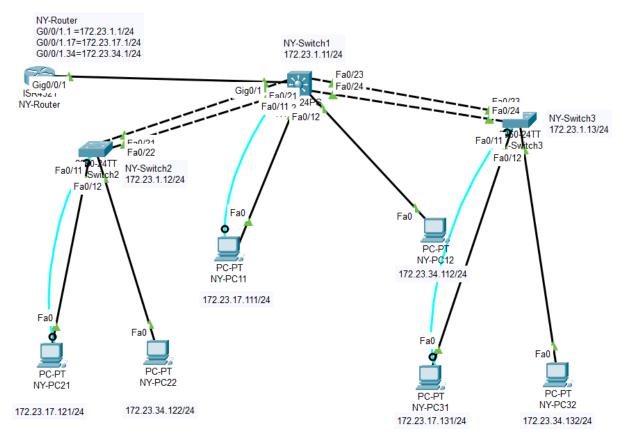
Justin Sterlacci Internetworking Professor Cannistra February 12th, 2023

Lab 3 Lab Report

Lab Description:

Set up a router within a Network to allow PCs on separate VLANS to communicate with each other.

Topography:



Syntax:

CLI Command Description Mode of Cisco OIS

ping	Used to ping ip addresses from a PC. You can ping other PC's or switches with this.	Windows CMD
Logging synchronous	Forces error messages to be on its own line, rather than interrupt a line that you're typing on.	Console Line

Enable	Enter Privileged Mode	User Mode
Conf t	Enter Global Configurator Mode	Privileged Mode
Line con 0	Enter the Console Line	Global Configurator Mode
Hostname	Used to name a switch or PC	Privileged Mode
Password	Used to set a password	Privileged Mode
Login	Used to require the password to utilize User Mode	Global Configurator Mode
Enable password	Used to set an unencrypted Privileged Password	Global Configurator Mode
Show ip interface brief (sh ip int brief)	Displays a brief list of all interfaces	Privileged Mode
vtp domain INETLAB	Renames the VTP domain from NULL to INETLAB	Global Configurator Mode
Vtp password cisco	Set a password within the VTP Domain	Global Configurator Mode
Vtp mode server/client	Sets the vtp mode between server or client, in the case of this lab.	Global Configurator Mode
Switchport mode access	Changes the mode of a switchport to access mode	Line configuration Mode (within a vlan)
Switchport trunk	Sets up the switch to switch connect to use	Within a vlan with a multi-
encapsulation dot1q	IEEE 802.1Q encapsulation	Connection switch
Switchport mode trunk	Sets the mode for the switchport to trunk	Within a vlan
Spanning-tree vlan xx root primary	Setting up a spanning tree within a vlan, and setting it to root primary	Privileged mode
Encapsulation dot1q xx	Sets up a VLAN in IEEE 802.1Q within a router	ROUTER Line Configuration Mode(within a sub interface)

Verification:

B) NY-Switch1 vlans

NY-Switchl#sh vlan

VLAN							s Ports			
1	defaul					ive H H H	Fa0/1, F Fa0/5, F Fa0/9, F Fa0/15,	Fa0/2, Fa0/6, Fa0/6, Fa0/10, Fa0/16, 1	0/3, Fa 0/7, Fa a0/13, 1 Fa0/17,	0/4 0/8 Fa0/14
17	BLUE				act:	ive E	a0/11		_	
34	GREEN				act:	ive E	a0/12			
1002	fddi-	default			act:	ive				
1003	token-	-ring-defau	lt		act:	ive				
1004	fddine	et-default			act:	ive				
1005	trnet-	-default			act:	ive				
		SAID			_	_	_	_		
		100001								0
17	enet	100017	1500	_	_	_	-	_	0	0
34	enet	100034	1500	-	-	-	-	_	0	0
		101002								0
1003	tr	101003	1500	-	-	-	-	_	0	0
1004	fdnet	101004	1500	-	-	-	ieee	_	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0
		SAID								
	te SPA1	N VLANs								
	ary Sed	condary Typ	e		Ports					

C)

NY-Switch2 vlans

NY-Switch2#sh vlan

	Name					tus P				
1 17 34 1002 1003 1004	BLUE GREEN fddi-c token- fddine	lt default ring-defau et-default	lt		act: act: act: act: act: act:	ive FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	a0/1, 1 a0/5, 1 a0/9, 1 a0/15, a0/15, ig0/1,	Fa0/2, Fa0/6, Fa0/6, Fa0/10, Fa0/10, Fa0/16, Fa0/20, 1	0/3, Fa 0/7, Fa a0/13, 1 Fa0/17,	0/8 Fa0/14 Fa0/18
1005	trnet-	-default			act:	ive				
		SAID			_	_	_	_		
		100001								
							_			-
		100017 100034							0	
		1010034							0	
		101002							-	0
		101003							-	0
		101005								_
1005	CINEC	101003	1300				Lom		0	0
		SAID								
		N VLANs								
	Primary Secondary Type Ports									

