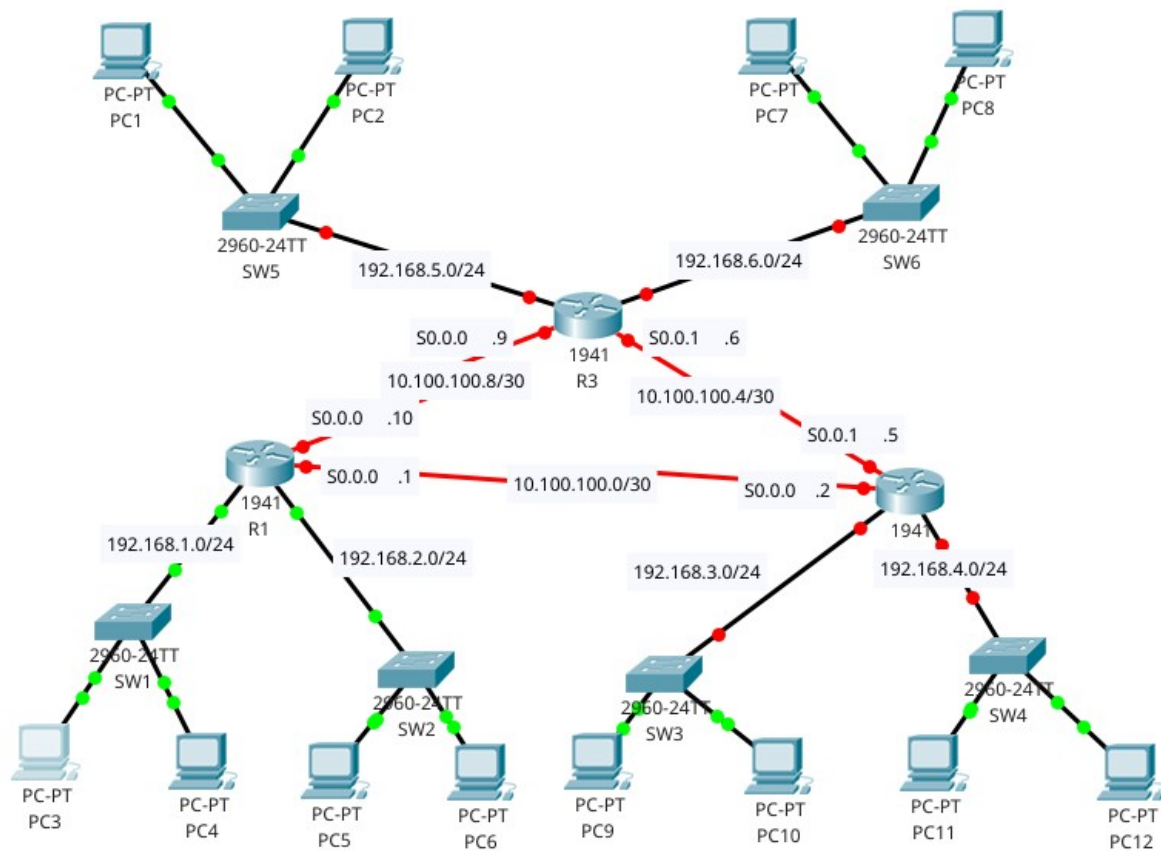


## Synthèse

### Schéma du réseau :



### Configuration des routeurs :

→ R1 :

```
Router>en
Router#conf t
Router(config)#hostname R1
R1(config)#int s0/0/0
R1(config-if)#ip address 10.100.100.1 255.255.255.252
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#ip address 10.100.100.1 255.255.255.252
R1(config)#int s0/0/1
R1(config-if)#ip address 10.100.100.10 255.255.255.252
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#int g0/1
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#int g0/0
```

```

R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#ip route 192.168.5.0 255.255.255.0 10.100.100.9
R1(config)#ip route 192.168.6.0 255.255.255.0 10.100.100.9
R1(config)#ip route 192.168.3.0 255.255.255.0 10.100.100.2
R1(config)#ip route 192.168.4.0 255.255.255.0 10.100.100.2
R1(config)#ip route 0.0.0.0 0.0.0.0 10.100.100.9
R1(config)#ip route 0.0.0.0 0.0.0.0 10.100.100.2 5
R1(config)#exit

```

R1#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  
 i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  
 a - application route  
 + - replicated route, % - next hop override

