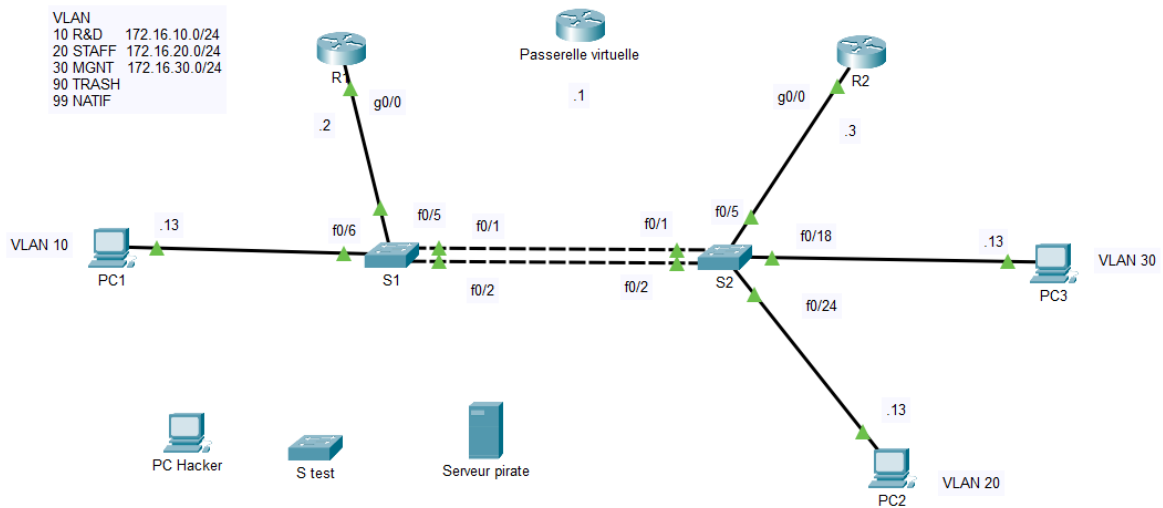
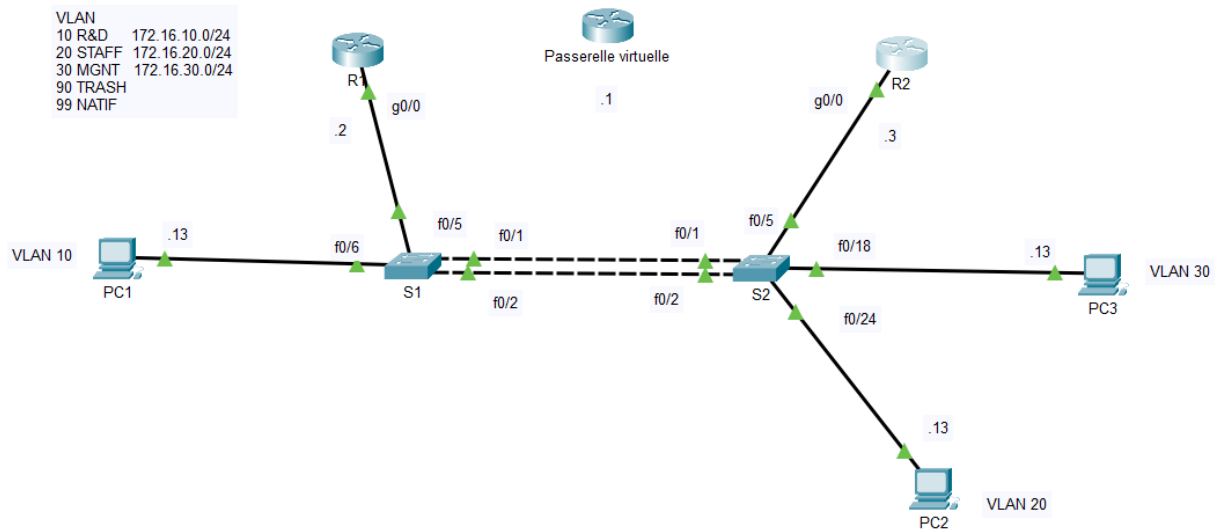


Labo Sécurité



ipconfig sur pc1 :

```
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::202:4AFF:FE11:E1B9
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 172.16.10.11
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                   172.16.10.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                   0.0.0.0

C:\>
```

ipconfig sur pc2:

```
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::20C:CFFF:FEC7:6C7B
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 172.16.20.11
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                   172.16.20.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                   0.0.0.0

C:\>
```

ipconfig sur pc3 :

```
C:\>ipconfig

FastEthernet0 Connection: (default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: FE80::230:A3FF:FE7C:2C8C
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 172.16.30.129
    Subnet Mask . . . . .: 255.255.255.0
    Default Gateway . . . . .: ::
                                   172.16.30.1

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address . . . . .: ::
    IPv6 Address . . . . .: ::
    IPv4 Address . . . . .: 0.0.0.0
    Subnet Mask . . . . .: 0.0.0.0
    Default Gateway . . . . .: ::
                                   0.0.0.0

C:\>
```

ping depuis PC1 vers PC2

```
C:\>ping 172.16.20.11

Pinging 172.16.20.11 with 32 bytes of data:

Reply from 172.16.20.11: bytes=32 time<1ms TTL=127
Reply from 172.16.20.11: bytes=32 time<1ms TTL=127
Reply from 172.16.20.11: bytes=32 time=10ms TTL=127
Reply from 172.16.20.11: bytes=32 time<1ms TTL=127

Ping statistics for 172.16.20.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms

C:\>
```

ping depuis PC1 vers PC3

```
C:\>ping 172.16.30.129

Pinging 172.16.30.129 with 32 bytes of data:

Reply from 172.16.30.129: bytes=32 time=6ms TTL=127
Reply from 172.16.30.129: bytes=32 time<1ms TTL=127
Reply from 172.16.30.129: bytes=32 time<1ms TTL=127
Reply from 172.16.30.129: bytes=32 time=1ms TTL=127

Ping statistics for 172.16.30.129:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 6ms, Average = 1ms

C:\>|
```

ping depuis PC1 vers s1

```
C:\>ping 172.16.30.11

Pinging 172.16.30.11 with 32 bytes of data:

Reply from 172.16.30.11: bytes=32 time<1ms TTL=254
Reply from 172.16.30.11: bytes=32 time<1ms TTL=254
Reply from 172.16.30.11: bytes=32 time=1ms TTL=254
Reply from 172.16.30.11: bytes=32 time<1ms TTL=254

Ping statistics for 172.16.30.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

ping depuis PC1 vers s2

