Directement connectée	0
192.168.3.0	255.255.255.0	192.168.5.1	30
192.168.4.0	255.255.255.0	192.168.5.1	20
192.168.5.0	255.255.255.0	Directement connectée	0
192.168.6.0	255.255.255.0	192.168.5.1 ; 192.168.8.1	20
192.168.7.0	255.255.255.0	192.168.8.1	20
192.168.8.0	255.255.255.0	Directement connectée	0