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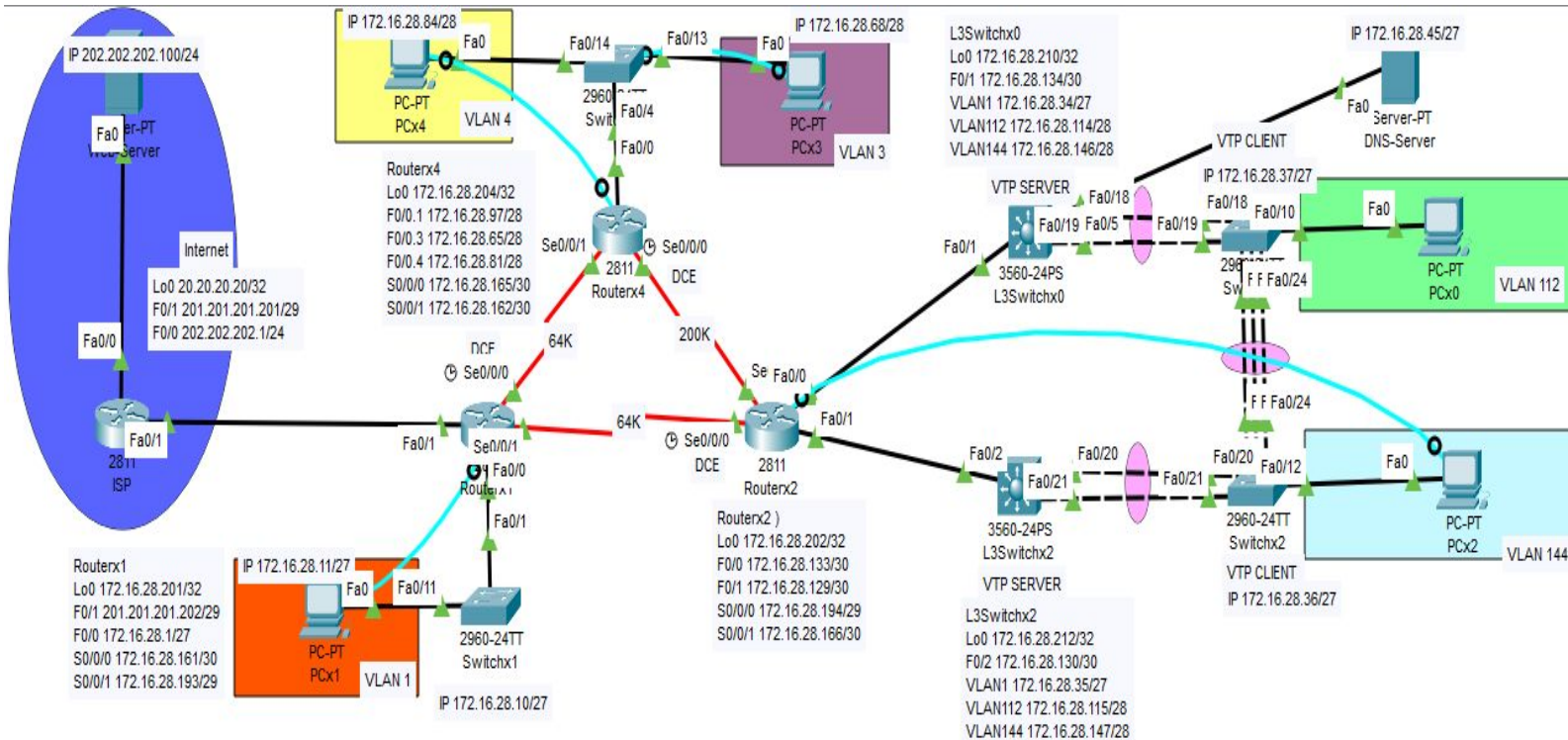
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Internetworking

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Challenge Lab 02

Network Topology:

1. VLANs

Layer 2 Switches

```
                                    Fa0/20, Fa0/21,                                      Fa0/18,
Gig0/1, Gig0/2
112  PCx0                     active    Fa0/10          Gig0/1, Gig0/2
144  PCx2                     active                    112  PCx0                  active
1002 fddi-default             active                    144  PCx2                  active    Fa0/12
                                                        1002 fddi-default          active

        Gig0/2
        3    VLAN0003                       active    Fa0/13
        4    VLAN0004                       active    Fa0/14
```

