

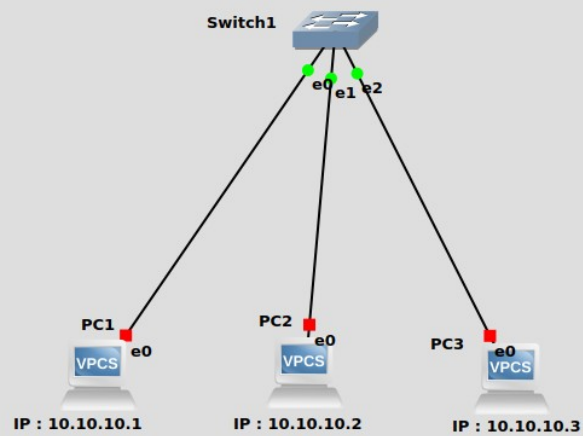
190905514
ROLL NO : 62

MOHAMMAD TOFIK
SECTION : C3

BATCH : C3
SEM : 5th

-: CN-LAB-7 :-

EXCERCISE :



Ping PC1 to PC2 :

```
PC1> show ip

NAME       : PC1[1]
IP/MASK    : 10.10.10.1/28
GATEWAY    : 255.255.255.240
DNS        :
MAC        : 00:50:79:66:68:00
LPORT      : 10008
RHOST:PORT : 127.0.0.1:10009
MTU:       : 1500

PC1> ping 10.10.10.2
84 bytes from 10.10.10.2 icmp_seq=1 ttl=64 time=0.321 ms
84 bytes from 10.10.10.2 icmp_seq=2 ttl=64 time=0.329 ms
84 bytes from 10.10.10.2 icmp_seq=3 ttl=64 time=0.402 ms
84 bytes from 10.10.10.2 icmp_seq=4 ttl=64 time=0.504 ms
84 bytes from 10.10.10.2 icmp_seq=5 ttl=64 time=0.381 ms

PC1> █
```

Ping PC2 to PC3 :

```
PC2> show ip

NAME       : PC2[1]
IP/MASK    : 10.10.10.2/28
GATEWAY    : 255.255.255.240
DNS        :
MAC        : 00:50:79:66:68:01
LPORT      : 10006
RHOST:PORT : 127.0.0.1:10007
MTU:       : 1500

PC2> ping 10.10.10.3
84 bytes from 10.10.10.3 icmp_seq=1 ttl=64 time=0.334 ms
84 bytes from 10.10.10.3 icmp_seq=2 ttl=64 time=0.332 ms
84 bytes from 10.10.10.3 icmp_seq=3 ttl=64 time=0.488 ms
84 bytes from 10.10.10.3 icmp_seq=4 ttl=64 time=0.484 ms
84 bytes from 10.10.10.3 icmp_seq=5 ttl=64 time=0.332 ms

PC2> █
```

Ping PC3 to PC1 :

