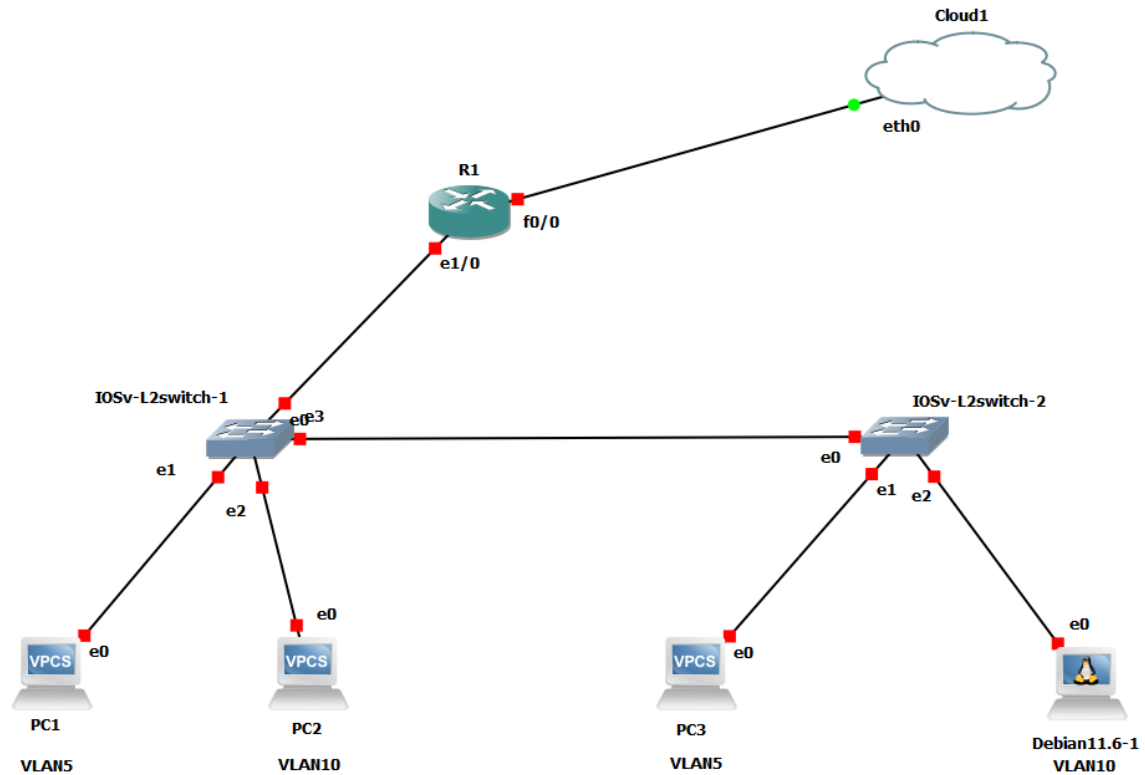# VLAN – VLAN trunking

Topology:

1. **ping/traceroute 8.8.8.8 from R1**

```
R1#ping 8.8.8.8
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 36/40/44 ms
R1#trace
R1#traceroute 8.8.8.8
Type escape sequence to abort.
Tracing the route to 8.8.8.8
VRF info: (vrf in name/id, vrf out name/id)
  1 192.168.23.2 8 msec 12 msec 8 msec
  2  *   *   *
  3  *   *   *
  4  *   *   *
  5  *   *   *
  6  *   *   *
  7  *   *   *
  8  *   *   *
  9  *   *   *
 10  *   *   *
 11  *   *   *
 12  *   *   *
 13  *   *   *
 14  *   *   *
 15  *   *   *
 16  *   *   *
 17  *   *   *
 18  *   *   *
 19  *   *   *
 20  *   *   *
 21  *   *   *
 22  *   *   *
 23  *   *   *
 24  *   *   *
 25  *   *   *
 26  *   *   *
 27  *   *   *
 28  *   *   *
 29  *   *   *
 30  *   *   *
```