Layer 3 Switches

```
up                                                      up
Vlan1                172.16.28.34    YES manual up      Vlan1                172.16.28.35    YES manual up
up                                                      up
Vlan112              172.16.28.114   YES manual up      Vlan112              172.16.28.115   YES manual up
up                                                      up
Vlan144              172.16.28.146   YES manual up      Vlan144              172.16.28.147   YES manual up
```

2. STP

Layer 3 Switch 0

```
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    4097
             Address     00D0.5845.2EBC
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    4097  (priority 4096 sys-id-ext 1)
             Address     00D0.5845.2EBC
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- --------
----------------------------------
Po2              Desg FWD 9         128.28   Shr
Fa0/5            Desg FWD 19        128.5    P2p

VLAN0112
  Spanning tree enabled protocol ieee
  Root ID    Priority    4208
             Address     00D0.5845.2EBC
             This bridge is the root
```

Layer 3 Switch 2

```
VLAN0112
  Spanning tree enabled protocol ieee
  Root ID    Priority    4208
             Address     00D0.5845.2EBC
             Cost        26
             Port        27(Port-channel
             Hello Time  2 sec  Max Age 2

  Bridge ID  Priority    28784  (priority
             Address     0090.2B1D.4521
             Hello Time  2 sec  Max Age 2
             Aging Time  20

Interface        Role Sts Cost      Prio.
---------------- ---- --- --------- -----
----------------------------------
Po1              Root FWD 9         128.2

VLAN0144
  Spanning tree enabled protocol ieee
  Root ID    Priority    4240
             Address     0090.2B1D.4521
             This bridge is the root
```

```
VLAN0144
  Spanning tree enabled protocol ieee
  Root ID    Priority    4240
             Address     0090.2B1D.4521
             Cost        26
             Port        28(Port-channel2)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    8336  (priority 8192 sys-id-ext 144)
             Address     00D0.5845.2EBC
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20
```

```
L3xSwitchx2#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    4097
             Address     00D0.5845.2EBC
             Cost        26
             Port        27(Port-channel1)
             Hello Time  2 sec  Max Age 20 sec

  Bridge ID  Priority    28673  (priority 28672
             Address     0090.2B1D.4521
             Hello Time  2 sec  Max Age 20 sec
             Aging Time  20
```

3. EtherChannel

Layer 2 Switches

```
                                         Port-channel: Po1     (Primary Aggregator)
                                         ------------
Group: 2
----------                               Age of the Port-channel    = 00d:00h:53m:45s
            Port-channels in the group:  Logical slot/port    = 2/1        Number of ports = 2
            ---------------------------  GC                   = 0x00000000       HotStandBy po:
                                         Port state           = Port-channel
                                         Protocol             =    LACP
Port-channel: Po2     (Primary Aggregator) Port Security       = Disabled
------------
                                         Ports in the Port-channel:
Age of the Port-channel    = 00d:00h:51m:41s
Logical slot/port    = 2/2        Number of ports = 2  Index   Load    Port      EC state           No of bits
GC                   = 0x00000000       HotStandBy po: ------+------+------+------------------+-----------
Port state           = Port-channel        0     00    Fa0/20   Active            0
Protocol             =    LACP             0     00    Fa0/21   Active            0
Port Security        = Disabled       Time since last port bundled:    00d:00h:53m:45s
                                      Group: 3
Ports in the Port-channel:            ----------
                                                  Port-channels in the group:
Index   Load    Port      EC state           No of bits     ---------------------------
------+------+------+------------------+-----------
  0     00    Fa0/19   Active            0    Port-channel: Po3     (Primary Aggregator)
  0     00    Fa0/18   Active            0    ------------
Time since last port bundled:    00d:00h:51m:08s  |
Group: 3                              Age of the Port-channel    = 00d:00h:53m:45s
----------                            Logical slot/port    = 2/3        Number of ports = 3
            Port-channels in the group:  GC                   = 0x00000000       HotStandBy po:
            ---------------------------  Port state           = Port-channel
                                         Protocol             =    LACP
                                         Port Security        = Disabled
Port-channel: Po3     (Primary Aggregator)
------------                          Ports in the Port-channel:

Age of the Port-channel    = 00d:00h:51m:41s  Index   Load    Port      EC state           No of bits
Logical slot/port    = 2/3        Number of ports = 3  ------+------+------+------------------+-----------
GC                   = 0x00000000       HotStandBy po:    0     00    Fa0/24   Active            0
Port state           = Port-channel        0     00    Fa0/23   Active            0
Protocol             =    LACP
Port Security        = Disabled
```