Gateway of last resort is 10.100.100.9 to network 0.0.0.0

```

S*  0.0.0.0/0 [1/0] via 10.100.100.9
    10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C    10.100.100.0/30 is directly connected, Serial0/0/0
L    10.100.100.1/32 is directly connected, Serial0/0/0
C    10.100.100.8/30 is directly connected, Serial0/0/1
L    10.100.100.10/32 is directly connected, Serial0/0/1
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, GigabitEthernet0/0
L    192.168.1.1/32 is directly connected, GigabitEthernet0/0
    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.2.0/24 is directly connected, GigabitEthernet0/1
L    192.168.2.1/32 is directly connected, GigabitEthernet0/1
S    192.168.3.0/24 [1/0] via 10.100.100.2
S    192.168.4.0/24 [1/0] via 10.100.100.2
S    192.168.5.0/24 [1/0] via 10.100.100.9
S    192.168.6.0/24 [1/0] via 10.100.100.9

```

R1#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Prot
Embedded-Service-Engine0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0	192.168.1.1	YES	manual	up	up
GigabitEthernet0/1	192.168.2.1	YES	manual	up	up
Serial0/0/0	10.100.100.1	YES	manual	up	up
Serial0/0/1	10.100.100.10	YES	manual	up	up

R1#**show ip route static**

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  
i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  
a - application route  
+ - replicated route, % - next hop override

Gateway of last resort is 10.100.100.9 to network 0.0.0.0

```
S* 0.0.0.0/0 [1/0] via 10.100.100.9
S 192.168.3.0/24 [1/0] via 10.100.100.2
S 192.168.4.0/24 [1/0] via 10.100.100.2
S 192.168.5.0/24 [1/0] via 10.100.100.9
S 192.168.6.0/24 [1/0] via 10.100.100.9
```

R1#**show cdp neighbors**

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge  
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,  
D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW1	Gig 0/0	149	S I	WS-C3560-	Fas 0/23
SW2	Gig 0/1	135	S I	WS-C2960-	Fas 0/23
r2	Ser 0/0/0	134	R B S I	CISCO1941	Ser 0/0/1
R3	Ser 0/0/1	160	R B S I	CISCO1941	Ser 0/0/0

Total cdp entries displayed : 4

→ R2 :

```
r2>en
r2#conf t
r2(config)#int s0/0/0
r2(config-if)#ip address 10.100.100.5 255.255.255.252
r2(config-if)#no shutdown
r2(config-if)#exit
r2(config)#int s0/0/1
r2(config-if)#ip address 10.100.100.2 255.255.255.252
r2(config-if)#no shutdown
r2(config-if)#exit
r2(config)#int g0/1
r2(config-if)#ip address 192.168.4.1 255.255.255.0
r2(config-if)#no shut
```

```

r2(config-if)#exit
r2(config)#int g0/0
r2(config-if)#ip address 192.168.3.1 255.255.255.0
r2(config-if)#no shut
r2(config)#ip route 192.168.5.0 255.255.255.0 10.100.100.6
r2(config)#ip route 192.168.6.0 255.255.255.0 10.100.100.6
r2(config)#ip route 192.168.2.0 255.255.255.0 10.100.100.1
r2(config)#ip route 192.168.1.0 255.255.255.0 10.100.100.1
r2(config)#ip route 0.0.0.0 0.0.0.0 10.100.100.6 5
r2(config)#ip route 0.0.0.0 0.0.0.0 10.100.100.1 5
r2(config)#end

```

**r2#show ip interface brief**

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0	192.168.3.1	YES	manual	up	up
GigabitEthernet0/1	192.168.4.1	YES	manual	down	down
Serial0/0/0	10.100.100.5	YES	manual	up	up
Serial0/0/1	10.100.100.2	YES	manual	up	up

**r2#show ip route static**

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  
i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  
a - application route  
+ - replicated route, % - next hop override

Gateway of last resort is 10.100.100.6 to network 0.0.0.0

```

S* 0.0.0.0/0 [1/0] via 10.100.100.6
S 192.168.1.0/24 [1/0] via 10.100.100.1
S 192.168.2.0/24 [1/0] via 10.100.100.1
S 192.168.5.0/24 [1/0] via 10.100.100.6
S 192.168.6.0/24 [1/0] via 10.100.100.6