```
C:\>ping 172.16.30.12

Pinging 172.16.30.12 with 32 bytes of data:

Reply from 172.16.30.12: bytes=32 time=1ms TTL=254
Reply from 172.16.30.12: bytes=32 time<1ms TTL=254
Reply from 172.16.30.12: bytes=32 time<1ms TTL=254
Reply from 172.16.30.12: bytes=32 time=11ms TTL=254

Ping statistics for 172.16.30.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 3ms

C:\>
```

ping depuis PC1 vers R1

```
C:\>ping 172.16.10.2

Pinging 172.16.10.2 with 32 bytes of data:

Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255
Reply from 172.16.10.2: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```

ping depuis PC1 vers R2

```
C:\>ping 172.16.10.3

Pinging 172.16.10.3 with 32 bytes of data:

Reply from 172.16.10.3: bytes=32 time<1ms TTL=255
Reply from 172.16.10.3: bytes=32 time<1ms TTL=255
Reply from 172.16.10.3: bytes=32 time<1ms TTL=255
Reply from 172.16.10.3: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

ping depuis PC1 vers la passerelle virtuelle (HSRP)

```
C:\>ping 172.16.10.1

Pinging 172.16.10.1 with 32 bytes of data:

Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```

ping depuis PC2 vers PC1

```
C:\>ping 172.16.10.11

Pinging 172.16.10.11 with 32 bytes of data:

Reply from 172.16.10.11: bytes=32 time<1ms TTL=127
Reply from 172.16.10.11: bytes=32 time=20ms TTL=127
Reply from 172.16.10.11: bytes=32 time=1ms TTL=127
Reply from 172.16.10.11: bytes=32 time<1ms TTL=127

Ping statistics for 172.16.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 20ms, Average = 5ms

C:\>
```

ping depuis PC2 vers PC3

```
C:\>ping 172.16.30.129

Pinging 172.16.30.129 with 32 bytes of data:

Reply from 172.16.30.129: bytes=32 time<1ms TTL=127
Reply from 172.16.30.129: bytes=32 time=10ms TTL=127
Reply from 172.16.30.129: bytes=32 time=11ms TTL=127
Reply from 172.16.30.129: bytes=32 time=1ms TTL=127

Ping statistics for 172.16.30.129:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms

C:\>|
```

ping depuis PC2 vers S1

```
C:\>ping 172.16.30.11

Pinging 172.16.30.11 with 32 bytes of data:

Reply from 172.16.30.11: bytes=32 time<1ms TTL=254
Reply from 172.16.30.11: bytes=32 time=1ms TTL=254
Reply from 172.16.30.11: bytes=32 time<1ms TTL=254
Reply from 172.16.30.11: bytes=32 time<1ms TTL=254

Ping statistics for 172.16.30.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

ping depuis PC2 vers S2

```
C:\>ping 172.16.30.12

Pinging 172.16.30.12 with 32 bytes of data:

Reply from 172.16.30.12: bytes=32 time=1ms TTL=254
Reply from 172.16.30.12: bytes=32 time=11ms TTL=254
Reply from 172.16.30.12: bytes=32 time=1ms TTL=254
Reply from 172.16.30.12: bytes=32 time=11ms TTL=254

Ping statistics for 172.16.30.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 11ms, Average = 6ms

C:\>
```

ping depuis PC2 vers la passerelle virtuelle (HSRP)

```
C:\>ping 172.16.20.1

Pinging 172.16.20.1 with 32 bytes of data:

Reply from 172.16.20.1: bytes=32 time<1ms TTL=255
Reply from 172.16.20.1: bytes=32 time<1ms TTL=255
Reply from 172.16.20.1: bytes=32 time<1ms TTL=255
Reply from 172.16.20.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>|
```

ping depuis PC2 vers R1

```
C:\>ping 172.16.20.2

Pinging 172.16.20.2 with 32 bytes of data:

Reply from 172.16.20.2: bytes=32 time<1ms TTL=255
Reply from 172.16.20.2: bytes=32 time=1ms TTL=255
Reply from 172.16.20.2: bytes=32 time=1ms TTL=255
Reply from 172.16.20.2: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

ping depuis PC2 vers R2

```
C:\>ping 172.16.20.3

Pinging 172.16.20.3 with 32 bytes of data:

Reply from 172.16.20.3: bytes=32 time<1ms TTL=255
Reply from 172.16.20.3: bytes=32 time=1ms TTL=255
Reply from 172.16.20.3: bytes=32 time<1ms TTL=255
Reply from 172.16.20.3: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

ping depuis PC3 vers PC1

```
C:\>ping 172.16.10.11

Pinging 172.16.10.11 with 32 bytes of data:

Reply from 172.16.10.11: bytes=32 time=1ms TTL=127
Reply from 172.16.10.11: bytes=32 time<1ms TTL=127
Reply from 172.16.10.11: bytes=32 time=1ms TTL=127
Reply from 172.16.10.11: bytes=32 time=1ms TTL=127

Ping statistics for 172.16.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

ping depuis PC3 vers PC2

```
C:\>ping 172.16.20.11

Pinging 172.16.20.11 with 32 bytes of data:

Reply from 172.16.20.11: bytes=32 time<1ms TTL=127
Reply from 172.16.20.11: bytes=32 time=2ms TTL=127
Reply from 172.16.20.11: bytes=32 time=10ms TTL=127
Reply from 172.16.20.11: bytes=32 time=1ms TTL=127

Ping statistics for 172.16.20.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 3ms

C:\>
```

ping depuis PC3 vers s1

```
C:\>ping 172.16.30.11

Pinging 172.16.30.11 with 32 bytes of data:

Reply from 172.16.30.11: bytes=32 time<1ms TTL=255
Reply from 172.16.30.11: bytes=32 time=1ms TTL=255
Reply from 172.16.30.11: bytes=32 time<1ms TTL=255
Reply from 172.16.30.11: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.30.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

ping depuis PC3 vers s2

