Huawei Network Administrator

Group Name:
R3_DEPI3_ONL3_ISS5_S2 Huawei Network Administrator

Team Members

Mina Estfanous	21026681
Ahmed Mahmoud	21020112
Abdallah Essam	21040042
Mohamed Bakr	21043984
Omar Elnahas	21040042

Enterprise Network Design and Configuration Report

Project Overview

This project builds a multi-site enterprise design.
The topology uses:

- ISP router
- HQ router
- Firewall
- Core1 and Core2 switches
- Department VLANs
- OSPF routing
- Private link between HQ and Firewall
- Public link between ISP and HQ

Your goals:

- Route traffic between all networks
- Secure inbound and outbound traffic
- Test reachability end-to-end
- Validate configuration using show commands

Network Topology Summary

Routers

ISP Router

- GE0/0/0 → HQ (public link)
- GE0/0/1 → Internet cloud

HQ Router

- GE0/0/1 → ISP
- GE0/0/0 → Firewall
- VLAN interfaces for departments if needed

Firewall

- GE0/0/0 → HQ
- GE0/0/2 → CORE2
- Has zones, policies, and NAT

Switches

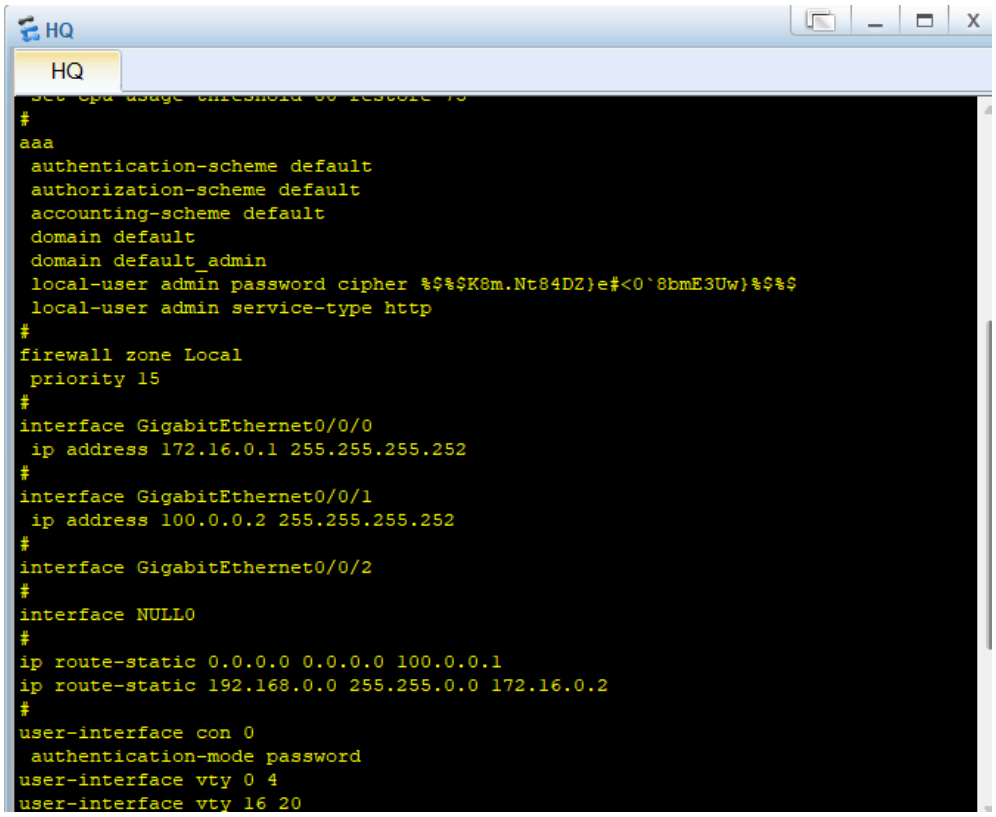
CORE1

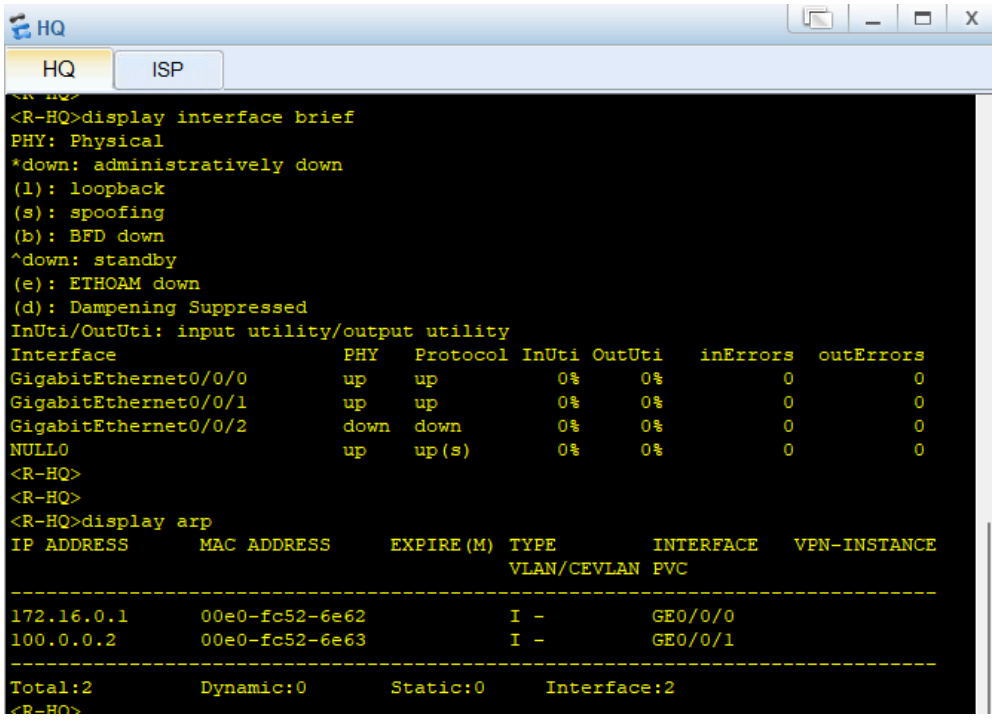
- VLAN 10, 20
- Gateway 192.168.10.1, 192.168.20.1
- Uplink to HQ

CORE2

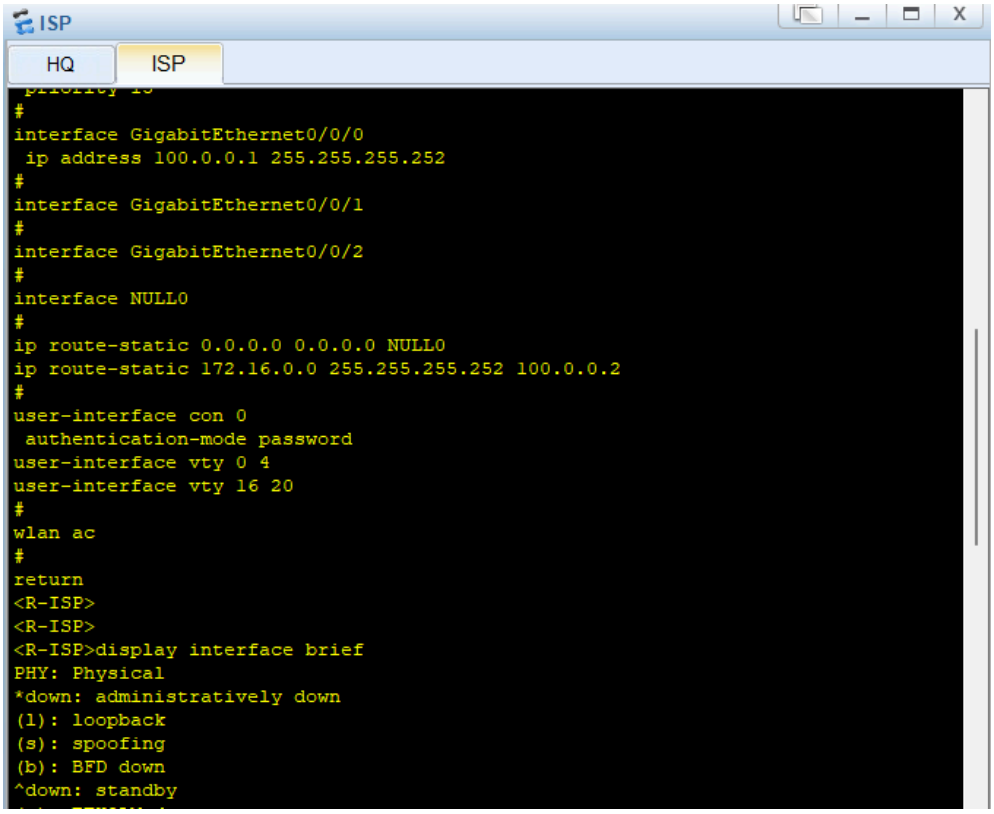
- VLAN 50, 60, 99, 101
- Gateway 192.168.50.1, .60.1, .99.2, .101
- Uplink to Firewall