Layer 3 Switches

```
Group: 2                                   Group: 1
----------                                 ----------
            Port-channels in the group:                Port-channels in the group:
            ---------------------------                ---------------------------

Port-channel: Po2     (Primary Aggregator)  Port-channel: Po1     (Primary Aggregator)
------------                                ------------

Age of the Port-channel    = 00d:00h:58m:32s  Age of the Port-channel    = 00d:00h:58m:47s
Logical slot/port    = 2/2        Number of ports = 2  Logical slot/port    = 2/1        Number of ports = 2
GC                   = 0x00000000       HotStandBy port = null  GC                   = 0x00000000       HotStandBy por
Port state           = Port-channel        Port state           = Port-channel
Protocol             =    LACP             Protocol             =    LACP
Port Security        = Disabled            Port Security        = Disabled

Ports in the Port-channel:                 Ports in the Port-channel:

Index   Load    Port      EC state     No of bits  Index   Load    Port      EC state     No of bits
------+------+------+------------------+-----------  ------+------+------+------------------+-----------
  0     00    Fa0/19   Active          0            0     00    Fa0/21   Active          0
  0     00    Fa0/18   Active          0            0     00    Fa0/20   Active          0
Time since last port bundled:    00d:00h:58m:32s   Fa0/18  Time since last port bundled:    00d:00h:58m:47s
```

4. InterVLAN Routing with a Router-on-a-Stick

Routerx4

```
routerx4#show ip int brief
Interface               IP-Address      OK? Method Status          Protocol
FastEthernet0/0         unassigned      YES unset   up              up
FastEthernet0/0.1       172.16.28.97    YES manual  up              up
FastEthernet0/0.3       172.16.28.65    YES manual  up              up
FastEthernet0/0.4       172.16.28.81    YES manual  up              up
```

PC4 Pinging PC3 and its Vlan Sub interface

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.16.28.68

Pinging 172.16.28.68 with 32 bytes of data:

Request timed out.
Reply from 172.16.28.68: bytes=32 time<1ms TTL=127
Reply from 172.16.28.68: bytes=32 time<1ms TTL=127
Reply from 172.16.28.68: bytes=32 time<1ms TTL=127

Ping statistics for 172.16.28.68:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% lo
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.16.28.81

Pinging 172.16.28.81 with 32 bytes of data:

Reply from 172.16.28.81: bytes=32 time<1ms TTL=255
Reply from 172.16.28.81: bytes=32 time<1ms TTL=255
Reply from 172.16.28.81: bytes=32 time<1ms TTL=255
Reply from 172.16.28.81: bytes=32 time<1ms TTL=255
```

PC3 pinging its Vlan Sub interface as well as Vlans 1 subinterface

```
Pinging 172.16.28.65 with 32 bytes of data:

Reply from 172.16.28.65: bytes=32 time<1ms TTL=255
Reply from 172.16.28.65: bytes=32 time<1ms TTL=255
Reply from 172.16.28.65: bytes=32 time<1ms TTL=255
Reply from 172.16.28.65: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.28.65:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% lo
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.16.28.97

Pinging 172.16.28.97 with 32 bytes of data:

Reply from 172.16.28.97: bytes=32 time=1ms TTL=255
Reply from 172.16.28.97: bytes=32 time<1ms TTL=255
Reply from 172.16.28.97: bytes=32 time<1ms TTL=255
Reply from 172.16.28.97: bytes=32 time<1ms TTL=255
```

5. InterVLAN Routing with SVIs

Layer 3 Switches

```
up                                          up
Vlanl          172.16.28.34   YES manual up Vlanl          172.16.28.35   YES manual up
up                                          up
Vlanll2        172.16.28.114  YES manual up Vlanll2        172.16.28.115  YES manual up
up                                          up
Vlanl44        172.16.28.146  YES manual up Vlanl44        172.16.28.147  YES manual up
```

PCx2 pinging Pcx0 and Vlan 144 SVI   PCx0 pinging Vlan 1 and Vlan 112 SVI

```
C:\>ping 172.16.28.116

Pinging 172.16.28.116 with 32 bytes of data:

Reply from 172.16.28.116: bytes=32 time<1ms TTL=127
Reply from 172.16.28.116: bytes=32 time<1ms TTL=127
Reply from 172.16.28.116: bytes=32 time<1ms TTL=127
Reply from 172.16.28.116: bytes=32 time<1ms TTL=127

Ping statistics for 172.16.28.116:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% los
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.16.28.144

Pinging 172.16.28.144 with 32 bytes of data:

Reply from 172.16.28.147: bytes=32 time<1ms TTL=255
Reply from 172.16.28.146: bytes=32 time<1ms TTL=255
Reply from 172.16.28.147: bytes=32 time=1ms TTL=255
Reply from 172.16.28.146: bytes=32 time=1ms TTL=255
```