```
C:\>ping 172.16.30.12

Pinging 172.16.30.12 with 32 bytes of data:

Reply from 172.16.30.12: bytes=32 time<1ms TTL=255
Reply from 172.16.30.12: bytes=32 time<1ms TTL=255
Reply from 172.16.30.12: bytes=32 time<1ms TTL=255
Reply from 172.16.30.12: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.30.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

ping depuis PC3 vers R1

```
C:\>ping 172.16.30.2

Pinging 172.16.30.2 with 32 bytes of data:

Reply from 172.16.30.2: bytes=32 time<1ms TTL=255
Reply from 172.16.30.2: bytes=32 time<1ms TTL=255
Reply from 172.16.30.2: bytes=32 time<1ms TTL=255
Reply from 172.16.30.2: bytes=32 time=2ms TTL=255

Ping statistics for 172.16.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>
```

ping depuis PC3 vers R2

```
C:\>ping 172.16.30.3

Pinging 172.16.30.3 with 32 bytes of data:

Reply from 172.16.30.3: bytes=32 time<1ms TTL=255
Reply from 172.16.30.3: bytes=32 time<1ms TTL=255
Reply from 172.16.30.3: bytes=32 time<1ms TTL=255
Reply from 172.16.30.3: bytes=32 time=1ms TTL=255

Ping statistics for 172.16.30.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

ping depuis PC3 vers la passerelle virtuelle (HSRP)

```
C:\>ping 172.16.30.1

Pinging 172.16.30.1 with 32 bytes of data:

Reply from 172.16.30.1: bytes=32 time<1ms TTL=255
Reply from 172.16.30.1: bytes=32 time<1ms TTL=255
Reply from 172.16.30.1: bytes=32 time=1ms TTL=255
Reply from 172.16.30.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.30.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

test de l'accès Management SSH sur PC2 :

```
C:\>ssh -l admin 172.16.30.1

Password:

Acces reserve aux administrateurs !

R1>
```

show etherchannel summary sur S1 :

```
S1>sh eth sum
Flags:  D - down          P - in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        U - in use       f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port
```

```
Number of channel-groups in use: 1
Number of aggregators:           1
```

Group	Port-channel	Protocol	Ports
1	Pol(SU)	PAgP	Fa0/1(P) Fa0/2(P)

```
S1>
```

show etherchannel summary sur S2 :

```
S2>sh eth sum
Flags:  D - down          P - in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        U - in use       f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port
```

```
Number of channel-groups in use: 1
Number of aggregators:           1
```

Group	Port-channel	Protocol	Ports
1	Pol(SU)	PAgP	Fa0/1(P) Fa0/2(P)

```
S2>
```

show interfaces trunk sur S1 :

```
S1>show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Po1       on        802.1q         trunking    99
Fa0/5     on        802.1q         trunking    99

Port      Vlans allowed on trunk
Po1       1-1005
Fa0/5     1-1005

Port      Vlans allowed and active in management domain
Po1       1,10,20,30,90,99
Fa0/5     1,10,20,30,90,99

Port      Vlans in spanning tree forwarding state and not pruned
Po1       1,10,20,30,90,99
Fa0/5     1,10,20,30,90,99

S1>
```

show interfaces trunk sur S2 :

```
S2>show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Po1       on        802.1q         trunking    99
Fa0/5     on        802.1q         trunking    99

Port      Vlans allowed on trunk
Po1       1-1005
Fa0/5     1-1005

Port      Vlans allowed and active in management domain
Po1       1,10,20,30,90,99
Fa0/5     1,10,20,30,90,99

Port      Vlans in spanning tree forwarding state and not pruned
Po1       1,10,20,30,90,99
Fa0/5     1,10,20,30,90,99

S2>
```

show vlan brief sur S1 :

```
S1>show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/18, Fa0/24, Gig0/1, Gig0/2
10	R&D	active	Fa0/6
20	STAFF	active	
30	MGNT	active	
90	TRASH	active	Fa0/3, Fa0/4, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/19, Fa0/20, Fa0/21 Fa0/22, Fa0/23
99	NATIF	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

S1>

show vlan brief sur S2 :

```
S2>show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/6, Gig0/1, Gig0/2
10	R&D	active	
20	STAFF	active	Fa0/24
30	MGNT	active	Fa0/18
90	TRASH	active	Fa0/3, Fa0/4, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/19, Fa0/20, Fa0/21 Fa0/22, Fa0/23
99	NATIF	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

S2>

sh ip int br sur S1 :

```
S1>sh ip int br
Interface      IP-Address      OK? Method Status      Protocol
Port-channel1  unassigned      YES manual  up          up
FastEthernet0/1 unassigned      YES manual  up          up
FastEthernet0/2 unassigned      YES manual  up          up
FastEthernet0/3 unassigned      YES manual  administratively down down
FastEthernet0/4 unassigned      YES manual  administratively down down
FastEthernet0/5 unassigned      YES manual  up          up
FastEthernet0/6 unassigned      YES manual  up          up
FastEthernet0/7 unassigned      YES manual  administratively down down
FastEthernet0/8 unassigned      YES manual  administratively down down
FastEthernet0/9 unassigned      YES manual  administratively down down
FastEthernet0/10 unassigned      YES manual  administratively down down
FastEthernet0/11 unassigned      YES manual  administratively down down
FastEthernet0/12 unassigned      YES manual  administratively down down
FastEthernet0/13 unassigned      YES manual  administratively down down
FastEthernet0/14 unassigned      YES manual  administratively down down
FastEthernet0/15 unassigned      YES manual  administratively down down
FastEthernet0/16 unassigned      YES manual  administratively down down
FastEthernet0/17 unassigned      YES manual  administratively down down
FastEthernet0/18 unassigned      YES manual  down        down
FastEthernet0/19 unassigned      YES manual  administratively down down
FastEthernet0/20 unassigned      YES manual  administratively down down
FastEthernet0/21 unassigned      YES manual  administratively down down
FastEthernet0/22 unassigned      YES manual  administratively down down
FastEthernet0/23 unassigned      YES manual  administratively down down
FastEthernet0/24 unassigned      YES manual  down        down
GigabitEthernet0/1 unassigned      YES manual  down        down
GigabitEthernet0/2 unassigned      YES manual  down        down
Vlan1          unassigned      YES manual  administratively down down
Vlan30         172.16.30.11   YES manual  up          up
S1>
```