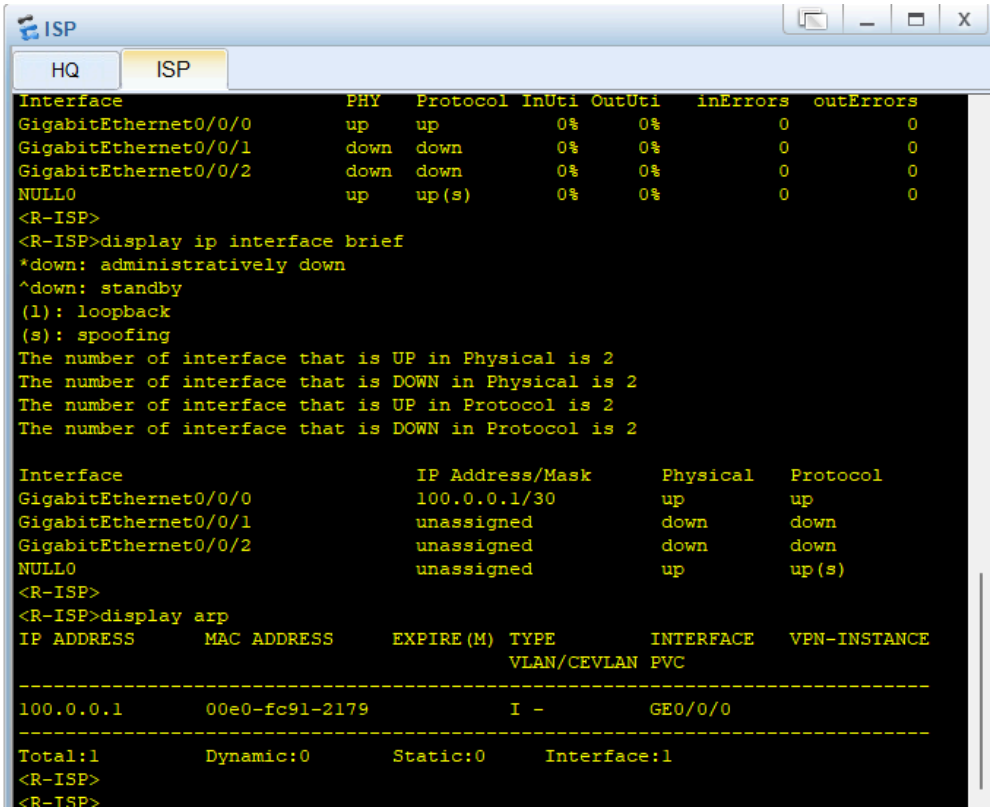
HQ Router Re-Configuration


HQ
HQ
#
aaa
 authentication-scheme default
 authorization-scheme default
 accounting-scheme default
 domain default
 domain default_admin
 local-user admin password cipher %$%$K8m.Nt84DZ}e#<0`8bmE3Uw}%$%$
 local-user admin service-type http
#
firewall zone Local
 priority 15
#
interface GigabitEthernet0/0/0
 ip address 172.16.0.1 255.255.255.252
#
interface GigabitEthernet0/0/1
 ip address 100.0.0.2 255.255.255.252
#
interface GigabitEthernet0/0/2
#
interface NULL0
#
ip route-static 0.0.0.0 0.0.0.0 100.0.0.1
ip route-static 192.168.0.0 255.255.0.0 172.16.0.2
#
user-interface con 0
 authentication-mode password
user-interface vty 0 4
user-interface vty 16 20