NY-Switch2 Trunks Interfaces

NY-Switch2#sh int trunk								
Port	Mode	Encapsulation	Status	Native vlan				
Po2	on	802.lq	trunking	1				
Port	Vlans allowed	d on trunk						
Po2	1-1005							
Port	Vlans allowed	d and active in	management dor	nain				
Po2	1,17,34							
Port	Vlans in spar	nning tree forwa	arding state an	nd not pruned				
Po2	1,17,34							

NY-Switch2 EtherChannel Summary

D)

NY-Switch3 vlans

NY-Switch3#sh vlan

						Status Ports				
1 17 34 1002 1003 1004	BLUE GREEN 02 fddi-default 03 token-ring-default 04 fddinet-default					ive F ive F ive F ive F ive ive ive ive	Fa0/1, Fa0/5, Fa0/5, Fa0/15, Fa0/19, Fa0/11, Fa0/11	Fa0/2, Fa0/6, Fa0/6, Fa0/10, Fa0/16, I Fa0/16, I Fa0/20, I	0/3, Fa 0/7, Fa a0/13, 1 Fa0/17,	0/4 0/8 Fa0/14 Fa0/18
1005	trnet-	-default			act:	ive				
		SAID								
17 34 1002 1003 1004 1005 VLAN 	enet enet fddi tr fdnet trnet Type	100001 100017 100034 101002 101003 101004 101005 SAID	1500 1500 1500 1500 1500 1500 MTU	- - - - - - Parent	- - - - - - RingNo	- - - - - - BridgeN	- - - ieee ibm Vo Stp	- - - - - BrdgMode	0 0 0 0 0 0 Transl	0 0 0 0 0 0 0 0
Primary Secondary Type Ports										

NY-Switch3 Trunk Interfaces

```
NY-Switch3#sh int trunk
          Mode
                       Encapsulation Status
                                                   Native vlan
                       802.1q
Po3
                                     trunking
           on
          Vlans allowed on trunk
Port.
Po3
          1-1005
Port
           Vlans allowed and active in management domain
           Vlans in spanning tree forwarding state and not pruned
Port
          1,17,34
Po3
```

NY-Switch3 Ether Summary

E) NY-PC11 to NY-PC21/31

```
Pinging 172.23.17.121 with 32 bytes of data:

Reply from 172.23.17.121: bytes=32 time=1ms TTL=128
Reply from 172.23.17.121: bytes=32 time<1ms TTL=128
Ping statistics for 172.23.17.121:

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

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

NY-PC11 -> NY-PC21
```

```
C:\>ping 172.23.17.131

Pinging 172.23.17.131 with 32 bytes of data:

Reply from 172.23.17.131: bytes=32 time<lms TTL=128
Ping statistics for 172.23.17.131:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms</pre>
```

NY-PC11 -> NY-PC31

F) NY-PC12 to NY-PC22/32

```
C:\>ping 172.23.34.122
Pinging 172.23.34.122 with 32 bytes of data:

Reply from 172.23.34.122: bytes=32 time<lms TTL=128
Reply from 172.23.34.122: bytes=32 time=lms TTL=128
Reply from 172.23.34.122: bytes=32 time<lms TTL=128
Reply from 172.23.34.122: bytes=32 time<lms TTL=128
Ping statistics for 172.23.34.122:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms</pre>
```

NY-PC12->NY-PC22

```
C:\>ping 172.23.34.132

Pinging 172.23.34.132 with 32 bytes of data:

Reply from 172.23.34.132: bytes=32 time<lms TTL=128
Reply from 172.23.34.132: bytes=32 time=14ms TTL=128
Reply from 172.23.34.132: bytes=32 time<lms TTL=128
Reply from 172.23.34.132: bytes=32 time<lms TTL=128
Ping statistics for 172.23.34.132:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 14ms, Average = 3ms</pre>
```

NY-PC12->NY-PC32

G)

