

Una red LAN está formada por 4 PC conectados a un conmutador capaz de soportar redes VLAN. Se pide:

1. **Crear 2 VLAN.**

VLAN 10:

```
PAR05>enable
PAR05#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
PAR05(config)#vlan 10
PAR05(config-vlan)#name Primera
PAR05(config-vlan)#exit
PAR05(config)#interface fastethernet 0/1
PAR05(config-if)#switchport mode access
PAR05(config-if)#switchport access vlan 10
PAR05(config-if)#exit
PAR05(config)#interface fastethernet 0/2
PAR05(config-if)#switchport mode access
PAR05(config-if)#switchport access vlan 10
PAR05(config-if)#exit
PAR05(config)#
PAR05#exit
```

VLAN 20:

```
PAR05>enable
PAR05#configure terminal
PAR05(config)#vlan 20
PAR05(config-vlan)#name Segunda
PAR05(config-vlan)#interface fastethernet 0/3
PAR05(config-if)#switchport mode access
PAR05(config-if)#switchport access vlan 20
PAR05(config-if)#exit
PAR05(config)#interface fastethernet 0/4
PAR05(config-if)#switchport mode access
PAR05(config-if)#switchport access vlan 20
PAR05(config-if)#exit

PAR05(config)#exit

PAR05#exit
```

2. **Mostrar las VLAN creadas.**

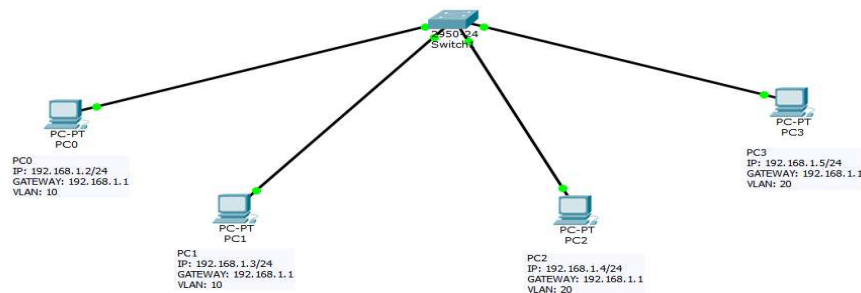
```
PAR05>enable
PAR05#show vlan brief
```

```
VLAN Name Status Ports
```

```
-----
1 default active Fa0/5, Fa0/6, Fa0/7, Fa0/8
```

Fa0/9, Fa0/10, Fa0/11, Fa0/12
 Fa0/13, Fa0/14, Fa0/15, Fa0/16
 Fa0/17, Fa0/18, Fa0/19, Fa0/20
 Fa0/21, Fa0/22, Fa0/23, Fa0/24
 10 Primera active Fa0/1, Fa0/2
 20 Segunda active Fa0/3, Fa0/4
 1002 fddi-default active
 1003 token-ring-default active
 1004 fddinet-default active
 1005 trnet-default active
 PAR05#

3. Comprobar que las VLAN creadas funcionan como tal.



Ahora para mostrar el funcionamiento de las Vlan haremos un serie de "ping" para ver de que máquinas recibimos respuesta y de cuáles no.

PING PC0 a PC1 (VLAN 10) y PING PC0 A PC3 Y PC4 (vlan 20):

PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=0ms TTL=128
 Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
 Reply from 192.168.1.3: bytes=32 time=0ms TTL=128
 Reply from 192.168.1.3: bytes=32 time=9ms TTL=128

Ping statistics for 192.168.1.3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
 Approximate round trip times in milli-seconds:
 Minimum = 0ms, Maximum = 9ms, Average = 2ms

PC>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:

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

Ping statistics for 192.168.1.4:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 192.168.1.5

Pinging 192.168.1.5 with 32 bytes of data:

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

Ping statistics for 192.168.1.5:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

Ahora vamos hacer un ping desde los pc alojados en VLAN 20. Desde PC3 a PC2 (VLAN 20) y desde PC3 a PC0-PC1 (VLAN 10):

PC>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=0ms TTL=128
Reply from 192.168.1.4: bytes=32 time=14ms TTL=128
Reply from 192.168.1.4: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.1.4:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 14ms, Average = 3ms

PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

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

Ping statistics for 192.168.1.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

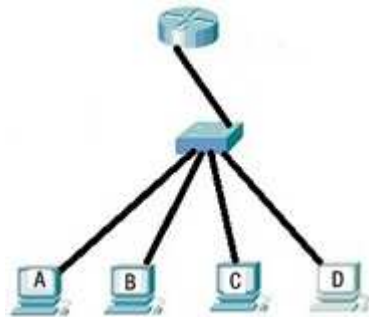
Request timed out.
Request timed out.