```
Pinging 172.16.28.34 with 32 bytes of data:

Reply from 172.16.28.34: bytes=32 time<1ms TTL=255
Reply from 172.16.28.34: bytes=32 time<1ms TTL=255
Reply from 172.16.28.34: bytes=32 time<1ms TTL=255
Reply from 172.16.28.34: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.28.34:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% lo
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.16.28.114

Pinging 172.16.28.114 with 32 bytes of data:

Reply from 172.16.28.114: bytes=32 time<1ms TTL=255
Reply from 172.16.28.114: bytes=32 time<1ms TTL=255
Reply from 172.16.28.114: bytes=32 time<1ms TTL=255
Reply from 172.16.28.114: bytes=32 time<1ms TTL=255
```

6. Default Static Routing

The route I entered

```
ISP#show running-config | include ip route        routerxl#show run | i ip route
ip route 0.0.0.0 0.0.0.0 201.201.201.202          ip route 0.0.0.0 0.0.0.0 201.201.201.201
```

Verifying that it populated in the routing table

```
ISP#show ip route static                          routerxl#show ip route static
S*   0.0.0.0/0 [1/0] via 201.201.201.202           S*   0.0.0.0/0 [1/0] via 201.201.201.201
```

Verifying Connectivity By pinging the the isps interface and its web server:

```
routerxl#ping 201.201.201.201

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to
seconds:
!!!!!
Success rate is 100 percent (5/5),

routerxl#ping 202.202.202.100

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to
seconds:
.!!!!
Success rate is 80 percent (4/5),
```

7. Dynamic Routing

Router 1 Routing table alongside the specific commands I entered

```
routerx1#show ip route ospf
      172.16.0.0/16 is variably subnetted, 17 subnets, 5 masks
O        172.16.28.32 [110/66] via 172.16.28.194, 02:31:06, Serial0/0/1
O        172.16.28.64 [110/129] via 172.16.28.194, 02:32:31, Serial0/0/1
O        172.16.28.80 [110/129] via 172.16.28.194, 02:32:31, Serial0/0/1
O        172.16.28.96 [110/129] via 172.16.28.194, 02:32:31, Serial0/0/1
O        172.16.28.112 [110/66] via 172.16.28.194, 02:30:56, Serial0/0/1
O        172.16.28.128 [110/65] via 172.16.28.194, 02:32:06, Serial0/0/1
O        172.16.28.132 [110/65] via 172.16.28.194, 02:32:06, Serial0/0/1
O        172.16.28.144 [110/66] via 172.16.28.194, 02:30:56, Serial0/0/1
O        172.16.28.164 [110/128] via 172.16.28.194, 02:32:31, Serial0/0/1
O        172.16.28.202 [110/65] via 172.16.28.194, 02:32:31, Serial0/0/1
O        172.16.28.204 [110/129] via 172.16.28.194, 02:32:31, Serial0/0/1
O        172.16.28.210 [110/66] via 172.16.28.194, 02:31:56, Serial0/0/1
O        172.16.28.212 [110/66] via 172.16.28.194, 02:01:16, Serial0/0/1

routerx1#show run | include ?
  LINE  Regular expression.
routerx1#show run | include network
 network 172.16.28.0 0.0.0.31 area 0
 network 172.16.28.160 0.0.0.3 area 0
 network 172.16.28.192 0.0.0.7 area 0
 network 172.16.28.201 0.0.0.0 area 0
routerx1#show ip route
```

Layer Switch 2 Routing table alongside the specific commands I entered

```
L3xSwitchx2#show run | i area
 network 172.16.28.128 0.0.0.3 area 0
 network 172.16.28.32 0.0.0.31 area 0
 network 172.16.28.112 0.0.0.15 area 0
 network 172.16.28.144 0.0.0.15 area 0
 network 172.16.28.212 0.0.0.0 area 0
L3xSwitchx2#show ip route ospf
      172.16.0.0/16 is variably subnetted, 17 subnets, 5 masks
O        172.16.28.0 [110/130] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.64 [110/66] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.80 [110/66] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.96 [110/66] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.132 [110/2] via 172.16.28.34, 02:35:16, Vlan1
                       [110/2] via 172.16.28.114, 02:35:16, Vlan112
                       [110/2] via 172.16.28.146, 02:35:16, Vlan144
                       [110/2] via 172.16.28.129, 02:35:16, FastEthernet0/2
O        172.16.28.160 [110/129] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.164 [110/65] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.192 [110/1563] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.201 [110/130] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.202 [110/2] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.204 [110/66] via 172.16.28.129, 02:36:21, FastEthernet0/2
O        172.16.28.210 [110/2] via 172.16.28.34, 02:35:16, Vlan1
                       [110/2] via 172.16.28.114, 02:35:16, Vlan112
                       [110/2] via 172.16.28.146, 02:35:16, Vlan144
O*E2 0.0.0.0/0 [110/1] via 172.16.28.129, 02:36:21, FastEthernet0/2