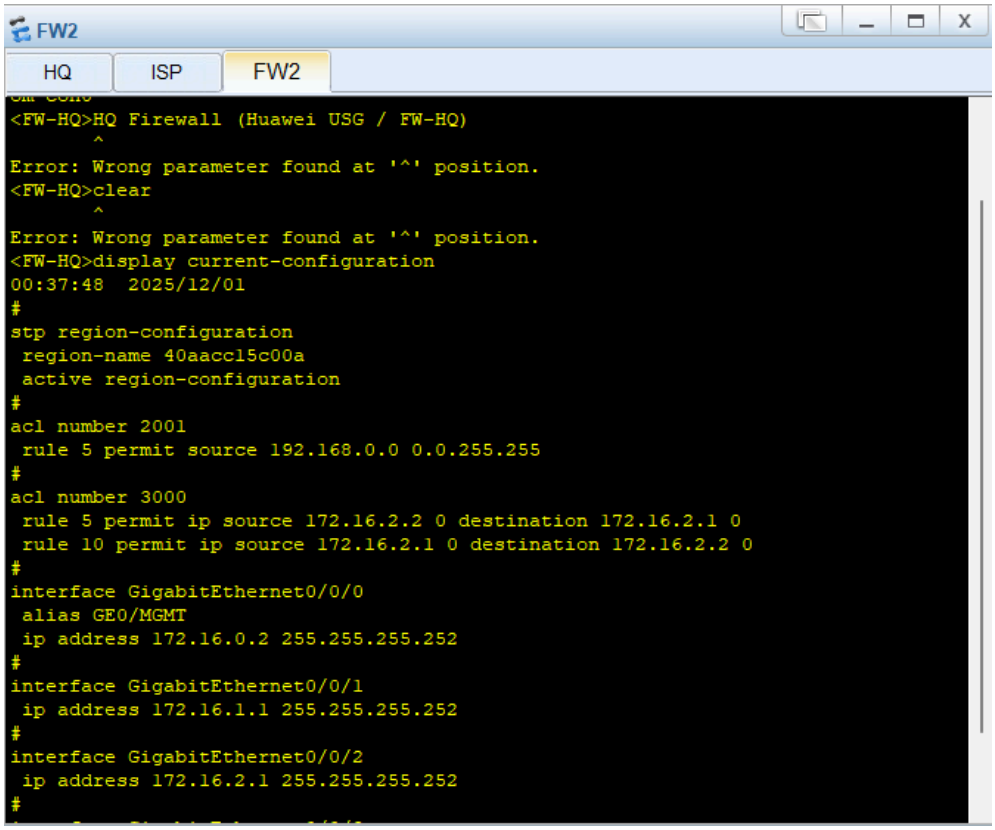

HQ
HQ
ISP
<R-HQ>display interface brief
PHY: Physical
*down: administratively down
(l): loopback
(s): spoofing
(b): BFD down
^down: standby
(e): ETHOAM down
(d): Dampening Suppressed
InUti/OutUti: input utility/output utility
Interface PHY Protocol InUti OutUti inErrors outErrors
GigabitEthernet0/0/0 up up 0% 0% 0 0
GigabitEthernet0/0/1 up up 0% 0% 0 0
GigabitEthernet0/0/2 down down 0% 0% 0 0
NULL0 up up(s) 0% 0% 0 0
<R-HQ>
<R-HQ>
<R-HQ>display arp
IP ADDRESS MAC ADDRESS EXPIRE(M) TYPE INTERFACE VPN-INSTANCE
VLAN/CEVLAN PVC
172.16.0.1 00e0-fc52-6e62 I - GE0/0/0
100.0.0.2 00e0-fc52-6e63 I - GE0/0/1
Total:2 Dynamic:0 Static:0 Interface:2

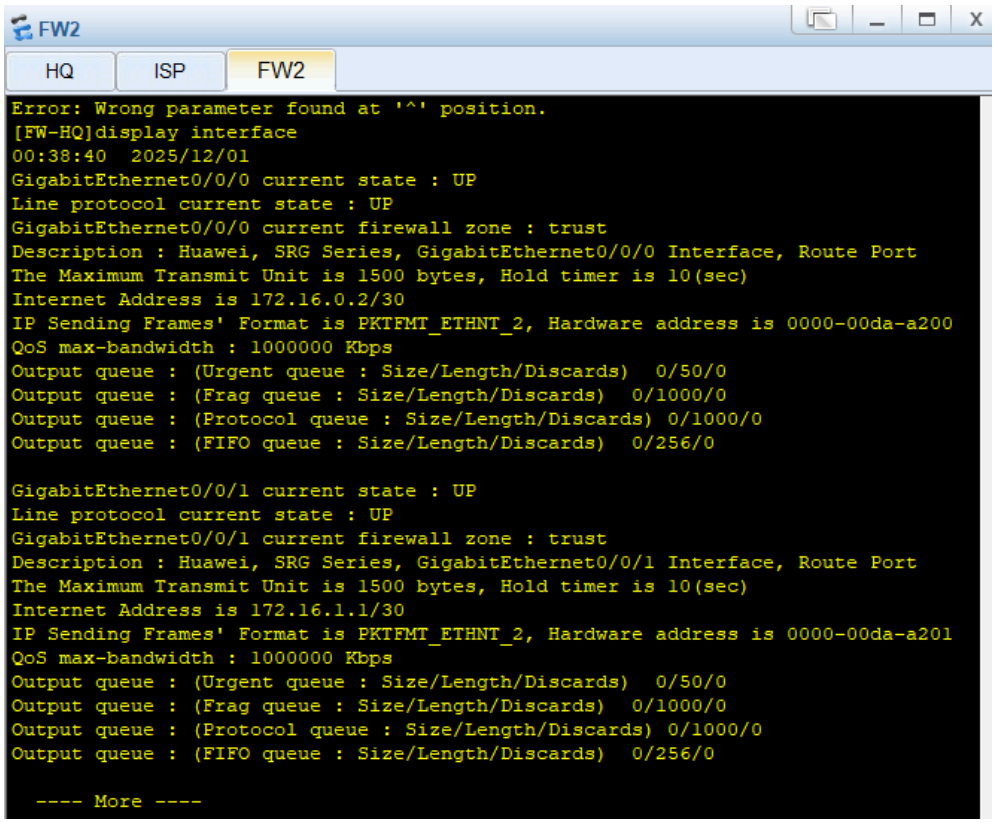
ISP Router


ISP
HQ
ISP
#
interface GigabitEthernet0/0/0
ip address 100.0.0.1 255.255.255.252
#
interface GigabitEthernet0/0/1
#
interface GigabitEthernet0/0/2
#
interface NULL0
#
ip route-static 0.0.0.0 0.0.0.0 NULL0
ip route-static 172.16.0.0 255.255.255.252 100.0.0.2
#
user-interface con 0
authentication-mode password
user-interface vty 0 4
user-interface vty 16 20
#
wlan ac
#
return
<R-ISP>
<R-ISP>
<R-ISP>display interface brief
PHY: Physical
*down: administratively down
(l): loopback
(s): spoofing
(b): BFD down
^down: standby