sh ip int br sur S2:

```
S2>sh ip int br
Interface IP-Address OK? Method Status Protocol
Port-channel1 unassigned YES manual up up
FastEthernet0/1 unassigned YES manual up up
FastEthernet0/2 unassigned YES manual up up
FastEthernet0/3 unassigned YES manual administratively down down
FastEthernet0/4 unassigned YES manual administratively down down
FastEthernet0/5 unassigned YES manual up up
FastEthernet0/6 unassigned YES manual down down
FastEthernet0/7 unassigned YES manual administratively down down
FastEthernet0/8 unassigned YES manual administratively down down
FastEthernet0/9 unassigned YES manual administratively down down
FastEthernet0/10 unassigned YES manual administratively down down
FastEthernet0/11 unassigned YES manual administratively down down
FastEthernet0/12 unassigned YES manual administratively down down
FastEthernet0/13 unassigned YES manual administratively down down
FastEthernet0/14 unassigned YES manual administratively down down
FastEthernet0/15 unassigned YES manual administratively down down
FastEthernet0/16 unassigned YES manual administratively down down
FastEthernet0/17 unassigned YES manual administratively down down
FastEthernet0/18 unassigned YES manual up up
FastEthernet0/19 unassigned YES manual administratively down down
FastEthernet0/20 unassigned YES manual administratively down down
FastEthernet0/21 unassigned YES manual administratively down down
FastEthernet0/22 unassigned YES manual administratively down down
FastEthernet0/23 unassigned YES manual administratively down down
FastEthernet0/24 unassigned YES manual up up
GigabitEthernet0/1 unassigned YES manual down down
GigabitEthernet0/2 unassigned YES manual down down
Vlan1 unassigned YES manual administratively down down
Vlan30 172.16.30.12 YES manual up up
S2>
```

sh ip inter br sur R1

```
R1>sh ip int br
Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 unassigned YES unset up up
GigabitEthernet0/0.10 172.16.10.2 YES manual up up
GigabitEthernet0/0.20 172.16.20.2 YES manual up up
GigabitEthernet0/0.30 172.16.30.2 YES manual up up
GigabitEthernet0/0.99 172.16.99.2 YES manual up up
GigabitEthernet0/1 unassigned YES unset administratively down down
Vlan1 unassigned YES unset administratively down down
R1>
```

sh ip route sur R1

```
R1>sh 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

    172.16.0.0/16 is variably subnetted, 8 subnets, 2 masks
C       172.16.10.0/24 is directly connected, GigabitEthernet0/0.10
L       172.16.10.2/32 is directly connected, GigabitEthernet0/0.10
C       172.16.20.0/24 is directly connected, GigabitEthernet0/0.20
L       172.16.20.2/32 is directly connected, GigabitEthernet0/0.20
C       172.16.30.0/24 is directly connected, GigabitEthernet0/0.30
L       172.16.30.2/32 is directly connected, GigabitEthernet0/0.30
C       172.16.99.0/24 is directly connected, GigabitEthernet0/0.99
L       172.16.99.2/32 is directly connected, GigabitEthernet0/0.99

R1>
```

sh ip dhcp binding sur R1

```
R1>sh ip dhcp binding
IP address      Client-ID/      Lease expiration        Type
                Hardware address
172.16.10.11    0002.4A11.E1B9  --                       Automatic
172.16.20.11    000C.CFC7.6C7B  --                       Automatic
172.16.30.129   0030.A37C.2C8C  --                       Automatic

R1>
```

sh standby brief sur R1

```
R1#show standby brief
                P indicates configured to preempt.
                |
Interface  Grp  Pri  P State   Active        Standby        Virtual IP
Gig        10   110  P Active   local         172.16.10.3    172.16.10.1
Gig        20   100  Standby  172.16.20.3   local          172.16.20.1
Gig        30   110  P Active   local         172.16.30.3    172.16.30.1
R1#
```

sh ip inter br sur R2

```
R2>sh ip int br
Interface                IP-Address      OK? Method Status        Protocol
GigabitEthernet0/0       unassigned      YES unset  up             up
GigabitEthernet0/0.10    172.16.10.3     YES manual  up             up
GigabitEthernet0/0.20    172.16.20.3     YES manual  up             up
GigabitEthernet0/0.30    172.16.30.3     YES manual  up             up
GigabitEthernet0/0.99    172.16.99.3     YES manual  up             up
GigabitEthernet0/1       unassigned      YES unset  administratively down down
Vlan1                    unassigned      YES unset  administratively down down
R2>
```

sh ip route sur R2

```
R2>sh 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

    172.16.0.0/16 is variably subnetted, 8 subnets, 2 masks
C       172.16.10.0/24 is directly connected, GigabitEthernet0/0.10
L       172.16.10.3/32 is directly connected, GigabitEthernet0/0.10
C       172.16.20.0/24 is directly connected, GigabitEthernet0/0.20
L       172.16.20.3/32 is directly connected, GigabitEthernet0/0.20
C       172.16.30.0/24 is directly connected, GigabitEthernet0/0.30
L       172.16.30.3/32 is directly connected, GigabitEthernet0/0.30
C       172.16.99.0/24 is directly connected, GigabitEthernet0/0.99
L       172.16.99.3/32 is directly connected, GigabitEthernet0/0.99
R2>
```

sh ip dhcp binding sur R2

```
R2>sh ip dhcp binding
IP address      Client-ID/      Lease expiration        Type
                Hardware address
172.16.10.11    0002.4A11.E1B9  --                       Automatic
172.16.20.11    000C.CFC7.6C7B  --                       Automatic
172.16.30.129   0030.A37C.2C8C  --                       Automatic
R2>
```

sh standby brief sur R2

```
R2#sh standby brief
P indicates configured to preempt.
|
Interface    Grp  Pri P State      Active        Standby        Virtual IP
Gig          10   100 Standby    172.16.10.2   local          172.16.10.1
Gig          20   110 P Active    local         172.16.20.2    172.16.20.1
Gig          30   100 Standby    172.16.30.2   local          172.16.30.1
R2#
```