L3xSwitchx2#
```

PCx0s traceroute to PCx1

```
Tracing route to 172.16.28.11 over a maximum of 30

1   0 ms      0 ms      0 ms       172.16.28.114
2   11 ms     0 ms      1 ms       172.16.28.129
3   1 ms      13 ms     1 ms       172.16.28.165
4   0 ms      1 ms      0 ms       172.16.28.193
5   2 ms      0 ms      11 ms      172.16.28.11
```

8. Default Route Injection

The command I entered

```
routerx1#show run | i default
 default-information originate
```

Verifying Population in Router 2 and 3

```
Serial0/0/0
O       172.16.28.212 [110/52] via 172.16.28.166, 02:43:00,
Serial0/0/0
O*E2 0.0.0.0/0 [110/1] via 172.16.28.161, 03:14:15, Serial0/0/1
```

```
O       172.16.28.210 [110/2] via 172.16.28.134, 03:14:19,
FastEthernet0/0
O       172.16.28.212 [110/2] via 172.16.28.130, 02:43:24,
FastEthernet0/1
O*E2 0.0.0.0/0 [110/1] via 172.16.28.165, 03:14:39, Serial0/0/1
```

Verifying connectivity to the web server from devices outside of router 1s lan

   PCx3 pinging Web Server and Trace Routing it

```
Pinging 202.202.202.100 with 32 bytes of data:

Reply from 202.202.202.100: bytes=32 time=1ms TTL=124
Reply from 202.202.202.100: bytes=32 time=1ms TTL=124
Reply from 202.202.202.100: bytes=32 time=1ms TTL=124
Reply from 202.202.202.100: bytes=32 time=9ms TTL=124

Ping statistics for 202.202.202.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 9ms, Average = 3ms

C:\>tracert 202.202.202.100

Tracing route to 202.202.202.100 over a maximum of 30 hops:

  1    1 ms      0 ms      0 ms      172.16.28.81
  2    4 ms      1 ms      2 ms      172.16.28.193
  3    1 ms      1 ms      1 ms      201.201.201.201
  4    1 ms      0 ms      1 ms      202.202.202.100
```
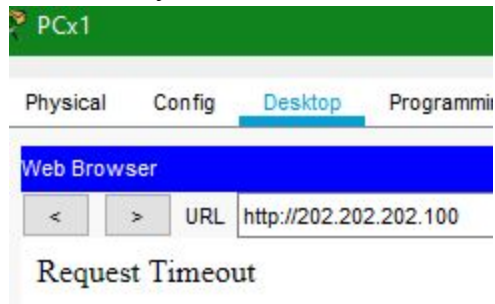
9. Access Control Lists

```
routerx1#show access
Extended IP access list DENYPC1WEB
    10 deny tcp host 172.16.28.11 host 202.202.202.100 eq www
    20 permit ip any any (12 match(es))
    30 permit tcp any any
```

Check to verify PCx1 cannot access the server via HTTP

Check to verify other devices can reach the server via HTTP

10. SSH

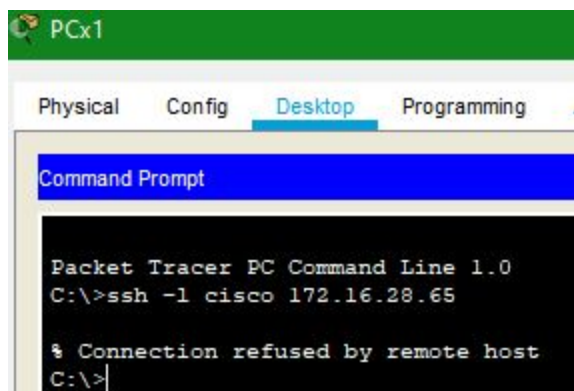Verify an SSH connection is established with PC4

```
routerx4#show ssh
Connection      Version Mode Encryption  Hmac State
Username
323             1.99    IN   aes128-cbc      hmac-sha1       Session
Started         cisco
323             1.99    OUT  aes128-cbc      hmac-sha1       Session
Started   cisco
```

Verify Telnet not being allowed