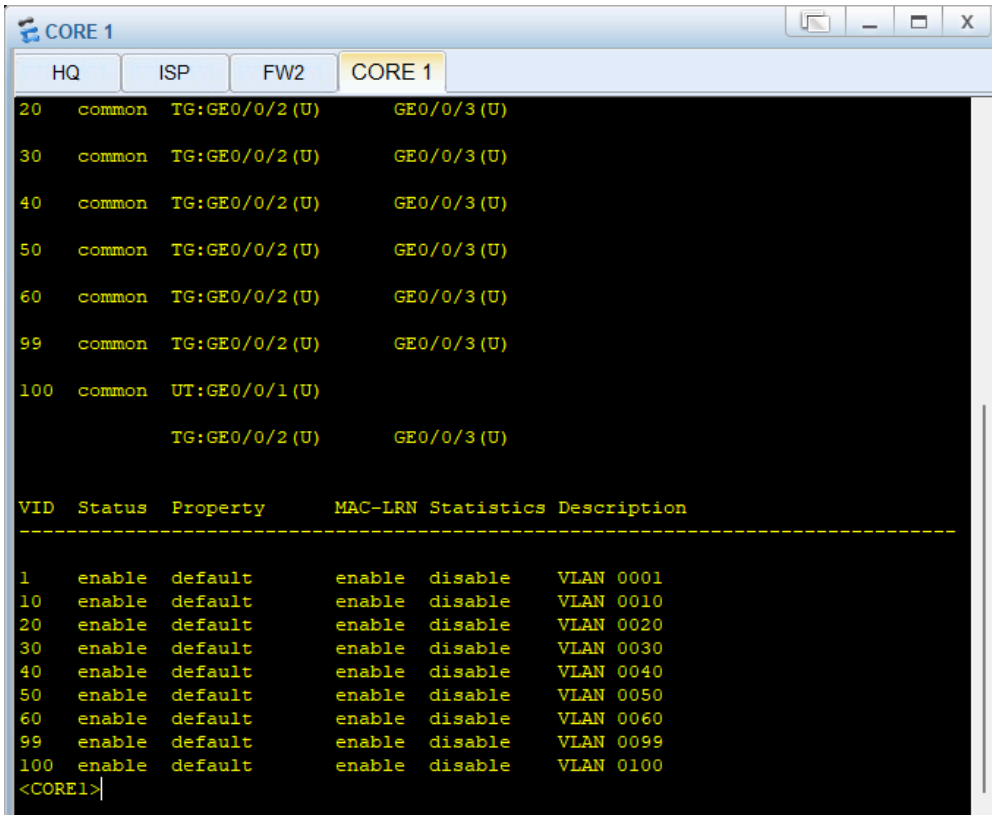
HQ Firewall (Huawei USG / FW-HQ)


FW2
HQ
ISP
FW2
<FW-HQ>HQ Firewall (Huawei USG / FW-HQ)
^
Error: Wrong parameter found at '^' position.
<FW-HQ>clear
^
Error: Wrong parameter found at '^' position.
<FW-HQ>display current-configuration
00:37:48 2025/12/01
#
stp region-configuration
region-name 40aacc15c00a
active region-configuration
#
acl number 2001
rule 5 permit source 192.168.0.0 0.0.255.255
#
acl number 3000
rule 5 permit ip source 172.16.2.2 0 destination 172.16.2.1 0
rule 10 permit ip source 172.16.2.1 0 destination 172.16.2.2 0
#
interface GigabitEthernet0/0/0
alias GE0/MGMT
ip address 172.16.0.2 255.255.255.252
#
interface GigabitEthernet0/0/1
ip address 172.16.1.1 255.255.255.252
#
interface GigabitEthernet0/0/2
ip address 172.16.2.1 255.255.255.252
#


FW2
HQ
ISP
FW2
Error: Wrong parameter found at '^' position.
[FW-HQ]display interface
00:38:40 2025/12/01
GigabitEthernet0/0/0 current state : UP
Line protocol current state : UP
GigabitEthernet0/0/0 current firewall zone : trust
Description : Huawei, SRG Series, GigabitEthernet0/0/0 Interface, Route Port
The Maximum Transmit Unit is 1500 bytes, Hold timer is 10(sec)
Internet Address is 172.16.0.2/30
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 0000-00da-a200
QoS max-bandwidth : 1000000 Kbps
Output queue : (Urgent queue : Size/Length/Discards) 0/50/0
Output queue : (Frag queue : Size/Length/Discards) 0/1000/0
Output queue : (Protocol queue : Size/Length/Discards) 0/1000/0
Output queue : (FIFO queue : Size/Length/Discards) 0/256/0
GigabitEthernet0/0/1 current state : UP
Line protocol current state : UP
GigabitEthernet0/0/1 current firewall zone : trust
Description : Huawei, SRG Series, GigabitEthernet0/0/1 Interface, Route Port
The Maximum Transmit Unit is 1500 bytes, Hold timer is 10(sec)
Internet Address is 172.16.1.1/30
IP Sending Frames' Format is PKTFMT_ETHNT_2, Hardware address is 0000-00da-a201
QoS max-bandwidth : 1000000 Kbps
Output queue : (Urgent queue : Size/Length/Discards) 0/50/0
Output queue : (Frag queue : Size/Length/Discards) 0/1000/0
Output queue : (Protocol queue : Size/Length/Discards) 0/1000/0
Output queue : (FIFO queue : Size/Length/Discards) 0/256/0
---- More ----