tracert 172.16.10.1 sur pc1

```
C:\>tracert 172.16.10.1

Tracing route to 172.16.10.1 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      172.16.10.1

Trace complete.

C:\>
```

tracert 172.16.10.1 sur pc2

```
C:\>tracert 172.16.10.1

Tracing route to 172.16.10.1 over a maximum of 30 hops:

  1    0 ms      0 ms      0 ms      172.16.20.3
  2    *         1 ms      0 ms      172.16.10.1

Trace complete.

C:\>
```

tracert 172.16.10.1 sur pc3

```
C:\>tracert 172.16.10.1

Tracing route to 172.16.10.1 over a maximum of 30 hops:

  1    0 ms      1 ms      0 ms      172.16.10.1

Trace complete.

C:\>
```

ping depuis PC1 vers la passerelle virtuelle avant enlever le câble

```
C:\>ping -t 172.16.10.1

Pinging 172.16.10.1 with 32 bytes of data:

Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time=1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
```

ping depuis PC1 vers la passerelle virtuelle après enlever le câble

```
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Request timed out.
Request timed out.
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time=1ms TTL=255
Reply from 172.16.10.1: bytes=32 time=1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
```

ping depuis PC1 vers la passerelle virtuelle après reconnecter le câble

```
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Request timed out.
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time=1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time=1ms TTL=255
Reply from 172.16.10.1: bytes=32 time<1ms TTL=255
Reply from 172.16.10.1: bytes=32 time=1ms TTL=255
```

tracert 172.16.10.1 sur pc1 après reconnecter le câble

```
C:\>tracert 172.16.10.1

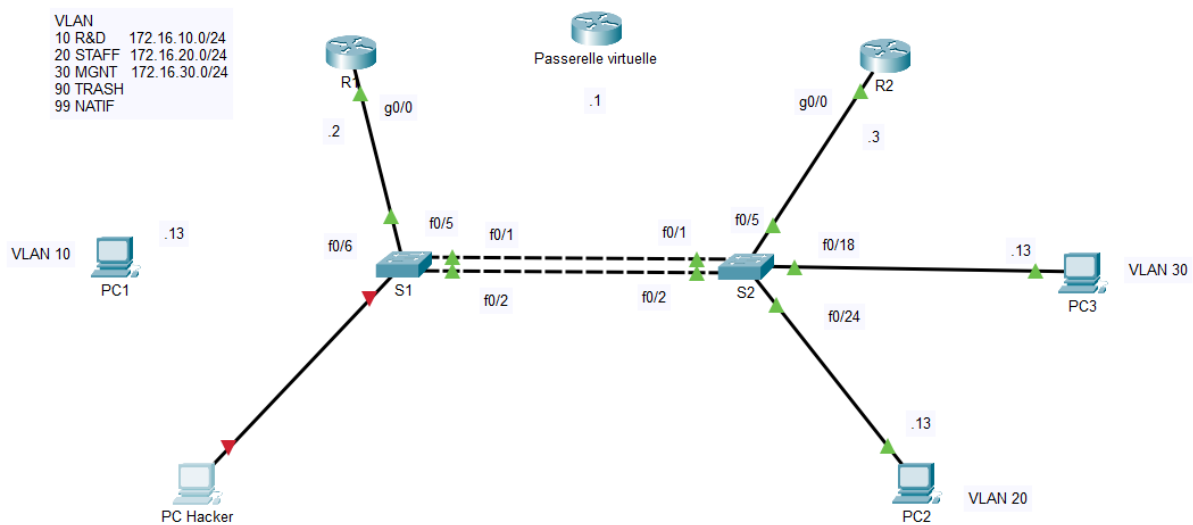
Tracing route to 172.16.10.1 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    172.16.10.1

Trace complete.

C:\>
```

Pc Hacker à la place de PC1 après supprimer le câble de PC1 avec S1 et ajouter une adresse IP sur le PC Hacker



IP Configuration	
Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	172.16.10.50
Subnet Mask	255.255.0.0
Default Gateway	0.0.0.0
DNS Server	0.0.0.0

ping depuis le PC Hacker vers la passerelle

```
C:\>ping 172.16.10.1

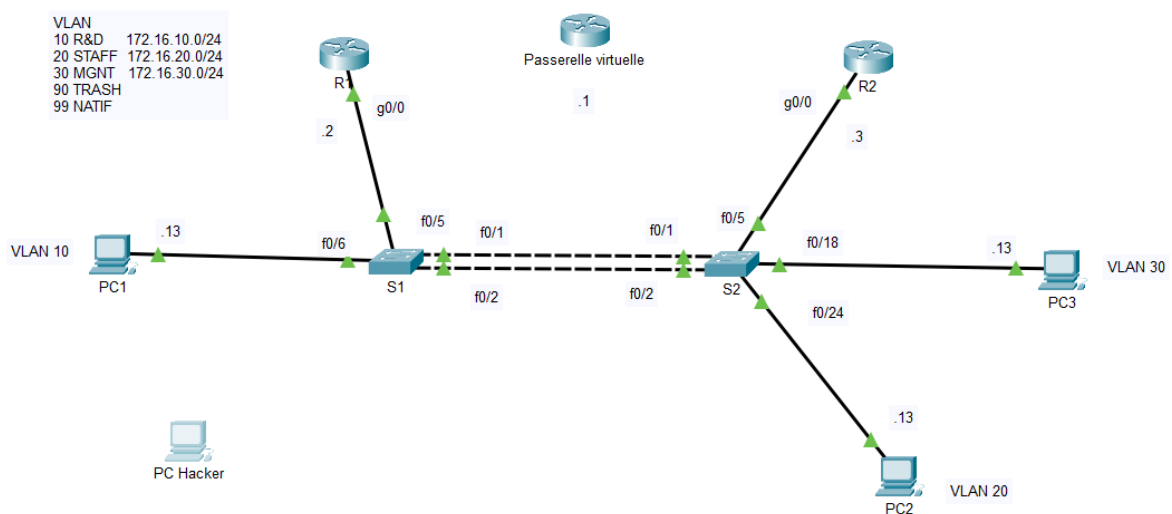
Pinging 172.16.10.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.16.10.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

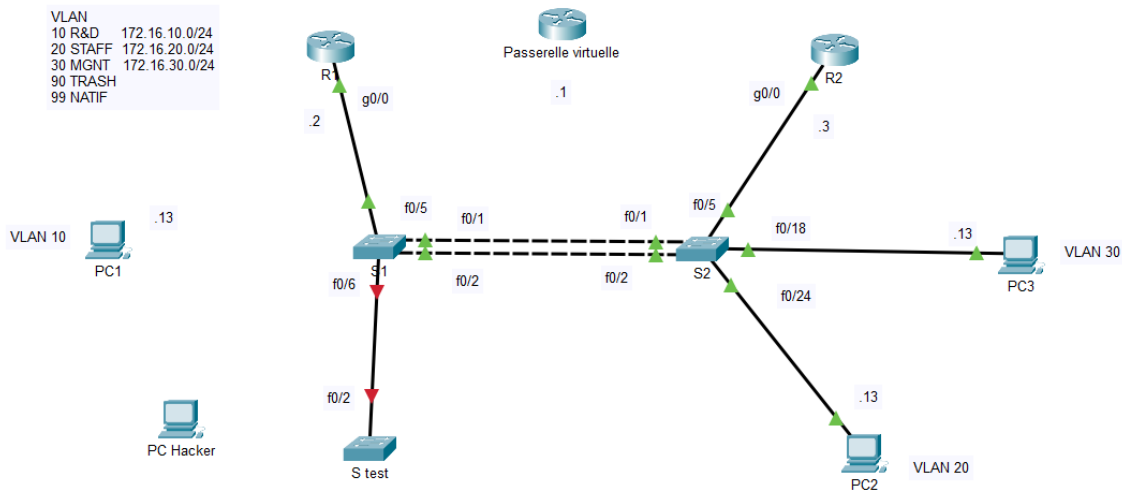
C:\>
```