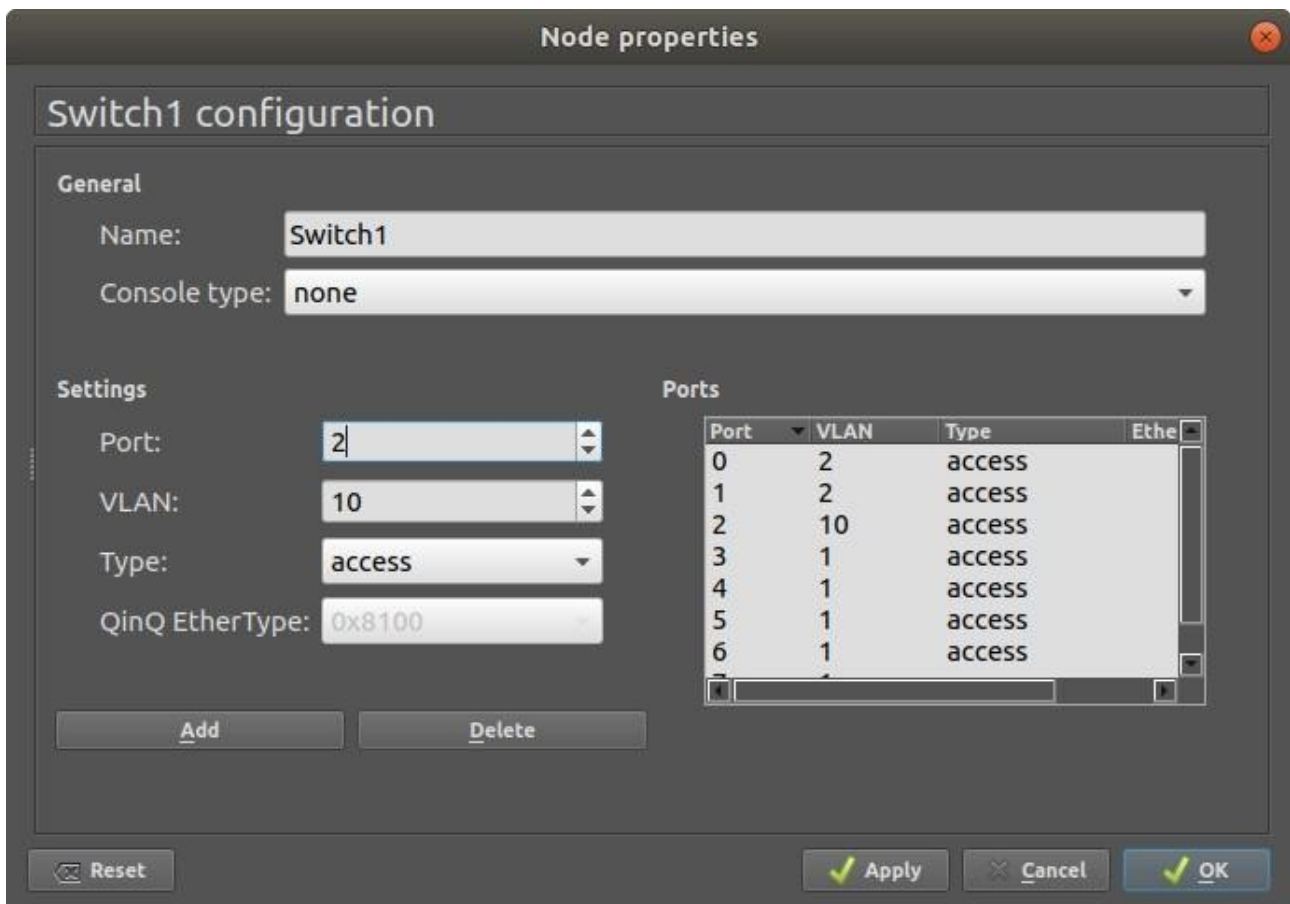
```
PC3> show ip

NAME       : PC3[1]
IP/MASK     : 10.10.10.3/28
GATEWAY     : 255.255.255.240
DNS         :
MAC         : 00:50:79:66:68:02
LPORT      : 10010
RHOST:PORT  : 127.0.0.1:10011
MTU         : 1500

PC3> ping 10.10.10.1
84 bytes from 10.10.10.1 icmp_seq=1 ttl=64 time=0.359 ms
84 bytes from 10.10.10.1 icmp_seq=2 ttl=64 time=0.374 ms
84 bytes from 10.10.10.1 icmp_seq=3 ttl=64 time=0.378 ms
84 bytes from 10.10.10.1 icmp_seq=4 ttl=64 time=0.424 ms
84 bytes from 10.10.10.1 icmp_seq=5 ttl=64 time=0.360 ms

PC3> 
```

Now we divide the LAN into 2 VLAN with IDs 2 and 10 respectively :



The image shows a 'Node properties' dialog box for 'Switch1 configuration'. It is divided into 'General' and 'Settings' sections. The 'General' section has 'Name: Switch1' and 'Console type: none'. The 'Settings' section has 'Port: 2', 'VLAN: 10', 'Type: access', and 'QinQ EtherType: 0x8100'. There are 'Add' and 'Delete' buttons below these settings. To the right, a 'Ports' table lists ports 0 through 6, their assigned VLANs (2 or 10), and their type (access). The table has columns for Port, VLAN, Type, and EtherType. At the bottom of the dialog are 'Reset', 'Apply', 'Cancel', and 'OK' buttons.