CORE1 / CORE2 Switches

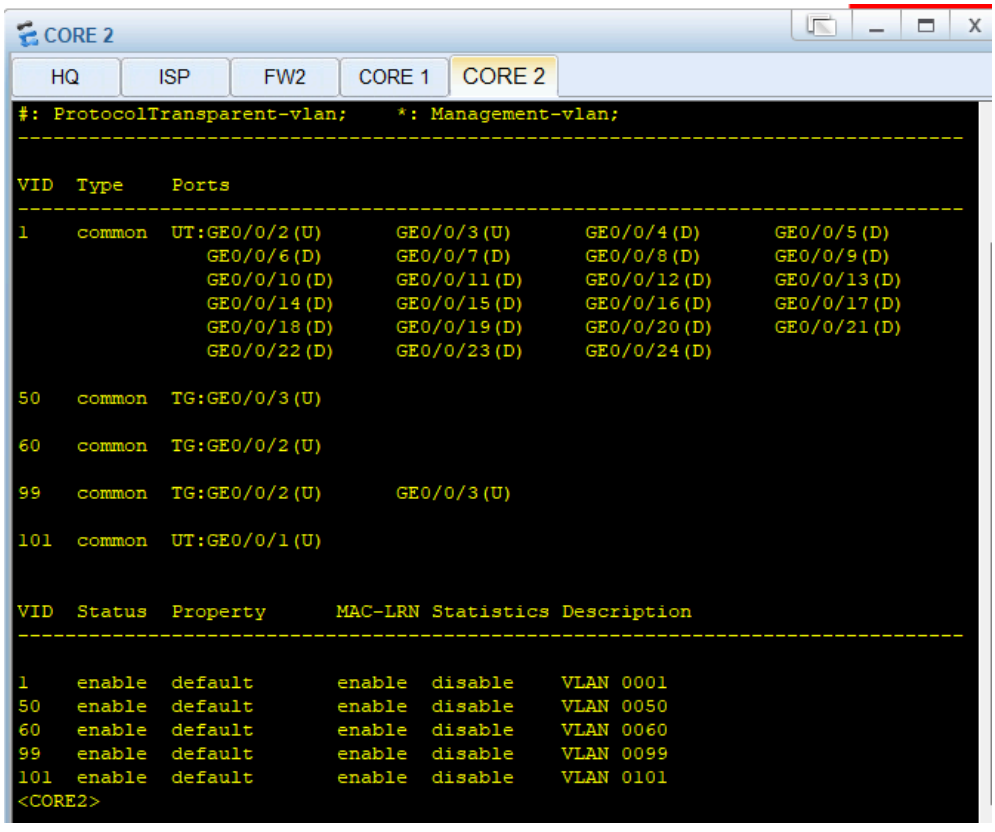
Core 1:




```
<CORE1>display stp brief
 MSTID  Port                        Role  STP State     Protection
   0    GigabitEthernet0/0/1        DESI  FORWARDING      NONE
   0    GigabitEthernet0/0/2        DESI  FORWARDING      NONE
   0    GigabitEthernet0/0/3        ROOT  FORWARDING      NONE
<CORE1>
```

```
<CORE1>display ospf routing

      OSPF Process 1 with Router ID 192.168.10.1
            Routing Tables

 Routing for Network
 Destination        Cost  Type       NextHop         AdvRouter       Area
 172.16.1.0/30      1     Transit    172.16.1.2      192.168.10.1    0.0.0.0
 192.168.10.0/24    1     Stub       192.168.10.1    192.168.10.1    0.0.0.0
 192.168.20.0/24    1     Stub       192.168.20.1    192.168.10.1    0.0.0.0
 192.168.30.0/24    1     Stub       192.168.30.1    192.168.10.1    0.0.0.0
 192.168.40.0/24    1     Stub       192.168.40.1    192.168.10.1    0.0.0.0
 192.168.99.0/24    1     Stub       192.168.99.1    192.168.10.1    0.0.0.0
 172.16.0.0/30      2     Stub       172.16.1.1      172.16.2.1      0.0.0.0
 172.16.2.0/30      2     Stub       172.16.1.1      172.16.2.1      0.0.0.0

 Total Nets: 8
 Intra Area: 8  Inter Area: 0  ASE: 0  NSSA: 0
```

