

Activitat 2.1. Enrutament senzill d'VLAN

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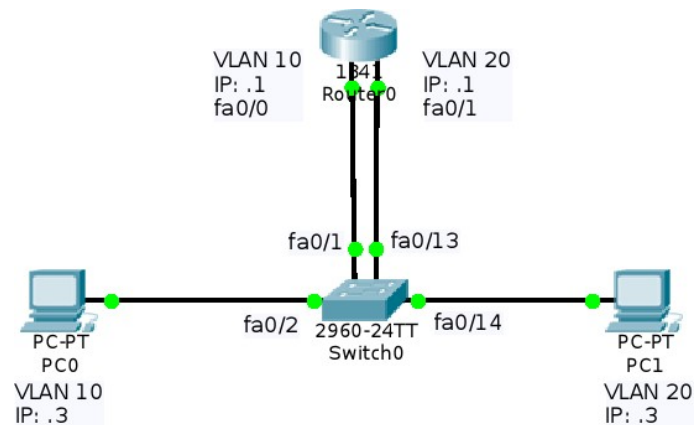
En aquesta pràctica, realitzareu dues configuracions per tal d'enrutar les VLANs d'un mateix switch. La primera configuració la fareu amb dos enllaços normals i la segona la fareu mitjançant un enllaç troncal.

Les dades bàsiques de les VLAN que haureu de configurar en tots dos exercicis són les següents:

- VLAN 10 - V10 - 172.16.10.0/24
- VLAN 20 - V20 - 172.16.20.0/24

Primera Configuració: Enllaços Normals

Donada la següent topologia:



Creeu les VLANs amb les característiques indicades al capdamunt de l'enunciat. Tingueu en compte que els ports es repartiran de la següent manera:

- VLAN 10 - V10: Ports fa0/1 - fa0/12
- VLAN 20 - V20: Ports fa0/13 - fa0/24

Creació VLAN

```
Switch(config)#vlan 10

Switch(config-vlan)#name v10

Switch(config-vlan)#exit

Switch(config)#interface range fastEthernet 0/1-12

Switch(config-if-range)#swit

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#sw

Switch(config-if-range)#switchport access vlan 10

Switch(config-if-range)#exit
```

```
Switch(config)#vlan 20

Switch(config-vlan)#name v20

Switch(config-vlan)#exit

Switch(config)#interface range fastEthernet 0/13-24

Switch(config-if-range)#switchport mode access

Switch(config-if-range)#switchport access vlan 20

Switch(config-if-range)#exit
```

Tanqueu tots els ports del Switch0 que no s'utilitzin.

```
Switch>enable

Switch#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#interface gigabitEthernet 0/1

Switch(config-if)#shutdown

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down

Switch(config-if)#interface gigabitEthernet 0/2

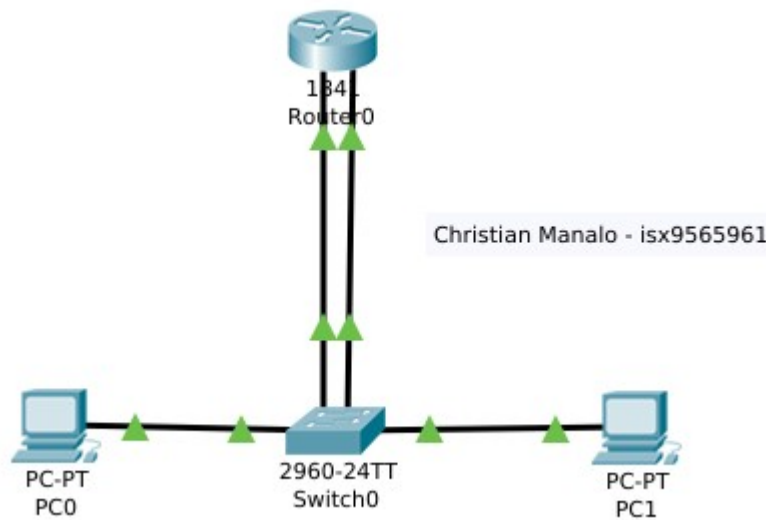
Switch(config-if)#shutdown

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down

Switch(config-if)#
```

Configureu els PCs amb IP estàtica i connecteu-los al Switch0 (connectareu cada PC al 2n port de la VLAN corresponent).

Connecteu el Router0 al Switch0 mitjançant 2 cables Ethernet, un per cada VLAN, tal i com mostra la imatge.