```
C:\>telnet 172.16.28.65
Trying 172.16.28.65 ...Open

[Connection to 172.16.28.65 closed by foreign host]
C:\>
```

Verify Other devices not being able to use SSH


```
Packet Tracer PC Command Line 1.0
C:\>ssh -l cisco 172.16.28.65

% Connection refused by remote host
C:\>
```

11. DHCP

Router 4 - Devices binded to dhcp - Pcx1 and Pcx3

```
routerx4#show ip dhcp binding
IP address         Client-ID/          Lease expiration       Type
                   Hardware address
172.16.28.68       0050.0F71.8383          --                 Automatic
172.16.28.11       0060.5C4C.E05E          --                 Automatic
routerx4#
```

Layer 3 Switch - Devices binded to dhcp - Pcx0 and Pcx2

```
L3xSwitchx2#show ip dhcp binding
IP address         Client-ID/          Lease expiration       Type
                   Hardware address
172.16.28.116      0002.4A97.9B51          --
Automatic
172.16.28.148      00D0.BA46.9B80          --
Automatic
L3xSwitchx2#
```

PCx0(top left),   Pcx2 (bottom left),   Pcx4 (top right),   Pcx1 (bottom right)
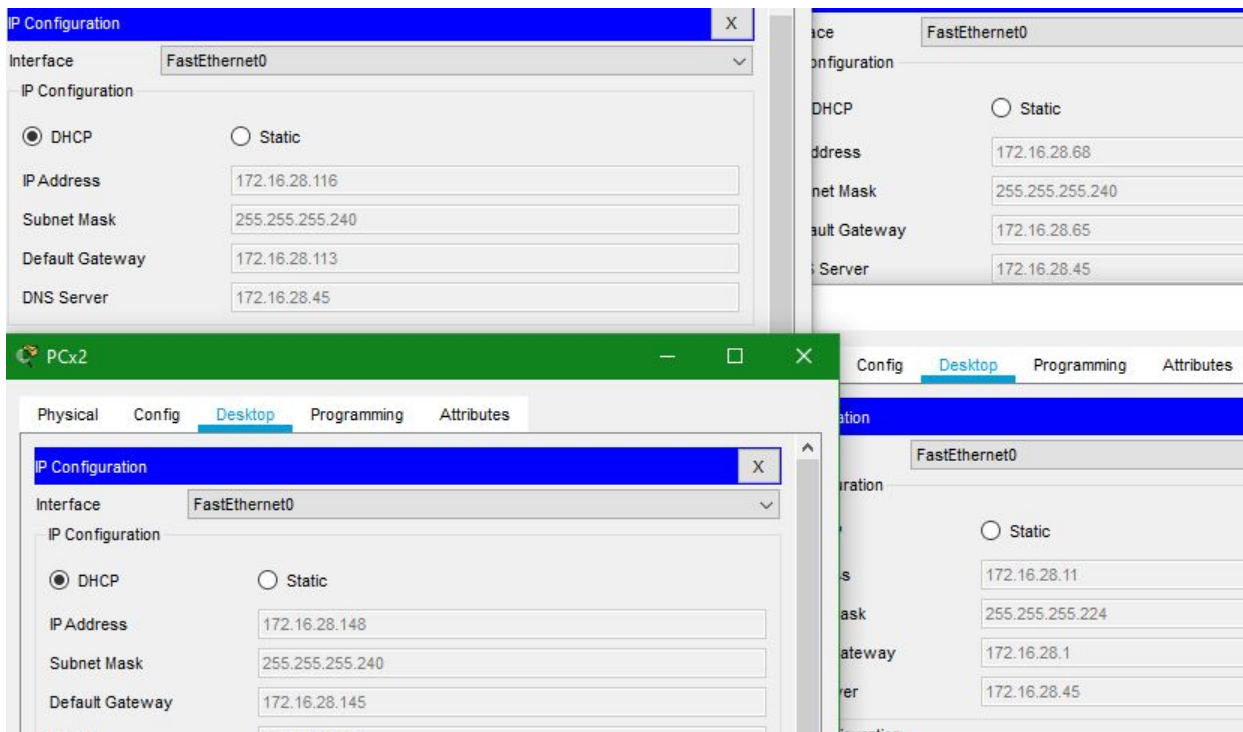
12. DNS

Dns servers populated records and cnames

No.	Name	Type	
0	dns-server	CNAME	dns-server-inetlab.local
1	dns-server-inetlab.local	A Record	172.16.28.45
2	isp-inetlab.local	A Record	20.20.20.20
3	l3switchx0-inetlab.local	A Record	172.16.28.210
4	l3switchx2-inetlab.local	A Record	172.16.28.212
5	pcx0	CNAME	pxc0-inetlab.local
6	pcx1	CNAME	pxc1-inetlab.local
7	pcx2	CNAME	pxc2-inetlab.local
8	pxc0-inetlab.local	A Record	172.16.28.116
9	pxc1-inetlab.local	A Record	172.16.28.11
10	pxc2-inetlab.local	A Record	172.16.28.148
11	pxc4-inetlab.local	A Record	172.16.28.84

Verifying a cname and a record connectivity:

```
C:\>ping pcx0

Pinging 172.16.28.116 with 32 bytes of data:

Reply from 172.16.28.116: bytes=32 time=1ms TTL=128
Reply from 172.16.28.116: bytes=32 time<1ms TTL=128
Reply from 172.16.28.116: bytes=32 time=1ms TTL=128
Reply from 172.16.28.116: bytes=32 time<1ms TTL=128

Ping statistics for 172.16.28.116:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping router4-inetlab.local

Pinging 172.16.28.204 with 32 bytes of data:

Reply from 172.16.28.204: bytes=32 time=1ms TTL=253
Reply from 172.16.28.204: bytes=32 time=1ms TTL=253
Reply from 172.16.28.204: bytes=32 time=3ms TTL=253
Reply from 172.16.28.204: bytes=32 time=1ms TTL=253
```

PCx2 pinging DNS server

```
C:\>ping 172.16.28.45

Pinging 172.16.28.45 with 32 bytes of data:

Request timed out.
Reply from 172.16.28.45: bytes=32 time<1ms TTL=127
Reply from 172.16.28.45: bytes=32 time=1ms TTL=127
Reply from 172.16.28.45: bytes=32 time<1ms TTL=127

Ping statistics for 172.16.28.45:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

13. PAT

Access list permitting all networks

```
Standard IP access list 20
    10 permit 172.16.28.192 0.0.0.7
    20 permit 172.16.28.160 0.0.0.3
    30 permit 172.16.28.164 0.0.0.3
    40 permit 172.16.28.0 0.0.0.31 (2 match(es))
    50 permit 172.16.28.96 0.0.0.15
    60 permit 172.16.28.64 0.0.0.15 (2 match(es))
    70 permit 172.16.28.80 0.0.0.15 (28 match(es))
    80 permit 172.16.28.132 0.0.0.3
    90 permit 172.16.28.128 0.0.0.3
    100 permit 172.16.28.32 0.0.0.31
    110 permit 172.16.28.112 0.0.0.15
    120 permit 172.16.28.144 0.0.0.15
    130 deny any (21 match(es))
```

Show nat pool statistics

```
routerx1#show ip nat statistics
Total translations: 1 (0 static, 1 dynamic, 1 extended)
Outside Interfaces: FastEthernet0/1
Inside Interfaces: FastEthernet0/0 , Serial0/0/0 , Serial0/0/1
Hits: 21  Misses: 120
Expired translations: 15
Dynamic mappings:
-- Inside Source
access-list 20 pool NETWORKPOOL refCount 1
 pool NETWORKPOOL: netmask 255.255.255.248
        start 201.201.201.203 end 201.201.201.206
        type generic, total addresses 4 , allocated 1 (25%), misses 0
routerx1#
```

Show nat translations

```
routerx1#show ip nat translations
Pro  Inside global     Inside local       Outside local     Outside
global
icmp 201.201.201.203:13172.16.28.68:13    202.202.202.100:13
202.202.202.100:13
icmp 201.201.201.203:14172.16.28.68:14    202.202.202.100:14
202.202.202.100:14
icmp 201.201.201.203:15172.16.28.68:15    202.202.202.100:15
202.202.202.100:15
icmp 201.201.201.203:16172.16.28.68:16    202.202.202.100:16
202.202.202.100:16
icmp 201.201.201.203:17172.16.28.148:17   202.202.202.100:17
202.202.202.100:17
icmp 201.201.201.203:18172.16.28.148:18   202.202.202.100:18
202.202.202.100:18
icmp 201.201.201.203:19172.16.28.148:19   202.202.202.100:19
202.202.202.100:19
icmp 201.201.201.203:20172.16.28.148:20   202.202.202.100:20
202.202.202.100:20
tcp 201.201.201.203:1025172.16.28.68:1025  202.202.202.100:80
202.202.202.100:80
```