Request timed out.
Request timed out.

Ping statistics for 192.168.1.2:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

CUESTIÓN 2

Dada una red como la de la figura siguiente.



Se pide:

4. Crear dos subinterfaces en el router.

```
Router>enable
```

```
Router#configure terminal
```

```
Router(config)#hostname RouterPAR05
```

```
RouterPAR05(config)#interface fastethernet 0/1
```

```
RouterPAR05(config-if)#no shutdown
```

```
RouterPAR05(config-if)#exit
```

```
RouterPAR05(config)#interface fastethernet 0/1.2
```

```
RouterPAR05(config-subif)#
```

```
%LINK-5-CHANGED: Interface FastEthernet0/1.2, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.2,  
changed state to up
```

```
RouterPAR05(config)#interface fastethernet 0/1.3
```

```
RouterPAR05(config-subif)#
```

```
%LINK-5-CHANGED: Interface FastEthernet0/1.3, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.3,  
changed state to up
```

```
RouterPAR05(config-subif)#exit
```

```
RouterPAR05(config)#exit
```

```
RouterPAR05#exit
```

5. Asociar las subinterfaces a dos VLAN diferentes que se encuentren en dos redes diferentes (192.168.1.0 y 192.168.2.0).

```
RouterPAR05(config)#interface fastEthernet 0/1.2
RouterPAR05(config-subif)#description Dos VLAN2
RouterPAR05(config-subif)#encapsulation dot1Q 2
```

```
RouterPAR05(config-subif)#ip address 192.168.1.1 255.255.255.0
```

```
RouterPAR05(config-subif)#exit
RouterPAR05(config)#interface fastEthernet 0/1.3
RouterPAR05(config-subif)#description Tres VLAN3
RouterPAR05(config-subif)#encapsulation dot1Q 3
RouterPAR05(config-subif)#ip address 192.168.2.1 255.255.255.0
```



Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
FastEthernet0/0	Down	--	<not set>	<not set>	0003.E40C.AD01
FastEthernet0/1	Up	--	<not set>	<not set>	0003.E40C.AD02
FastEthernet0/1.2	Up	--	192.168.1.1/24	<not set>	0003.E40C.AD02
FastEthernet0/1.3	Up	--	192.168.2.1/24	<not set>	0003.E40C.AD02
Vlan1	Down	1	<not set>	<not set>	0003.E4C7.D8BA

Hostname: RouterPAR05

Physical Location: Intercity, Home City, Corporate Office, Wiring Closet

6. Las VLAN a las que se hace referencia en el ejercicio 5 deben contener a los 4 PC, la mitad en cada VLAN. Escribe la dirección IP, máscara de red y puerta de enlace que deben tener cada uno de ellos.

Vlan2:

PC0 IP: 192.168.1.2/24 **Mascara de red:**(255.255.255.0) **Puerta de enlace:** 192.168.1.1

PC1 IP: 192.168.1.3/24 **Mascara de red:**(255.255.255.0) **Puerta de enlace:** 192.168.1.1

Vlan3:

PC2 IP: 192.168.2.2/24 **Mascara de red:**(255.255.255.0) **Puerta de enlace:** 192.168.2.1

PC3 IP: 192.168.2.3/24 **Mascara de red:**(255.255.255.0) **Puerta de enlace:** 192.168.2.1

7. Si las VLAN a las que se hace referencia están creadas en el conmutador, escribir la configuración que hace posible que el enlace troncal esté en la interfaz FastEthernet0/1 del conmutador.

```
PAR05>enable
PAR05#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
PAR05(config)#int fa 0/1
```

```
PAR05(config-if)#switchport mode trunk
```

```
PAR05(config-if)#switchport trunk allowed vlan add 2
```

```
PAR05(config-if)#switchport trunk allowed vlan add 3
```

```
PAR05(config-if)#exit
```

```
PAR05(config)#exit
```

```
PAR05#show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1
Port	Vlans allowed on trunk			
Fa0/1	1-1005			
Port	Vlans allowed and active in management domain			
Fa0/1	1,2,3			
Port	Vlans in spanning tree forwarding state and not pruned			
Fa0/1	1,2,3			