Port	VLAN	Type	EtherType
0	2	access	
1	2	access	
2	10	access	
3	1	access	
4	1	access	
5	1	access	
6	1	access	

Ping PC1 to PC2 :

```
PC1> ping 10.10.10.2
84 bytes from 10.10.10.2 icmp_seq=1 ttl=64 time=0.253 ms
84 bytes from 10.10.10.2 icmp_seq=2 ttl=64 time=0.396 ms
84 bytes from 10.10.10.2 icmp_seq=3 ttl=64 time=0.399 ms
84 bytes from 10.10.10.2 icmp_seq=4 ttl=64 time=0.390 ms
84 bytes from 10.10.10.2 icmp_seq=5 ttl=64 time=0.509 ms

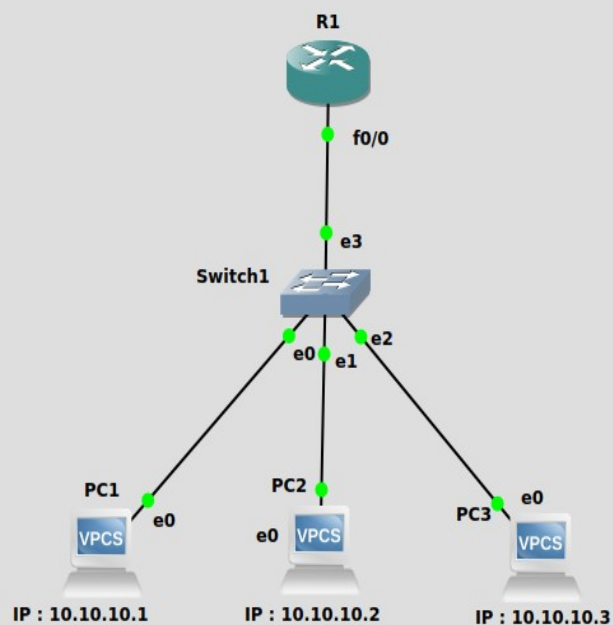
PC1> █
```

Ping PC3 to PC1 does not work :

```
PC3> ping 10.10.10.1
host (10.10.10.1) not reachable

PC3> █
```

We add a router to connect PC1 to PC3 :



Router R1 Configuration :