14. HSRP

Layer 3 Switch 0

```
L3xSwitchx0#show standby brief
                     P indicates configured to preempt.
                     |
Interface   Grp  Pri P State    Active          Standby         Virtual IP
V11         1    200 P Active   local           172.16.28.35    172.16.28.33
V1112       12   200 P Active   local           172.16.28.115   172.16.28.113
V1144       144  100   Standby  172.16.28.147   local           172.16.28.145
L3xSwitchx0#
```

Layer 3 Switch 2

```
L3xSwitchx2#show standby brief
                     P indicates configured to preempt.
                     |
Interface   Grp  Pri P State    Active          Standby         Virtual IP
V11         1    100   Standby  172.16.28.34    local           172.16.28.33
V1112       12   100   Standby  172.16.28.114   local           172.16.28.113
V1144       144  200 P Active   local           172.16.28.146   172.16.28.145
L3xSwitchx2#
```

Pcx0 pinging VIPS

```
C:\>ping 172.16.28.113

Pinging 172.16.28.113 with 32 bytes of data:

Reply from 172.16.28.113: bytes=32 time<1ms TTL=255
Reply from 172.16.28.113: bytes=32 time<1ms TTL=255
Reply from 172.16.28.113: bytes=32 time<1ms TTL=255
Reply from 172.16.28.113: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.28.113:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 172.16.28.147

Pinging 172.16.28.147 with 32 bytes of data:

Reply from 172.16.28.147: bytes=32 time=1ms TTL=255
Reply from 172.16.28.147: bytes=32 time<1ms TTL=255
Reply from 172.16.28.147: bytes=32 time<1ms TTL=255
Reply from 172.16.28.147: bytes=32 time<1ms TTL=255
```

15. Routed Switch Interfaces

Layer 3 Switch 0 interface status

```
L3xSwitchx0#show int status
Port        Name                  Status       Vlan      Duplex  Speed Type
Po1                               notconnect   1         auto    auto
Po2                               connected    1         auto    auto
Fa0/1                             connected    routed    auto    auto  10/10
```

Layer 3 Switch 2 interface status

```
L3xSwitchx2#show int status
Port        Name                  Status       Vlan      Duplex  Speed Type
Po1                               connected    1         auto    auto
Fa0/1                             notconnect   1         auto    auto  10/10
Fa0/2                             connected    routed    auto    auto  10/10
```

Command I entered - No Switchport

```
interface FastEthernet0/2
 no switchport
 ip address 172.16.28.130 255.255.255.252
```

16. VTP

Layer 3 Switch 2 VTP status

```
L3xSwitchx2(config)#do show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 2
VTP Domain Name                 : Server1
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 0002.17E7.2400
Configuration last modified by 172.16.28.35 at 3-1-93 00:28:17
Local updater ID is 172.16.28.35 on interface Vl1 (lowest numbered VLAN interface

Feature VLAN :
--------------
VTP Operating Mode              : Server
Maximum VLANs supported locally : 1005
Number of existing VLANs        : 7
Configuration Revision          : 68
MD5 digest                      : 0x00 0x49 0x68 0x41 0x06 0x42 0x66 0x9D
                                  0xAE 0xB1 0xE2 0xA4 0x20 0x8B 0x1B 0xD7
```

Layer 3 Switch 0 VTP status

```
L3xSwitchx0#show vtp status
VTP Version capable             : 1 to 2
VTP version running             : 2
VTP Domain Name                 : Server1
VTP Pruning Mode                : Disabled
VTP Traps Generation            : Disabled
Device ID                       : 000C.CFAD.7E30
Configuration last modified by 172.16.28.34 at 3-1-93 00:28:39
Local updater ID is 172.16.28.34 on interface Vl1 (lowest numbered
VLAN interface found)

Feature VLAN :
--------------
VTP Operating Mode              : Server
Maximum VLANs supported locally : 1005
Number of existing VLANs        : 7
Configuration Revision          : 68
MD5 digest                      : 0xAD 0xD4 0xD5 0xB8 0xF4 0x9D
0x8F 0x44
                                  0xAC 0x38 0xA7 0xA7 0xFB 0x5A
0x29 0x35
```

Layer 2 Switch 0 VTP status and Password *

```
Switchx0#show vtp status
VTP Version                     : 2
Configuration Revision          : 68
Maximum VLANs supported locally : 255
Number of existing VLANs        : 7
VTP Operating Mode              : Client
VTP Domain Name                 : Server1
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xAD 0xD4 0xD5
0x44
Configuration last modified by 172.16.28.34 at 3-
Switchx0#show vtp ?
  counters  VTP statistics
  password  VTP password
  status    VTP domain status
Switchx0#show vtp password
VTP Password: cisco
```