```

**r2#show cdp neighbors**

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge  
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,  
D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
-----------	---------------	---------	------------	----------	---------

Switch	Gig 0/0	175	S I WS-C2960- Fas 0/23
R3	Ser 0/0/0	155	R B S I CISCO1941 Ser 0/0/1
R1	Ser 0/0/1	158	R B S I CISCO1941 Ser 0/0/0

Total cdp entries displayed : 3

→ R3 :

```
Router>en
Router#conf t
Router(config)#ho R3
R3(config)#exit
R3#conf t
R3(config)#int s0/0/0
R3(config-if)#ip address 10.100.100.9 255.255.255.252
R3(config-if)#no shut
R3(config-if)#exit
R3(config-if)#ip address 10.100.100.6 255.255.255.252
R3(config-if)#no shut
R3(config-if)#exit
R3(config)#int g0/0
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#exit
R3(config)#int g0/1
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#exit
R3(config)#
R3(config)#ip route 192.168.4.0 255.255.255.0 10.100.100.5
R3(config)#ip route 192.168.4.0 255.255.255.0 10.100.100.5
R3(config)#ip route 192.168.3.0 255.255.255.0 10.100.100.10
R3(config)#ip route 192.168.2.0 255.255.255.0 10.100.100.10
R3(config)#ip route 0.0.0.0 0.0.0.0 10.100.100.5
R3(config)#ip route 0.0.0.0 0.0.0.0 10.100.100.10 5
R3(config)#exit
```

R3#show ip interface brief

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0	192.168.5.1	YES	manual	up	up
GigabitEthernet0/1	192.168.6.1	YES	manual	up	up
Serial0/0/0	10.100.100.9	YES	manual	up	up
Serial0/0/1	10.100.100.6	YES	manual	up	up

R3#show ip route static

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

i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP  
 a - application route  
 + - replicated route, % - next hop override

Gateway of last resort is 10.100.100.5 to network 0.0.0.0

```
S* 0.0.0.0/0 [1/0] via 10.100.100.5
S 192.168.1.0/24 [1/0] via 10.100.100.10
S 192.168.2.0/24 [1/0] via 10.100.100.10
S 192.168.3.0/24 [1/0] via 10.100.100.5
S 192.168.4.0/24 [1/0] via 10.100.100.5
```

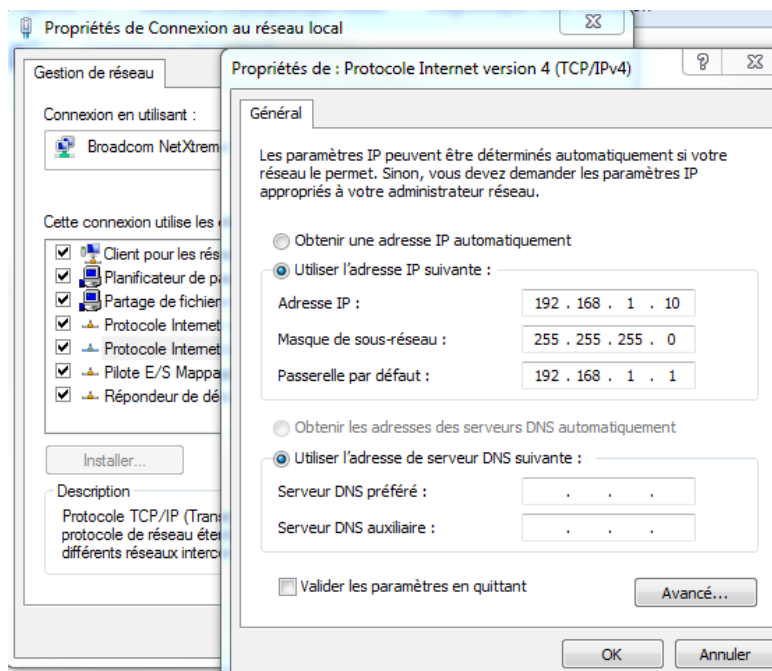
### R3#show cdp neighbors

Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge  
 S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone,  
 D - Remote, C - CVTA, M - Two-port Mac Relay

Device ID	Local Intrfce	Holdtme	Capability	Platform	Port ID
SW5	Gig 0/0	131	S I	WS-C2960+	Fas 0/23
Switch	Gig 0/1	168	S I	WS-C2960+	Fas 0/23
r2	Ser 0/0/1	150	R B S I	CISCO1941	Ser 0/0/0
R1	Ser 0/0/0	161	R B S I	CISCO1941	Ser 0/0/1