Reconnecter le câble de PC1



Test du Switch Sauvage (BPDU Guard) :

« Ajout d'un switch à la place d'un des PC afin de tester la sécurité BPDU. En connectant le commutateur "S test" sur le port **f0/6** de S1»



Show interfaces f0/6 status sur S1 :

"Lors du test d'intrusion consistant à remplacer le PC1 par un commutateur non autorisé, l'interface Fa0/6 de S1 est passée immédiatement en état **err-disabled**. Ce mécanisme de protection (BPDU Guard) a permis d'isoler le port dès la réception d'une trame BPDU, empêchant ainsi toute tentative d'extension du réseau non contrôlée ou de création de boucles de commutation."

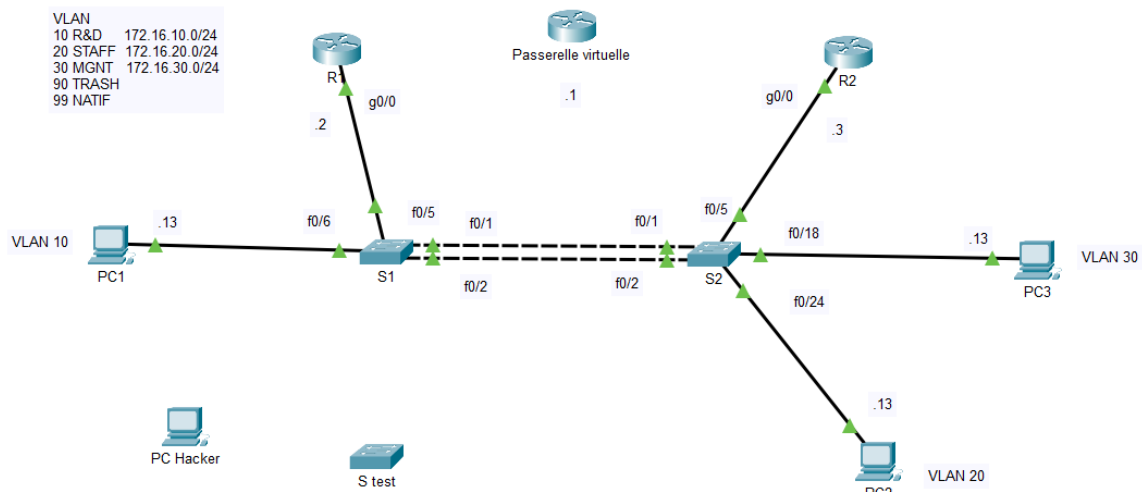
```
S1#show interfaces f0/6 status
Port      Name      Status      Vlan      Duplex  Speed Type
Fa0/6     Name      err-disabled 10        auto     auto  10/100BaseTX

S1#
S1#
```

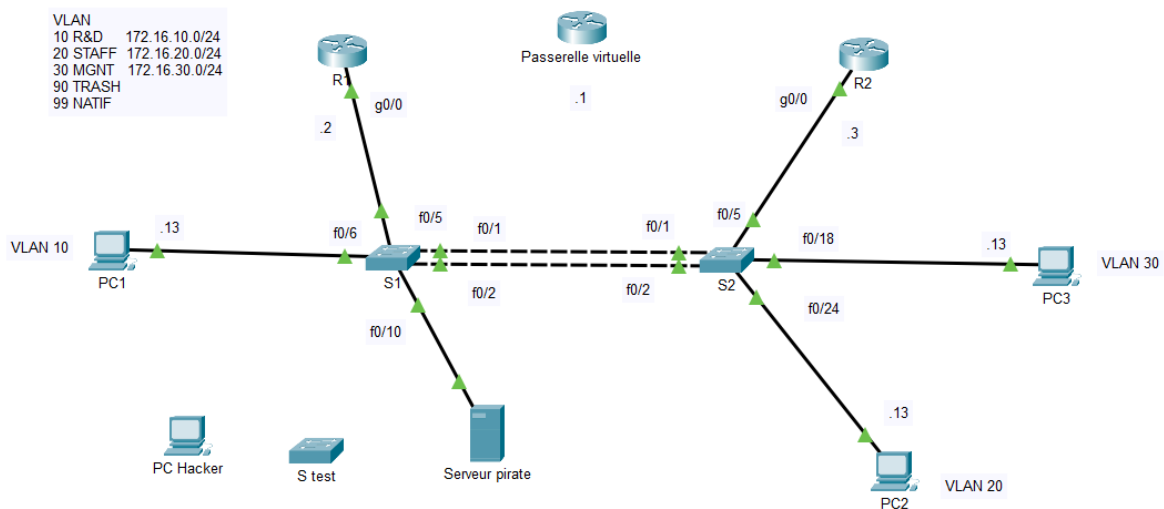
Vérification finale du statut après reconnecter le PC1 :

```
S1#show interfaces f0/6 status
Port      Name      Status      Vlan      Duplex  Speed Type
Fa0/6     Name      connected   10        a-full  a-100 10/100BaseTX

S1#
```