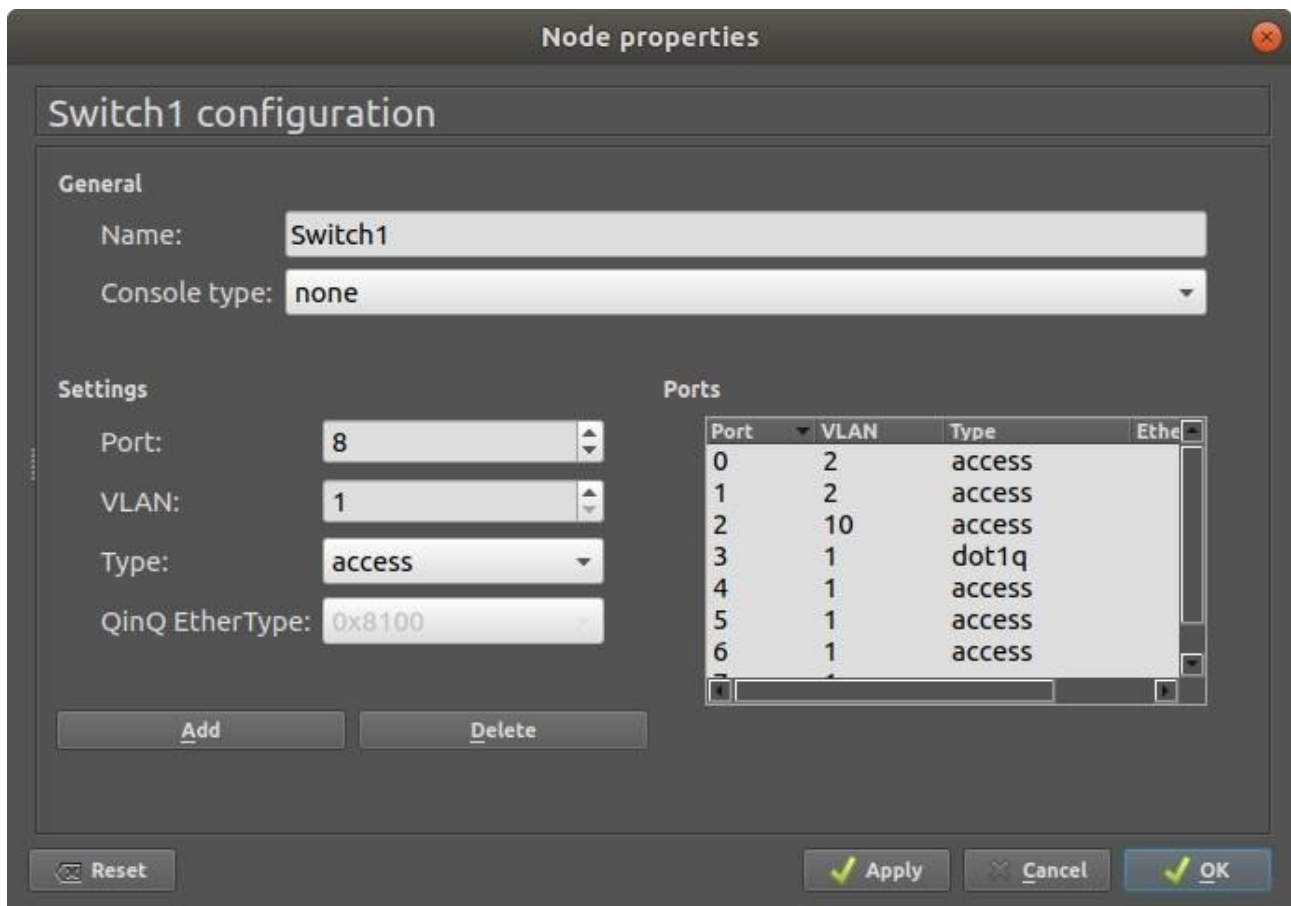
```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int f0/0
R1(config-if)#ip address 192.168.10.1 255.255.255.240
R1(config-if)#no sh
R1(config-if)#exit
R1(config)#
*Mar  1 00:00:56.387: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:00:57.387: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#int f0/0.2
R1(config-subif)#encapsulation dot1q 2
R1(config-subif)#ip add
*Mar  1 00:02:55.435: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
R1(config-subif)#ip address 192.168.1.65 255.255.255.192
R1(config-subif)#no sh
R1(config-subif)#exit
R1(config)#int f0/0.10
R1(config-subif)#encapsulation dot1q 10
R1(config-subif)#ip address 192.168.1.129 255.255.255.224
R1(config-subif)#no sh
R1(config-subif)#exit
R1(config)#exit
R1#
*Mar  1 00:04:15.543: %SYS-5-CONFIG_I: Configured from console by console
R1#sh ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
```

```
R1(config-subif)#ip address 192.168.1.129 255.255.255.224
R1(config-subif)#no sh
R1(config-subif)#exit
R1(config)#int f0/0.10
R1(config-subif)#encapsulation dot1q 10
R1(config-subif)#ip address 192.168.1.129 255.255.255.224
R1(config-subif)#no sh
R1(config-subif)#exit
R1(config)#exit
R1#
*Mar  1 00:04:15.543: %SYS-5-CONFIG_I: Configured from console by console
R1#sh ip route
Codes: 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
```

Gateway of last resort is not set

```
    192.168.10.0/28 is subnetted, 1 subnets
C       192.168.10.0 is directly connected, FastEthernet0/0
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.64/26 is directly connected, FastEthernet0/0.2
C       192.168.1.128/27 is directly connected, FastEthernet0/0.10
R1#
```