Total cdp entries displayed : 4

### Configuration d'un pc :



Commande tracert :

```
C:\Windows\system32\cmd.exe
Microsoft Windows [version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. Tous droits réservés.

C:\Users\admin>tracert 192.168.6.11

Détermination de l'itinéraire vers 192.168.6.11 avec un maximum de 30 sauts.

  1  <1 ms    <1 ms    <1 ms    192.168.1.1
  2   1 ms    1 ms     1 ms    10.100.100.9
  3   2 ms    1 ms     1 ms    192.168.6.11

Itinéraire déterminé.

C:\Users\admin>
```

R3>en

R3#conf t

R3(config)#int s0/0/0

R3(config-if)#shutdown

\*Mar 26 20:41:58.227: %LINK-5-CHANGED: Interface Serial0/0/0, changed state to administratively down

\*Mar 26 20:41:59.227: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to **down**

```
C:\Users\admin>tracert 192.168.6.11

Détermination de l'itinéraire vers 192.168.6.11 avec un maximum de 30 sauts.

  1  <1 ms    <1 ms    <1 ms    192.168.1.1
  2   1 ms    1 ms     1 ms    10.100.100.2
  3   2 ms    1 ms     1 ms    10.100.100.6
  4   2 ms    2 ms     2 ms    192.168.6.11

Itinéraire déterminé.

C:\Users\admin>
```

R3(config-if)#no shut

\*Mar 26 20:42:54.067: %LINK-3-UPDOWN: Interface Serial0/0/0, changed state to up

\*Mar 26 20:42:55.067: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to **up**

R3(config-if)#exit

Conclusion :

**On remarque qu'avec la commande « shutdown » l'itinéraire diffère de la première commande « tracert » et ainsi, on arrive à atteindre le réseau voulu grâce à un chemin de secours.**

### Trace route :

```
r2#traceroute 192.168.1.10
Type escape sequence to abort.
Tracing the route to 192.168.1.10
VRF info: (vrf in name/id, vrf out name/id)
  1 10.100.100.1 0 msec 0 msec 0 msec
  2 192.168.1.10 0 msec 0 msec 0 msec
r2#
```

### Configuration ssh routeur :

```
R3(config)#line con 0
R3(config-line)#password class
R3(config-line)#login
R3(config-line)#service password-encryption
R3(config)#enable secret cisco
R3(config)#ip domain-name depinfo.touchard.edu
R3(config)#crypto key generate rsa
The name for the keys will be: R3.depinfo.touchard.edu
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.
```

How many bits in the modulus [512]: **1024**  
% Generating 1024 bit RSA keys, keys will be non-exportable...  
[OK] (elapsed time was 5 seconds)

```
*Mar 26 20:46:43.595: %SSH-5-ENABLED: SSH 1.99 has been enabled
R3(config)#username admin password cisco
R3(config)#line vty 0 4
R3(config-line)#transport input ssh
R3(config-line)#login local
R3(config-line)#exit
R3(config)#exit
R3#exit
*Mar 26 20:47:13.695: %SYS-5-CONFIG_I: Configured from console by console
```

### Configuration ssh switch :

```
Switch>en
Switch#config t
Switch(config)#interface vlan 1
Switch(config-if)#ip address 192.168.3.254 255.255.255.0
Switch(config-if)#no shut
Switch(config-if)#exit
Switch(config)#ip default-gateway 192.168.3.1
Switch(config)#exit
Switch(config)#ho SW3
SW3(config)#ip domain-name depinfo.touchard.edu
SW3(config)#crypto key generate rsa
```



The name for the keys will be: SW5.depinfo.touchard.edu  
Choose the size of the key modulus in the range of 360 to 4096 for your  
General Purpose Keys. Choosing a key modulus greater than 512 may take  
a few minutes.

How many bits in the modulus [512]: **1024**  
% Generating 1024 bit RSA keys, keys will be non-exportable...  
[OK] (elapsed time was 4 seconds)

```
SW3(config)#  
SW3(config)#username admin password cisco  
SW3(config)#line vty 0 4  
SW3(config-line)#login local  
SW3(config-line)#transport input ssh  
SW3(config)#ip ssh time-out 60  
SW3(config)#ip ssh authentication-retries 3
```