Test du Serveur Pirate (DHCP Snooping) : (ajout de Serveur pirate et configuration de IP adresse et DHCP service)



Configuration IP adresse sur Serveur Pirate :

Serveur pirate

Physical Config Services **Desktop** Programming Attributes

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IPv4 Address: 172.16.10.200

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

Configuration DHCP –Service sur Serveur Pirate :

Serveur pirate

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP
- PRP

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Start IP Address: 172.16.10.201

Subnet Mask: 255.255.255.0

Maximum Number of Users: 55

TFTP Server: 0.0.0.0

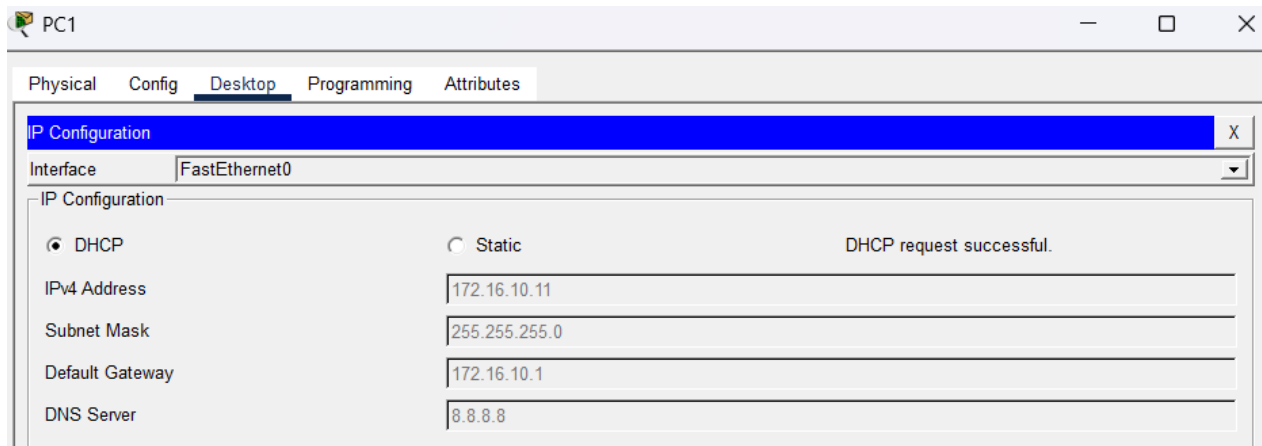
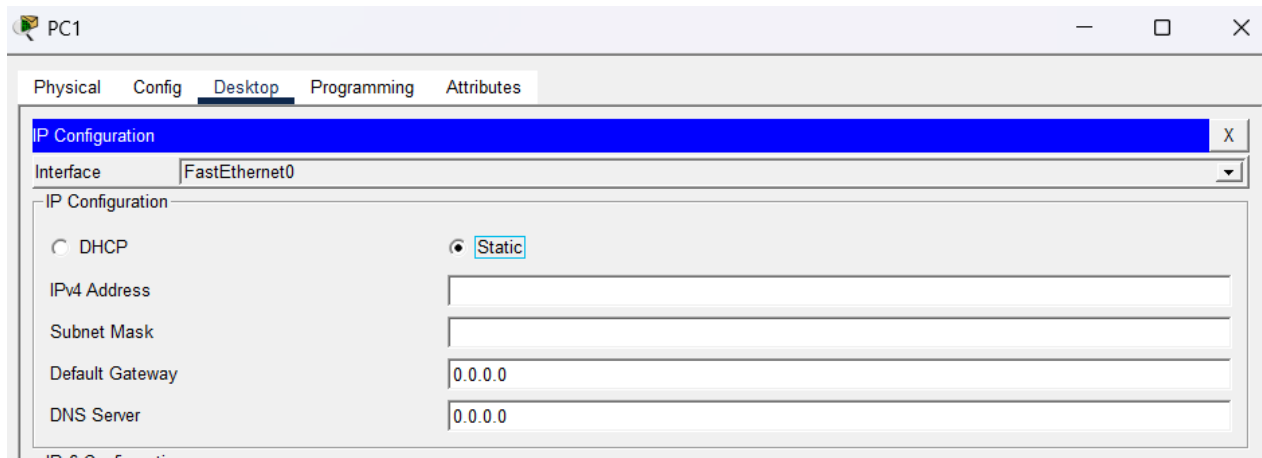
WLC Address: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	0.0.0.0	0.0.0.0	172.16.10.201	255.255.255.0	55	0.0.0.0	0.0.0.0

Test du Serveur Pirate (DHCP Snooping) :

« Pour tester la sécurité, nous avons forcé le renouvellement IP du **PC1** via le mode **Static** puis **DHCP**. Malgré la présence d'un **serveur pirate** actif sur le port **f0/10**, le switch **S1** a bloqué l'offre malveillante. Le PC1 a correctement reçu l'adresse **172.16.10.11** du serveur légitime, prouvant l'efficacité du filtrage sur les ports non fiables. »



show port-security interface f0/6 sur S1

```
S1#show port-security interface
% Incomplete command.
S1#show port-security interface f0/6
Port Security          : Enabled
Port Status            : Secure-up
Violation Mode         : Shutdown
Aging Time             : 60 mins
Aging Type             : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses  : 1
Total MAC Addresses    : 1
Configured MAC Addresses : 0
Sticky MAC Addresses   : 1
Last Source Address:Vlan : 0002.4A11.E1B9:10
Security Violation Count : 0

S1#
```