Node Properties :



The image shows a 'Node properties' dialog box for 'Switch1 configuration'. It has two main sections: 'General' and 'Settings'. The 'General' section has 'Name' set to 'Switch1' and 'Console type' set to 'none'. The 'Settings' section has 'Port' set to '8', 'VLAN' set to '1', 'Type' set to 'access', and 'QinQ EtherType' set to '0x8100'. There are 'Add' and 'Delete' buttons below the settings. To the right, there is a 'Ports' table with columns 'Port', 'VLAN', 'Type', and 'EtherType'. The table contains 7 rows of data. At the bottom of the dialog are 'Reset', 'Apply', 'Cancel', and 'OK' buttons.

Port	VLAN	Type	EtherType
0	2	access	
1	2	access	
2	10	access	
3	1	dot1q	
4	1	access	
5	1	access	
6	1	access	

Again ping Pc1 to Pc3 :

```
PC1> ping 10.10.10.3
84 bytes from 10.10.10.3 icmp_seq=1 ttl=64 time=0.470 ms
84 bytes from 10.10.10.3 icmp_seq=2 ttl=64 time=0.544 ms
84 bytes from 10.10.10.3 icmp_seq=3 ttl=64 time=0.547 ms
84 bytes from 10.10.10.3 icmp_seq=4 ttl=64 time=0.611 ms
84 bytes from 10.10.10.3 icmp_seq=5 ttl=64 time=0.537 ms
```

Wireshark :

No.	Time	Source	Destination	Protocol	Length	Info
1	2021-11-23 14:22:56.449188	Private 66:68:02	Broadcast	ARP	64	who has 192.168.1.129? Tell 192.168.1.130 [ETHERNET FRAME CHECK SEQUENCE ...]
2	2021-11-23 14:22:56.450671	ca:01:11:b7:00:00	Private 66:68:02	ARP	60	192.168.1.129 is at ca:01:11:b7:00:00
3	2021-11-23 14:22:56.451310	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0xe8ab, seq=1/256, ttl=64 (reply in 5)
4	2021-11-23 14:22:56.452045	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0xeaab, seq=2/512, ttl=64 (reply in 6)
5	2021-11-23 14:22:59.463605	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0xe8ab, seq=1/256, ttl=63 (request in 3)
6	2021-11-23 14:22:59.463715	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0xeaab, seq=2/512, ttl=63 (request in 4)
7	2021-11-23 14:23:00.452210	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0xecab, seq=3/768, ttl=64 (reply in 8)
8	2021-11-23 14:23:00.471204	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0xecab, seq=3/768, ttl=63 (request in 7)
9	2021-11-23 14:23:01.471601	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0xedab, seq=4/1024, ttl=64 (reply in 10)
10	2021-11-23 14:23:01.489334	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0xedab, seq=4/1024, ttl=63 (request in 9)
11	2021-11-23 14:23:02.489842	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0xeeab, seq=5/1280, ttl=64 (reply in 12)
12	2021-11-23 14:23:02.506718	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0xeeab, seq=5/1280, ttl=63 (request in 11)