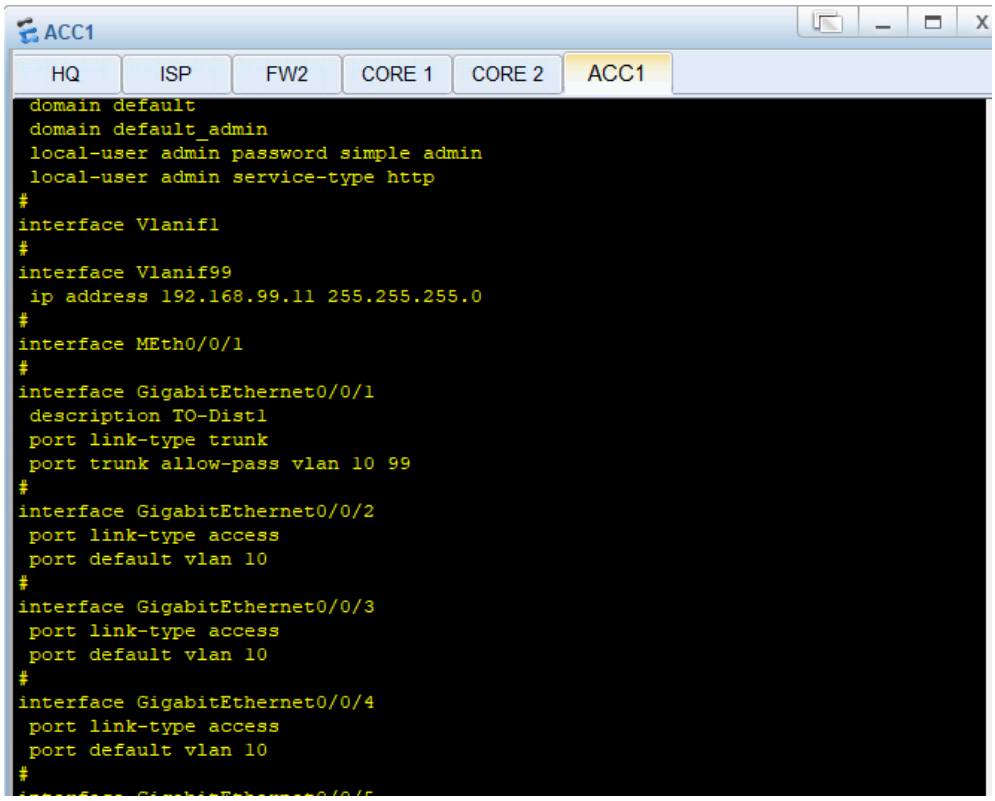
Core 2:

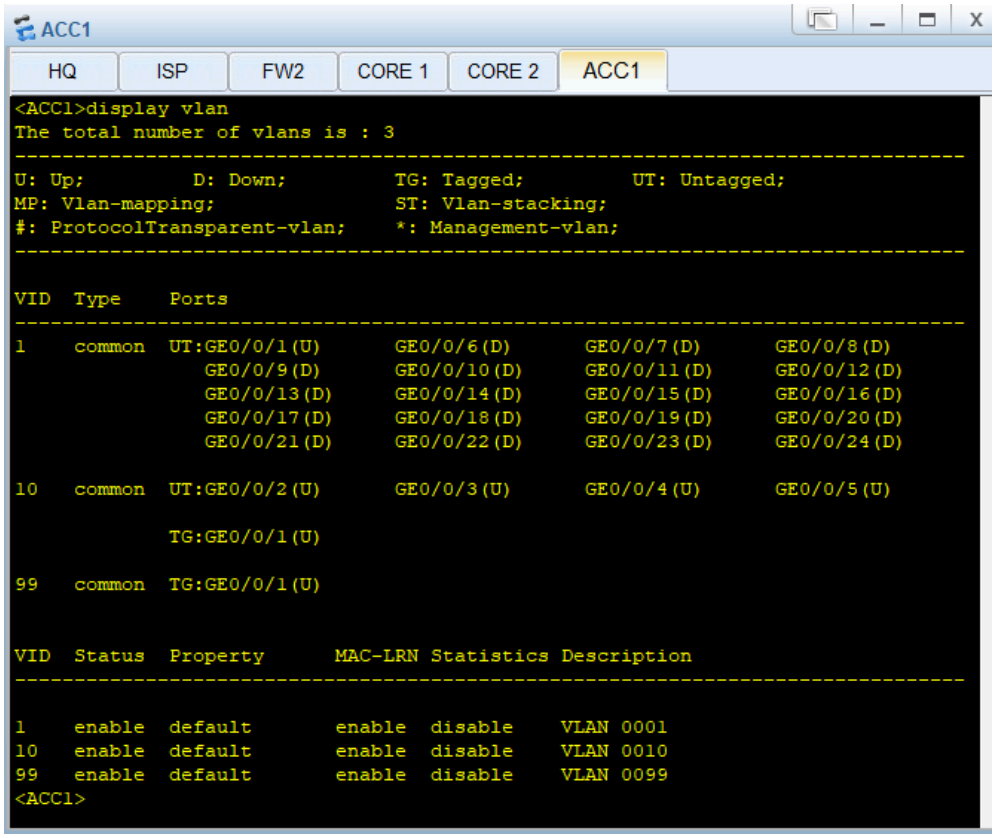



```
<CORE2>display stp brief
 MSTID  Port                        Role  STP State     Protection
   0    GigabitEthernet0/0/1        DESI  FORWARDING      NONE
   0    GigabitEthernet0/0/2        DESI  FORWARDING      NONE
   0    GigabitEthernet0/0/3        DESI  FORWARDING      NONE
<CORE2>
```

```
<CORE2>display ospf routing

       OSPF Process 1 with Router ID 192.168.50.1
              Routing Tables

 Routing for Network
 Destination        Cost  Type       NextHop         AdvRouter       Area
 172.16.2.0/30      1     Stub       172.16.2.2      192.168.50.1    0.0.0.0
 192.168.50.0/24    1     Stub       192.168.50.1    192.168.50.1    0.0.0.0
 192.168.60.0/24    1     Stub       192.168.60.1    192.168.50.1    0.0.0.0
 192.168.99.0/24    1     Stub       192.168.99.2    192.168.50.1    0.0.0.0

 Total Nets: 4
 Intra Area: 4  Inter Area: 0  ASE: 0  NSSA: 0
```