show ip arp inspection interfaces sur S1

```
S1#show ip arp inspection interfaces
Interface      Trust State      Rate(pps)      Burst Interval
-----
Fa0/1          Trusted          15              1
Fa0/2          Trusted          15              1
Fa0/3          Trusted          15              1
Fa0/4          Trusted          15              1
Fa0/5          Trusted          15              1
Fa0/6          Untrusted        15              1
Fa0/7          Untrusted        15              1
Fa0/8          Untrusted        15              1
Fa0/9          Untrusted        15              1
Fa0/10         Untrusted        15              1
Fa0/11         Untrusted        15              1
Fa0/12         Untrusted        15              1
Fa0/13         Untrusted        15              1
Fa0/14         Untrusted        15              1
Fa0/15         Untrusted        15              1
Fa0/16         Untrusted        15              1
Fa0/17         Untrusted        15              1
Fa0/18         Untrusted        15              1
Fa0/19         Untrusted        15              1
Fa0/20         Untrusted        15              1
Fa0/21         Untrusted        15              1
Fa0/22         Untrusted        15              1
Fa0/23         Untrusted        15              1
Fa0/24         Untrusted        15              1
Gig0/1         Untrusted        15              1
Gig0/2         Untrusted        15              1

S1#
```

show ip dhcp snooping sur S1

```
S1#show ip dhcp snooping
Switch DHCP snooping is enabled
DHCP snooping is configured on following VLANs:
10,20,30
Insertion of option 82 is disabled
Option 82 on untrusted port is not allowed
Verification of hwaddr field is enabled
Interface                Trusted      Rate limit (pps)
-----
Port-channel1            no          unlimited
FastEthernet0/2          yes          unlimited
FastEthernet0/4          yes          unlimited
FastEthernet0/1          yes          unlimited
FastEthernet0/3          yes          unlimited
FastEthernet0/6          no          unlimited
FastEthernet0/5          yes          unlimited
FastEthernet0/10         no          unlimited
S1#
```

show ip dhcp snooping binding sur S1

```
S1#show ip dhcp snooping binding
MacAddress      IpAddress      Lease(sec)  Type           VLAN  Interface
-----
00:02:4A:11:E1:B9  172.16.10.11   0           dhcp-snooping  10    FastEthernet0/6
Total number of bindings: 1
S1#
```

show port-security address sur S1 :

```
S1#show port-security address
          Secure Mac Address Table
-----
Vlan      Mac Address      Type                               Ports    Remaining Age
(mins)
-----
10        0002.4A11.E1B9    SecureSticky                      Fa0/6    -
-----
Total Addresses in System (excluding one mac per port)    : 0
Max Addresses limit in System (excluding one mac per port) : 1024
S1#
S1#
```

show port-security sur S1 :

```
S1#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
              (Count)          (Count)          (Count)
-----
          Fa0/6             1             1             0          Shutdown
-----
S1#
```

show port-security interface f0/24 sur S2

```
S2#show port-security interface f0/24
Port Security           : Enabled
Port Status             : Secure-up
Violation Mode          : Shutdown
Aging Time              : 0 mins
Aging Type              : Absolute
SecureStatic Address Aging : Disabled
Maximum MAC Addresses   : 1
Total MAC Addresses     : 1
Configured MAC Addresses : 0
Sticky MAC Addresses    : 1
Last Source Address:Vlan : 000C.CFC7.6C7B:20
Security Violation Count : 0

S2#
```

Show interfaces f0/24 status sur S2

```
S2#show interfaces f0/24 status
Port      Name      Status      Vlan      Duplex  Speed Type
Fa0/24
S2#
```

show ip dhcp snooping sur S2

```
S2#show ip dhcp snooping
Switch DHCP snooping is enabled
DHCP snooping is configured on following VLANs:
10,20,30
Insertion of option 82 is disabled
Option 82 on untrusted port is not allowed
Verification of hwaddr field is enabled
Interface          Trusted      Rate limit (pps)
-----
FastEthernet0/1    yes         unlimited
FastEthernet0/2    yes         unlimited
FastEthernet0/5    yes         unlimited
S2#
```

show ip dhcp snooping binding sur S2

```
S2#show ip dhcp snooping binding
-----
MacAddress      IpAddress      Lease(sec)  Type           VLAN  Interface
-----
00:0C:CF:C7:6C:7B  172.16.20.11   0           dhcp-snooping  20    FastEthernet0/24
00:30:A3:7C:2C:8C  172.16.30.13   0           dhcp-snooping  30    FastEthernet0/18
Total number of bindings: 2
S2#
```

show ip arp inspection interfaces sur S2

```
S2#show ip arp inspection interfaces
-----
Interface      Trust State      Rate (pps)      Burst Interval
-----
Fa0/1          Trusted          15              1
Fa0/2          Trusted          15              1
Fa0/3          Untrusted        15              1
Fa0/4          Untrusted        15              1
Fa0/5          Trusted          15              1
Fa0/6          Untrusted        15              1
Fa0/7          Untrusted        15              1
Fa0/8          Untrusted        15              1
Fa0/9          Untrusted        15              1
Fa0/10         Untrusted        15              1
Fa0/11         Untrusted        15              1
Fa0/12         Untrusted        15              1
Fa0/13         Untrusted        15              1
Fa0/14         Untrusted        15              1
Fa0/15         Untrusted        15              1
Fa0/16         Untrusted        15              1
Fa0/17         Untrusted        15              1
Fa0/18         Untrusted        15              1
Fa0/19         Untrusted        15              1
Fa0/20         Untrusted        15              1
Fa0/21         Untrusted        15              1
Fa0/22         Untrusted        15              1
Fa0/23         Untrusted        15              1
Fa0/24         Untrusted        15              1
Gig0/1         Untrusted        15              1
Gig0/2         Untrusted        15              1
S2#
```

show port-security address sur S2 :

```
S2#show port-security address
      Secure Mac Address Table
-----
Vlan    Mac Address      Type                Ports    Remaining Age
      (mins)
-----
   30    0030.A37C.2C8C    SecureSticky        Fa0/18    -
   20    000C.CFC7.6C7B    SecureSticky        Fa0/24    -
-----
Total Addresses in System (excluding one mac per port)    : 0
Max Addresses limit in System (excluding one mac per port) : 1024
S2#
```

show port-security sur S2 :

```
S2#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
      (Count)      (Count)      (Count)
-----
      Fa0/18        1          1          0          Shutdown
      Fa0/24        1          1          0          Shutdown
-----
S2#
```