2. show ip dhcp pool from R1

```
R1#show ip dhcp pool

Pool 1054311-1DHCP :
 Utilization mark (high/low)     : 100 / 0
 Subnet size (first/next)        : 0 / 0
 Total addresses                 : 126
 Leased addresses                : 2
 Pending event                   : none
 1 subnet is currently in the pool :
 Current index        IP address range                    Leased addresses
 105.43.11.4            105.43.11.1      - 105.43.11.126    2

Pool 1054311-2DHCP :
 Utilization mark (high/low)     : 100 / 0
 Subnet size (first/next)        : 0 / 0
 Total addresses                 : 126
 Leased addresses                : 2
 Pending event                   : none
 1 subnet is currently in the pool :
 Current index        IP address range                    Leased addresses
 105.43.11.131         105.43.11.129    - 105.43.11.254    2
```

3. show mac address-table from IOSvL2-1 & IOSvL2-2

```
vIOS-L2-01>show mac address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----
   1    0c70.c87b.0000    DYNAMIC     Gi0/3
   1    ca01.8dbf.001c    DYNAMIC     Gi0/0
   5    0050.7966.6801    DYNAMIC     Gi0/3
   5    ca01.8dbf.001c    DYNAMIC     Gi0/0
  10    0cbe.c75c.0000    DYNAMIC     Gi0/3
  10    ca01.8dbf.001c    DYNAMIC     Gi0/0
Total Mac Addresses for this criterion: 6
```

```
vIOS-L2-01> show mac address-table
          Mac Address Table
-------------------------------------------

Vlan    Mac Address       Type        Ports
----    -----------       --------    -----
   1    0cab.8303.0003    DYNAMIC     Gi0/0
   5    0050.7966.6801    DYNAMIC     Gi0/1
   5    ca01.8dbf.001c    DYNAMIC     Gi0/0
  10    0cbe.c75c.0000    DYNAMIC     Gi0/2
  10    ca01.8dbf.001c    DYNAMIC     Gi0/0
Total Mac Addresses for this criterion: 5
```

4. IP addresses from PC1, PC2, PC3 & Debian

```
PC1> show

NAME    IP/MASK                 GATEWAY         MAC                 LPORT   RHOST:PORT
PC1     105.43.11.3/25          105.43.11.1     00:50:79:66:68:00   20002   127.0.0.1:20003
        fe80::250:79ff:fe66:6800/64
```

```
PC2> show

NAME    IP/MASK                 GATEWAY         MAC                 LPORT   RHOST:PORT
PC2     105.43.11.130/25        105.43.11.129   00:50:79:66:68:02   20004   127.0.0.1:20005
        fe80::250:79ff:fe66:6802/64
```

```
PC3> show

NAME    IP/MASK                 GATEWAY         MAC                 LPORT   RHOST:PORT
PC3     105.43.11.2/25          105.43.11.1     00:50:79:66:68:01   20000   127.0.0.1:20001
        fe80::250:79ff:fe66:6801/64
```

```
debian@debian:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 0c:be:c7:5c:00:00 brd ff:ff:ff:ff:ff:ff
    altname enp0s4
    inet 105.43.11.131/25 brd 105.43.11.255 scope global dynamic ens4
       valid_lft 85647sec preferred_lft 85647sec
    inet6 fe80::ebe:c7ff:fe5c:0/64 scope link
       valid_lft forever preferred_lft forever
```