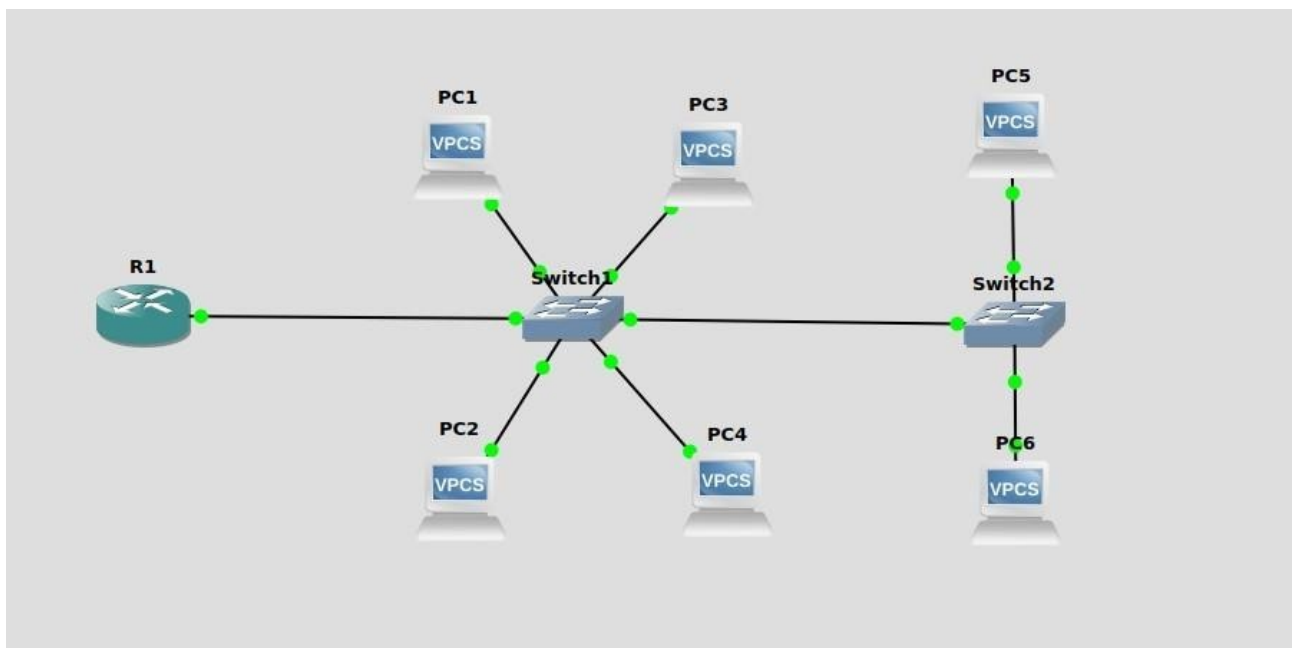
Frame Length: 64 bytes (512 bits)
 Capture Length: 64 bytes (512 bits)
 [Frame is marked: False]
 [Frame is ignored: False]
 [Protocols in frame: eth:ethertype:arp]
 [Coloring Rule Name: ARP]
 [Coloring Rule String: arp]

▶ Ethernet II, Src: Private_66:68:02 (00:50:79:66:68:02), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
 ▼ Address Resolution Protocol (request)
 Hardware type: Ethernet (1)
 Protocol type: IPv4 (0x0800)
 Hardware size: 6
 Protocol size: 4
 Opcode: request (1)
 Sender MAC address: Private_66:68:02 (00:50:79:66:68:02)
 Sender IP address: 192.168.1.130
 Target MAC address: Broadcast (ff:ff:ff:ff:ff:ff)
 Target IP address: 192.168.1.129

0000	ff ff ff ff ff ff 00 50	79 66 68 02 00 06 00 01P yfh.....
0010	08 00 06 04 00 01 00 50	79 66 68 02 c0 a8 01 82P yfh.....
0020	ff ff ff ff ff ff c0 a8	01 81 00 00 00 00 00 00P yfh.....
0030	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00P yfh.....

wireshark_-_20211123142256_6HK8EC.pcapng
 Packets: 12 · Displayed: 12 (100.0%) Profile: Default

ECERCISE 2:



Node Properties :

Node properties

Switch1 configuration

General

Name:

Switch1

Console type:

none

Settings

Port:

8

VLAN:

1

Type:

access

QinQ EtherType:

0x8100

Add

Delete

Ports

Port	VLAN	Type	Ethe
0	1	dot1q	
1	2	access	
2	2	access	
3	3	access	
4	3	access	
5	4	dot1q	
6	1	access	

Reset

Apply

Cancel

OK

Node properties

Switch2 configuration

General

Name:

Console type:

Settings

Port:

VLAN:

Type:

QinQ EtherType:

Ports

Port	VLAN	Type	Ethe
0	4	dot1q	
1	4	access	
2	4	access	
3	1	access	
4	1	access	
5	1	access	
6	1	access	

```

R1#show ip route
Codes: 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

Gateway of last resort is not set

    192.168.10.0/28 is subnetted, 1 subnets
C       192.168.10.0 is directly connected, FastEthernet0/0
    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.64/26 is directly connected, FastEthernet0/0.2
C       192.168.1.128/27 is directly connected, FastEthernet0/0.3
R1#