```
Switch#
```

Podemos ver como vlan 1 está incluida en la interface 0/1. Para arreglar esto hacemos lo siguiente:

```
PAR05#configure terminal
```

```
PAR05(config)#int fa 0/1
```

```
PAR05(config-if)#switchport trunk allowed vlan remove 1
```

```
PAR05(config-if)#exit
```

```
PAR05(config)#exit
```

```
PAR05#show interfaces trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1
Port	Vlans allowed on trunk			
Fa0/1	2-1005			
Port	Vlans allowed and active in management domain			
Fa0/1	2,3			
Port	Vlans in spanning tree forwarding state and not pruned			
Fa0/1	none			

8. Escribir la configuración que crea las VLAN 2 y 3 en el conmutador.

```
PAR05(config)#vlan 2
```

```
PAR05(config-vlan)# name Dos
```

```
PAR05(config-vlan)#exit
```

```
PAR05(config)#vlan 3
```

```
PAR05(config-vlan)#name Tres
```

```
PAR05(config)#exit
```

```
PAR05(config)#show vlan
```

VLAN	Name	Status	Ports
1	default	active	Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, Fa0/12, Fa0/13 Fa0/14, Fa0/15, Fa0/16, Fa0/17 Fa0/18, Fa0/19, Fa0/20, Fa0/21 Fa0/22, Fa0/23, Fa0/24
2	Dos	active	Fa0/2, Fa0/3
3	Tres	active	Fa0/4, Fa0/5
1002	fddi-default	act/unsup	
1003	token-ring-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
------	------	------	-----	--------	--------	----------	-----	----------	--------	--------

9. Escribir las órdenes que permiten asociar 2 interfaces disponibles a la VLAN 2 y otras dos a la VLAN 3.

PAR05(config)#interface fastEthernet 0/2

PAR05(config-if)#switchport mode access

PAR05(config-if)#switchport access vlan 2

PAR05(config-if)#exit

PAR05(config)#interface fastEthernet 0/3

PAR05(config-if)#switchport mode access

PAR05(config-if)#switchport access vlan 2

PAR05(config-if)#exit

PAR05(config)#interface fastEthernet 0/4

PAR05(config-if)#switchport mode access

PAR05(config-if)#switchport access vlan 3

PAR05(config-if)#exit

PAR05(config)#interface fastEthernet 0/5

PAR05(config-if)#switchport mode access

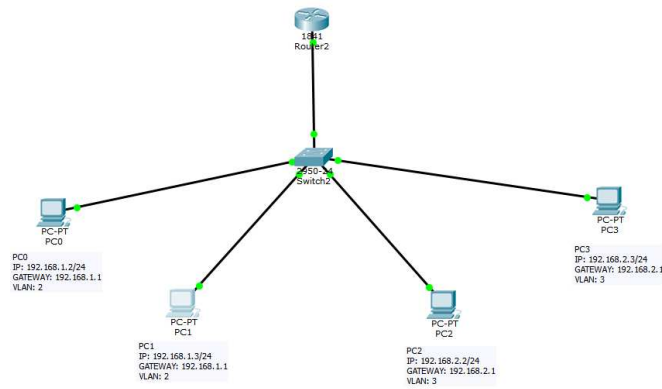
PAR05(config-if)#switchport access vlan 3

PAR05(config-if)#exit

10. Escribir los comandos que hacen que todas las configuraciones anteriores sean las configuraciones que tenga el switch en su próximo reinicio.

PAR05#copy running-config startup-config

Por último haremos una serie de pruebas para ver si los equipos tienen comunicación entre ellos:



Realizamos un PING desde el PC0 a todas las máquinas:

PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
 Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
 Reply from 192.168.1.3: bytes=32 time=0ms TTL=128
 Reply from 192.168.1.3: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.1.3:

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

PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=1ms TTL=127
 Reply from 192.168.2.2: bytes=32 time=1ms TTL=127
 Reply from 192.168.2.2: bytes=32 time=1ms TTL=127
 Reply from 192.168.2.2: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.2.2:

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

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
 Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
 Reply from 192.168.2.3: bytes=32 time=1ms TTL=127

Reply from 192.168.2.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.2.3:

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

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 1ms, Average = 0ms