Interfaces in an abbreviated format

```
GigabitEthernet0/0/1 unassigned YES unset administratively down down GigabitEthernet0/0/1 unassigned YES unset up unassigned GigabitEthernet0/0/1.1 172.23.1.1 YES manual
GigabitEthernet0/0/1.17172.23.17.1 YES manual up
                                                                                up
GigabitEthernet0/0/1.34172.23.34.1
Vlan1 unassigned
                                           YES manual up
                                        YES manual up
YES unset administratively down down
                                                                                up
                                          YES unset down
Vlan17
                         unassigned
NY-Router Routing table
NY-Router#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
       {\tt 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
     172.23.0.0/16 is variably subnetted, 6 subnets, 2 masks
        172.23.1.0/24 is directly connected, GigabitEthernet0/0/1.1
         172.23.1.1/32 is directly connected, GigabitEthernet0/0/1.1
L
С
         172.23.17.0/24 is directly connected, GigabitEthernet0/0/1.17
        172.23.17.1/32 is directly connected, GigabitEthernet0/0/1.17
т.
C
        172.23.34.0/24 is directly connected, GigabitEthernet0/0/1.34
```

172.23.34.1/32 is directly connected, GigabitEthernet0/0/1.34

NY-Switch1 Trunk Interfaces

NV-Switchlich int trunk

NY-SWITCHI#	sn int trunk			
Port	Mode	Encapsulation	Status	Native vlan
Po2	on	802.1q	trunking	1
Po3	on	802.1q	trunking	1
Gig0/l	on	802.1q	trunking	1
Port	Vlans allowe	d on trunk		
Po2	1-1005			
Po3	1-1005			
Gig0/l	1-1005			
Port	Vlans allowe	d and active in	management do	main
Po2	1,17,34			
Po3	1,17,34			
Gig0/l	1,17,34			
Port	Vlans in spa	nning tree forw	arding state a	and not pruned
Po2	1,17,34			
Po3	1,17,34			
Giq0/1	1,17,34			

H)

Ping from NY-PC11 to Default Gateway, however this worked on all PC's

```
C:\>ping 172.23.1.0

Pinging 172.23.1.0 with 32 bytes of data:

Reply from 172.23.17.1: bytes=32 time<lms TTL=255
Reply from 172.23.17.1: bytes=32 time=6ms TTL=255
Reply from 172.23.17.1: bytes=32 time<lms TTL=255
Reply from 172.23.17.1: bytes=32 time<lms TTL=255
Reply from 172.23.17.1: bytes=32 time<lms TTL=255
Ping statistics for 172.23.1.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 6ms, Average = 1ms</pre>
```

I)NY-PC11 to NY-PC12/22/32

```
C:\>ping 172.23.34.112

Pinging 172.23.34.112 with 32 bytes of data:

Reply from 172.23.34.112: bytes=32 time<lms TTL=127
Reply from 172.23.34.112: bytes=32 time=lms TTL=127
Reply from 172.23.34.112: bytes=32 time<lms TTL=127
Reply from 172.23.34.112: bytes=32 time<lms TTL=127
Ping statistics for 172.23.34.112:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms</pre>
```

NY-PC11 -> NY-PC12

```
C:\>ping 172.23.34.122
Pinging 172.23.34.122 with 32 bytes of data:
Reply from 172.23.34.122: bytes=32 time<1ms TTL=127
Ping statistics for 172.23.34.122:
   Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
approximate round trip times in milli-seconds:
  Minimum = 0ms, Maximum = 0ms, Average = 0ms
                                                       NY-PC11 -> NY-PC22
C:\>ping 172.23.34.132
Pinging 172.23.34.132 with 32 bytes of data:
Reply from 172.23.34.132: bytes=32 time<1ms TTL=127
Ping statistics for 172.23.34.132:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
   Minimum = Oms, Maximum = Oms, Average = Oms
                                                        NY-PC11 -> NY-PC32
J) NY-PC12 to NY-PC11/21/31
C:\>ping 172.23.17.111
Pinging 172.23.17.111 with 32 bytes of data:
Reply from 172.23.17.111: bytes=32 time<1ms TTL=127
Ping statistics for 172.23.17.111:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
   Minimum = 0ms, Maximum = 0ms, Average = 0ms
                                                         NY-PC12 -> NY-PC11
C:\>ping 172.23.17.121
Pinging 172.23.17.121 with 32 bytes of data:
Reply from 172.23.17.121: bytes=32 time<1ms TTL=127
Reply from 172.23.17.121: bytes=32 time<lms TTL=127
Reply from 172.23.17.121: bytes=32 time<1ms TTL=127
Reply from 172.23.17.121: bytes=32 time<1ms TTL=127
Ping statistics for 172.23.17.121:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
   Minimum = 0ms, Maximum = 0ms, Average = 0ms
                                                        NY-PC12 -> NY-PC21
```

```
C:\>ping 172.23.17.131

Pinging 172.23.17.131 with 32 bytes of data:

Reply from 172.23.17.131: bytes=32 time<lms TTL=127
Ping statistics for 172.23.17.131:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms</pre>
```

NY-PC12 -> NY-PC31

K)

While all the PC's can reach all of the other PC's, all of the PC's cannot reach all of the switches. This is due to the PC's not being linked directly to the switches, which results in the ping command being unable to reach the other switches.