```

Ping PC2 to PC1

PC2 (VLAN 3) and PC1(VLAN 2) :

```
PC2> ip 192.168.1.130 255.255.255.224 192.168.1.129
Checking for duplicate address...
PC1 : 192.168.1.130 255.255.255.224 gateway 192.168.1.129

PC2> ping 192.168.1.66
192.168.1.66 icmp_seq=1 timeout
84 bytes from 192.168.1.66 icmp_seq=2 ttl=63 time=20.721 ms
84 bytes from 192.168.1.66 icmp_seq=3 ttl=63 time=15.223 ms
84 bytes from 192.168.1.66 icmp_seq=4 ttl=63 time=14.825 ms
84 bytes from 192.168.1.66 icmp_seq=5 ttl=63 time=14.283 ms

PC2>
```

Wireshark :

The image shows a Wireshark packet capture of network traffic. The top pane displays a list of 12 packets. The second pane shows the details of the selected packet (Frame 1), which is an ARP request from 192.168.1.130 to the broadcast address ff:ff:ff:ff:ff:ff. The third pane shows the raw packet data in hexadecimal and ASCII format.

No.	Time	Source	Destination	Protocol	Length	Info
1	2021-11-23 15:11:56.793211	Private 66:68:01	Broadcast	ARP	64	Who has 192.168.1.129? Tell 192.168.1.130 [ETHERNET FRAME CHECK SEQUENCE ...]
2	2021-11-23 15:11:56.797819	ca:01:17:86:00:00	Private 66:68:01	ARP	60	192.168.1.129 is at ca:01:17:86:00:00
3	2021-11-23 15:11:56.798384	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0x64b7, seq=1/256, ttl=64 (reply in 5)
4	2021-11-23 15:11:58.799049	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0x66b7, seq=2/512, ttl=64 (reply in 6)
5	2021-11-23 15:11:59.814371	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0x64b7, seq=1/256, ttl=63 (request in 3)
6	2021-11-23 15:11:59.814432	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0x66b7, seq=2/512, ttl=63 (request in 4)
7	2021-11-23 15:12:00.799185	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0x68b7, seq=3/768, ttl=64 (reply in 8)
8	2021-11-23 15:12:00.810025	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0x68b7, seq=3/768, ttl=63 (request in 7)
9	2021-11-23 15:12:01.810881	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0x69b7, seq=4/1024, ttl=64 (reply in 10)
10	2021-11-23 15:12:01.825688	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0x69b7, seq=4/1024, ttl=63 (request in 9)
11	2021-11-23 15:12:02.826706	192.168.1.130	192.168.1.66	ICMP	98	Echo (ping) request id=0x6ab7, seq=5/1280, ttl=64 (reply in 12)
12	2021-11-23 15:12:02.841304	192.168.1.66	192.168.1.130	ICMP	98	Echo (ping) reply id=0x6ab7, seq=5/1280, ttl=63 (request in 11)

Frame 1: 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface 0
Ethernet II, Src: Private 66:68:01 (00:50:79:66:68:01), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
Address Resolution Protocol (request)
Hardware type: Ethernet (1)
Protocol type: IPv4 (0x0800)
Hardware size: 6
Protocol size: 4
Opcode: request (1)
Sender MAC address: Private 66:68:01 (00:50:79:66:68:01)
Sender IP address: 192.168.1.130
Target MAC address: Broadcast (ff:ff:ff:ff:ff:ff)
Target IP address: 192.168.1.129

0000 ff ff ff ff ff 00 50 79 66 68 01 08 06 00 01P yfh...
0010 08 00 06 04 00 01 00 50 79 66 68 01 c0 a8 01 82P yfh...
0020 ff ff ff ff ff c0 a8 01 81 00 00 00 00 00 00
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00