Configureu les interfícies del Router0.

```
Router>enable

Router#conf t

Enter configuration commands, one per line.  End with CNTL/Z.

Router(config)#interf

Router(config)#interface fa

Router(config)#interface fastEthernet 0/0

Router(config-if)#ip address 172.16.10.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit

Router(config)#interface fastEthernet 0/1

Router(config-if)#ip address 172.16.20.1 255.255.255.0

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Router(config-if)#
```

Comproveu que els PCs poden fer ping a la interfície del Router0 corresponent a la seva VLAN.

Poden fer ping a la interfície del router0 corresponent a la seva VLAN pero no pot fer ping a l'altre VLAN.

PC0 - Ping router0 VLAN10

```
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:
```

PC0 - Ping router0 VLAN20

```
C:\>ping 172.16.20.1

Pinging 172.16.20.1 with 32 bytes of data:

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

Ping statistics for 172.16.20.1:

    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

PC1 - Ping router0 VLAN20

```
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 = 1ms, Average = 0ms
```

PC1 - Ping router0 VLAN10

```
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),
```

Comproveu que els PCs, que estan en VLANs diferents, es poden fer ping entre ells.

No tenen connexió.

PC0 – PC1

```
C:\>ping 172.16.20.2
```

```
Pinging 172.16.20.2 with 32 bytes of data:
```

```
Request timed out.
```

```
Request timed out.
```

```
Request timed out.
```

```
Request timed out.
```

```
Ping statistics for 172.16.20.2:
```

```
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Observeu la taula d'enrutament del Router0.

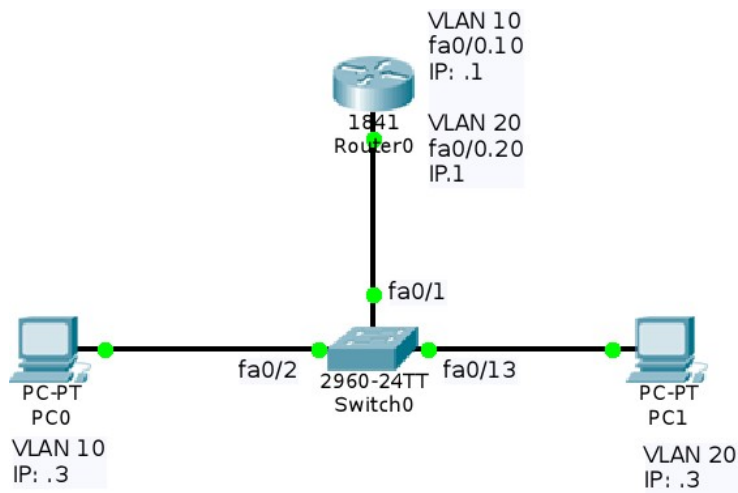
```
172.16.0.0/24 is subnetted, 2 subnets
```

```
C      172.16.10.0 is directly connected, FastEthernet0/0
```

```
C      172.16.20.0 is directly connected, FastEthernet0/1
```

Segona Configuració: Enllaç Troncal

Donada la següent topologia:



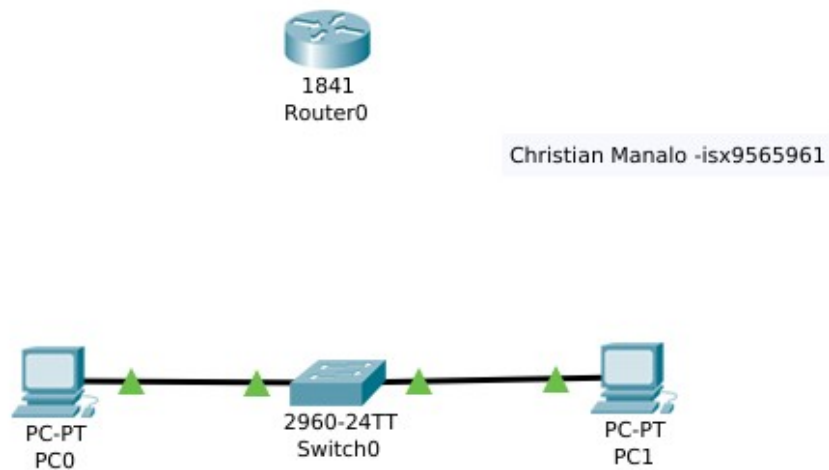
Creeu les VLANs amb les característiques indicades al capdamunt de l'enunciat. Tingueu en compte que els ports es repartiran de la següent manera:

- VLAN 10 - V10: Ports fa0/2 - fa0/12
- VLAN 20 - V20: Ports fa0/13 - fa0/24

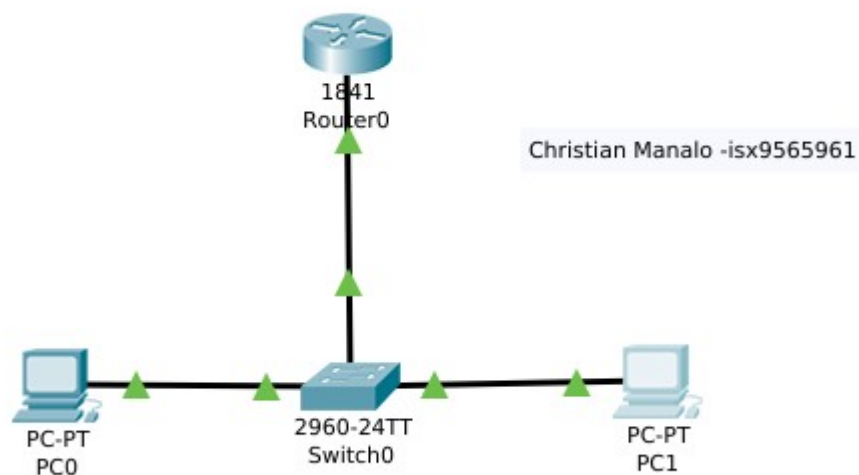
Configureu els PCs amb IP estàtica i connecteu-los al Switch0 utilitzant els ports que indica la imatge.

PC0 – 172.16.10.2 – fa0/2

PC1 – 172.16.20.2 - fa0/13



Connecteu el Router0 al Switch0 mitjançant l'enllaç troncal, tal com mostra la imatge.



Configureu la interfície del Router0 (recordeu que heu d'utilitzar subinterfícies).



```
Router(config)#interface fastEthernet 0/0.10
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 172.16.10.1 255.255.255.0
Router(config-subif)#exit
Router(config)#interface fastEthernet 0/0.20
Router(config-subif)#encapsulation dot1Q 10
Router(config-subif)#ip address 172.16.20.1 255.255.255.0
Router(config)#interface fastEthernet 0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up
```

Creació VLAN

```
Switch(config)#vlan 10
Switch(config-vlan)#name v10
Switch(config-vlan)#exit
Switch(config)#interface range fastEthernet 0/1-12
Switch(config-if-range)#swit
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#sw
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
```

```
Switch(config)#vlan 20
Switch(config-vlan)#name v20
Switch(config-vlan)#exit
Switch(config)#interface range fastEthernet 0/13-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
```

Configureu l'enllaç troncal al port fa0/1 del Switch0 (utilitzen la VLAN 1 com a VLAN Nativa)

```
Switch(config)#interface fastEthernet 0/1
Switch(config-if)#switchport mode trunk
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
Switch(config-if)#switchport trunk native vlan 1
Switch(config-if)#
```

Comproveu que els PCs poden fer ping a la interfície del Router0 corresponent a la seva VLAN.

Poden fer ping a la interfície del router0 corresponent a la seva VLAN pero no pot fer ping a l'altre VLAN.

PC0 - Ping router0 VLAN10

```
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:
```

PC0 - Ping router0 VLAN20

```
C:\>ping 172.16.20.1

Pinging 172.16.20.1 with 32 bytes of data:

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

Ping statistics for 172.16.20.1:

    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

PC1 - Ping router0 VLAN20

```
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 = 1ms, Average = 0ms
```

PC1 - Ping router0 VLAN10

```
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),
```

Comproveu que els PCs, que estan en VLANs diferents, es poden fer ping entre ells.

No tenen connexió.

PC0 – PC1

```
C:\>ping 172.16.20.2

Pinging 172.16.20.2 with 32 bytes of data:

Request timed out.

Request timed out.

Request timed out.

Request timed out.

Ping statistics for 172.16.20.2:

    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Observeu la taula d'enrutament del Router0.

172.16.0.0/24 is subnetted, 2 subnets

C 172.16.10.0 is directly connected, FastEthernet0/0.10

C 172.16.20.0 is directly connected, FastEthernet0/0.20

Activeu i configureu l'accés per Telnet al Router0.

```
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#line vty 0 2
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
```

Comproveu que, des de qualsevol dels dos PCs, podeu accedir a la configuració del Router0 a través del terminal Telnet que acabeu d'activar.

PC0

```
C:\>telnet 172.16.10.1
Trying 172.16.10.1 ...Open
User Access Verification
Password:
Router>
```

PC1

```
C:\>telnet 172.16.20.1
Trying 172.16.20.1 ...Open
User Access Verification
Password:
Router>
```