L) Rapid Spanning-Tree Protocol on all 3 Switches

NY-Switch1

```
NY-Switchl# sh spanning-tree
VLAN0001
  Spanning tree enabled protocol rstp
             Priority
  Root, TD
                           32769
                           0001.637C.4C7C
              Address
              This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
  Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address 0001.637C.4C7C
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
              Aging Time 20
Interface
                 Role Sts Cost
                                     Prio.Nbr Type
                                 128.27
Po2
                  Desg FWD 9
                                                 Shr
                  Desg FWD 9
Gi 0/1
                  Desg FWD 4
                                     128.25 P2p
VLANO017
  Spanning tree enabled protocol rstp
             Priority 24593
Address 0001.637C.4C7C
  Root ID
              This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
  Bridge ID Priority 24593 (priority 24576 sys-id-ext 17)
              Address
                           0001.637C.4C7C
              Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
              Aging Time 20
Interface
                 Role Sts Cost
                                      Prio.Nbr Type
            Desg FWD 9
                                 128.27
128.11
128.28
128.25
Po2
                                                 Shr
Fa0/11
                  Desg FWD 19
                                                 P2p
Po3
                  Desg FWD 9
Gi0/1
                  Desg FWD 4
VLAN0034
  Spanning tree enabled protocol rstp
            Priority 24610
Address 0001.637C.4C7C
  Root ID
              This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
             Address 0001.637C.4C7C
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec Aging Time 20
  Bridge ID Priority 24610 (priority 24576 sys-id-ext 34)
                  Role Sts Cost
                                        Prio.Nbr Type
           Desg FWD 9
                                    128.27
Fa0/12
                  Desg FWD 19
                                        128.12
                                                  P2p
                  Desg FWD 9
Po3
Gi0/1
```

NY-Switch2

NY-Switch2#sh spanning-tree VLAN0001

Spanning tree enabled protocol rstp

Root ID

Priority 32769 Address 0001.637C.4C7C Cost

Port 27(Port-channel2)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
Address 00E0.B07B.C31B
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Role Sts Cost Prio.Nbr Type Po2

VLAN0017

Spanning tree enabled protocol rstp

Root ID Priority 24593 Address 0001.637C.4C7C

Cost

27 (Port-channel2) Port

Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24593 (priority 24576 sys-id-ext 17)
Address 00EO.BO7B.C31B
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Role Sts Cost Prio.Nbr Type Interface Desg FWD 19 128.11 P2p 128.27 Shr Fa0/11 Root FWD 9

VLAN0034

Spanning tree enabled protocol rstp
Root ID Priority 24610
Address 0001.637C.4C7C

Cost

Port 27(Port-channel2) Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24610 (priority 24576 sys-id-ext 34)
Address 00E0.B07B.C31B
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

e Role Sts Cost Pri Prio.Nbr Type Desg FWD 19 128.12 P2p Root FWD 9 128.27 Shr Po2

NY-Switch3

```
NY-Switch3#sh spanning-tree
VLAN0001
  Spanning tree enabled protocol rstp
  Root ID
             Priority
             Address
                        0001.637C.4C7C
             Cost
                        27 (Port-channel3)
             Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
  Bridge ID Priority 32769 (priority 32768 sys-id-ext 1)
             Address
                        000C.854D.B8D3
            Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec Aging Time 20
                 Role Sts Cost
                                Prio.Nbr Type
                          9 128.27 Shr
Po3
                 Root FWD 9
VI.ANOO17
  Spanning tree enabled protocol rstp
  Root ID
             Priority
                        24593
             Address
                         0001.637C.4C7C
             Cost
                        27 (Port-channel3)
             Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
  Bridge ID Priority 24593 (priority 24576 sys-id-ext 17)
             Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
             Aging Time 20
Interface
               Role Sts Cost
                                Prio.Nbr Type
                Desg FWD 19 128.11 P2p
Root FWD 9 128.27 Shr
Fa0/11
VLAN0034
  Spanning tree enabled protocol rstp
           Priority 24610
                         0001.637C.4C7C
            Address
             Port
                        27 (Port-channel3)
            Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Bridge ID Priority 24610 (priority 24576 sys-id-ext 34)
Address 000C.854D.B8D3
            Address 000C.854D.B8D3
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
            Aging Time 20
               Role Sts Cost
           Desg FWD 19 128.12 P2p
Po3
               Root FWD 9
                                   128.27 Shr
```

Conclusion:

This Lab was not significantly harder than the last lab, however I ran into some headaches when setting up the Router, mainly due to it being the first time setting up a router by myself. These headaches were quickly resolved as soon as I looked at my notes from last class, and from there on it was smooth sailing.