Ping PC5(VLAN 4) to PC1(VLAN 2) :

```
PC5> ping 192.168.1.66
84 bytes from 192.168.1.66 icmp_seq=1 ttl=63 time=18.201 ms
84 bytes from 192.168.1.66 icmp_seq=2 ttl=63 time=15.059 ms
84 bytes from 192.168.1.66 icmp_seq=3 ttl=63 time=15.032 ms
84 bytes from 192.168.1.66 icmp_seq=4 ttl=63 time=14.883 ms
84 bytes from 192.168.1.66 icmp_seq=5 ttl=63 time=14.984 ms
```

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>
Expression... +

No.	Time	Source	Destination	Protocol	Length	Info
1	2021-11-23 15:20:02.333444	ca:01:17:86:00:00	DEC-MOP-Remote-Cons...	0x6002	77	DEC DNA Remote Console
2	2021-11-23 15:20:05.805266	192.168.2.2	192.168.1.66	ICMP	102	Echo (ping) request id=0x4db9, seq=1/256, ttl=64 (no response found!)
3	2021-11-23 15:20:05.812731	192.168.2.2	192.168.1.66	ICMP	102	Echo (ping) request id=0x4db9, seq=1/256, ttl=63 (reply in 4)
4	2021-11-23 15:20:05.813027	192.168.1.66	192.168.2.2	ICMP	102	Echo (ping) reply id=0x4db9, seq=1/256, ttl=64 (request in 3)
5	2021-11-23 15:20:05.823173	192.168.1.66	192.168.2.2	ICMP	102	Echo (ping) reply id=0x4db9, seq=1/256, ttl=63
6	2021-11-23 15:20:06.627759	ca:01:17:86:00:00	ca:01:17:86:00:00	LOOP	60	Reply
7	2021-11-23 15:20:06.824237	192.168.2.2	192.168.1.66	ICMP	102	Echo (ping) request id=0x4eb9, seq=2/512, ttl=64 (no response found!)
8	2021-11-23 15:20:06.828937	192.168.2.2	192.168.1.66	ICMP	102	Echo (ping) request id=0x4eb9, seq=2/512, ttl=63 (reply in 9)
9	2021-11-23 15:20:06.829154	192.168.1.66	192.168.2.2	ICMP	102	Echo (ping) reply id=0x4eb9, seq=2/512, ttl=64 (request in 8)
10	2021-11-23 15:20:06.839021	192.168.1.66	192.168.2.2	ICMP	102	Echo (ping) reply id=0x4eb9, seq=2/512, ttl=63
11	2021-11-23 15:20:07.840115	192.168.2.2	192.168.1.66	ICMP	102	Echo (ping) request id=0x4fb9, seq=3/768, ttl=64 (no response found!)
12	2021-11-23 15:20:07.844858	192.168.2.2	192.168.1.66	ICMP	102	Echo (ping) request id=0x4fb9, seq=3/768, ttl=63 (reply in 13)

▶ Frame 1: 77 bytes on wire (616 bits), 77 bytes captured (616 bits) on interface 0

▶ Ethernet II, Src: ca:01:17:86:00:00 (ca:01:17:86:00:00), Dst: DEC-MOP-Remote-Console (ab:00:00:02:00:00)

▶ Destination: DEC-MOP-Remote-Console (ab:00:00:02:00:00)

▶ Source: ca:01:17:86:00:00 (ca:01:17:86:00:00)

▶ Type: DEC DNA Remote Console (0x6002)

▼ Data (63 bytes)

Data: 3d00070000001000303000020002210003000600000000...

[Length: 63]

0000	ab 00 00 02 00 00 ca 01	17 86 00 00 60 02 3d 00
0010	07 00 00 00 01 00 03 03	00 00 02 00 02 21 00 03
0020	00 06 00 00 00 00 00 00	04 00 02 3c 00 05 00 02
0030	d8 05 06 00 02 00 01 07	00 06 ca 01 17 86 00 00
0040	64 00 01 79 00 01 01 01	91 01 02 ee 05	d.....

Ready to load or capture
Packets: 35 · Displayed: 35 (100.0%)
Profile: Default