5. ping/traceroute 8.8.8.8 from PC1, PC2, PC3 & Debian

```
PC1> ping 8.8.8.8

84 bytes from 8.8.8.8 icmp_seq=1 ttl=127 time=74.448 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=127 time=87.349 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=127 time=68.141 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=127 time=90.346 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=127 time=65.516 ms

PC1> ping google.com
google.com resolved to 216.58.213.110

84 bytes from 216.58.213.110 icmp_seq=1 ttl=127 time=95.928 ms
84 bytes from 216.58.213.110 icmp_seq=2 ttl=127 time=87.706 ms
84 bytes from 216.58.213.110 icmp_seq=3 ttl=127 time=99.121 ms
84 bytes from 216.58.213.110 icmp_seq=4 ttl=127 time=88.802 ms
84 bytes from 216.58.213.110 icmp_seq=5 ttl=127 time=87.896 ms
```

```
PC2> ping 8.8.8.8

84 bytes from 8.8.8.8 icmp_seq=1 ttl=127 time=94.633 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=127 time=109.562 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=127 time=90.107 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=127 time=95.118 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=127 time=90.581 ms

PC2> ping google.com
google.com resolved to 142.251.140.78

84 bytes from 142.251.140.78 icmp_seq=1 ttl=127 time=110.175 ms
84 bytes from 142.251.140.78 icmp_seq=2 ttl=127 time=104.639 ms
84 bytes from 142.251.140.78 icmp_seq=3 ttl=127 time=125.733 ms
84 bytes from 142.251.140.78 icmp_seq=4 ttl=127 time=71.828 ms
84 bytes from 142.251.140.78 icmp_seq=5 ttl=127 time=101.753 ms
```

```
PC3> ping 8.8.8.8

84 bytes from 8.8.8.8 icmp_seq=1 ttl=127 time=86.115 ms
84 bytes from 8.8.8.8 icmp_seq=2 ttl=127 time=121.519 ms
84 bytes from 8.8.8.8 icmp_seq=3 ttl=127 time=72.443 ms
84 bytes from 8.8.8.8 icmp_seq=4 ttl=127 time=73.479 ms
84 bytes from 8.8.8.8 icmp_seq=5 ttl=127 time=142.397 ms

PC3> ping google.com
google.com resolved to 142.251.140.78

84 bytes from 142.251.140.78 icmp_seq=1 ttl=127 time=76.989 ms
84 bytes from 142.251.140.78 icmp_seq=2 ttl=127 time=82.914 ms
84 bytes from 142.251.140.78 icmp_seq=3 ttl=127 time=203.037 ms
84 bytes from 142.251.140.78 icmp_seq=4 ttl=127 time=87.826 ms
84 bytes from 142.251.140.78 icmp_seq=5 ttl=127 time=99.418 ms
```

```
debian@debian:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=127 time=107 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=127 time=98.8 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=127 time=71.5 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=127 time=98.3 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=127 time=82.2 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=127 time=73.2 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=127 time=142 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=127 time=101 ms
^C
--- 8.8.8.8 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7016ms
rtt min/avg/max/mdev = 71.455/96.766/141.564/21.084 ms
debian@debian:~$ ping google.com
PING google.com (142.250.187.174) 56(84) bytes of data.
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=1 ttl=127 time=94.1 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=2 ttl=127 time=90.0 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=3 ttl=127 time=74.8 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=4 ttl=127 time=93.8 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=5 ttl=127 time=90.4 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=6 ttl=127 time=97.5 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=7 ttl=127 time=95.3 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=8 ttl=127 time=107 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=9 ttl=127 time=96.5 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=10 ttl=127 time=137 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=11 ttl=127 time=85.2 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=12 ttl=127 time=97.7 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=13 ttl=127 time=96.2 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=14 ttl=127 time=123 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=15 ttl=127 time=94.2 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=16 ttl=127 time=90.8 ms
64 bytes from sof02s46-in-f14.1e100.net (142.250.187.174): icmp_seq=17 ttl=127 time=85.1 ms
^C
--- google.com ping statistics ---
18 packets transmitted, 17 received, 5.55556% packet loss, time 17020ms
rtt min/avg/max/mdev = 74.845/96.936/136.938/13.885 ms
```

6. **traceroute from Debian to PC1, PC2, PC3**

```
debian@debian:~$ traceroute 105.43.11.2
traceroute to 105.43.11.2 (105.43.11.2), 30 hops max, 60 byte packets
 1  105.43.11.129 (105.43.11.129)  27.017 ms  30.023 ms  29.918 ms
 2  105.43.11.2 (105.43.11.2)  66.191 ms  66.157 ms  66.644 ms
debian@debian:~$ traceroute 105.43.11.130
traceroute to 105.43.11.130 (105.43.11.130), 30 hops max, 60 byte packets
 1  105.43.11.130 (105.43.11.130)  32.753 ms  33.902 ms  34.420 ms
debian@debian:~$ traceroute 105.43.11.3
traceroute to 105.43.11.3 (105.43.11.3), 30 hops max, 60 byte packets
 1  105.43.11.129 (105.43.11.129)  13.001 ms  14.311 ms  22.811 ms
 2  105.43.11.3 (105.43.11.3)  56.379 ms  56.304 ms  56.179 ms
```