Access Switches






```
<ACC1>display mac-address
MAC address table of slot 0:
-------------------------------------------------------------------------------
MAC Address    VLAN/       PEVLAN CEVLAN Port            Type      LSP/LSR-ID
               VSI/SI                                              MAC-Tunnel
-------------------------------------------------------------------------------
4c1f-cc14-1213 99          -      -      GE0/0/1         dynamic   0/-
4c1f-ccaa-15f9 10          -      -      GE0/0/1         dynamic   0/-
4c1f-ccaa-15f9 99          -      -      GE0/0/1         dynamic   0/-
4c1f-ccfb-7725 99          -      -      GE0/0/1         dynamic   0/-
4c1f-cc7a-4f34 99          -      -      GE0/0/1         dynamic   0/-
4c1f-cc2c-601f 99          -      -      GE0/0/1         dynamic   0/-
4c1f-cc43-552b 99          -      -      GE0/0/1         dynamic   0/-
-------------------------------------------------------------------------------
Total matching items on slot 0 displayed = 7
```

Ping tests:

From ISP Router:

```
<R-ISP>ping 100.0.0.2
  PING 100.0.0.2: 56  data bytes, press CTRL_C to break
    Reply from 100.0.0.2: bytes=56 Sequence=1 ttl=255 time=70 ms
    Reply from 100.0.0.2: bytes=56 Sequence=2 ttl=255 time=10 ms
    Reply from 100.0.0.2: bytes=56 Sequence=3 ttl=255 time=10 ms
    Reply from 100.0.0.2: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 100.0.0.2: bytes=56 Sequence=5 ttl=255 time=30 ms

  --- 100.0.0.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 10/28/70 ms

<R-ISP>
```

```
<R-ISP>ping 172.16.0.1
  PING 172.16.0.1: 56  data bytes, press CTRL_C to break
    Reply from 172.16.0.1: bytes=56 Sequence=1 ttl=255 time=20 ms
    Reply from 172.16.0.1: bytes=56 Sequence=2 ttl=255 time=20 ms
    Reply from 172.16.0.1: bytes=56 Sequence=3 ttl=255 time=10 ms
    Reply from 172.16.0.1: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 172.16.0.1: bytes=56 Sequence=5 ttl=255 time=20 ms

  --- 172.16.0.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 10/18/20 ms
```

From HQ Router:

```
<R-HQ>ping 100.0.0.1
  PING 100.0.0.1: 56  data bytes, press CTRL_C to break
    Reply from 100.0.0.1: bytes=56 Sequence=1 ttl=255 time=20 ms
    Reply from 100.0.0.1: bytes=56 Sequence=2 ttl=255 time=20 ms
    Reply from 100.0.0.1: bytes=56 Sequence=3 ttl=255 time=30 ms
    Reply from 100.0.0.1: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 100.0.0.1: bytes=56 Sequence=5 ttl=255 time=20 ms

  --- 100.0.0.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/22/30 ms
```

```
<R-HQ>ping 172.16.0.2
  PING 172.16.0.2: 56  data bytes, press CTRL_C to break
    Reply from 172.16.0.2: bytes=56 Sequence=1 ttl=255 time=30 ms
    Reply from 172.16.0.2: bytes=56 Sequence=2 ttl=255 time=290 ms
    Reply from 172.16.0.2: bytes=56 Sequence=3 ttl=255 time=50 ms
    Reply from 172.16.0.2: bytes=56 Sequence=4 ttl=255 time=300 ms
    Reply from 172.16.0.2: bytes=56 Sequence=5 ttl=255 time=20 ms

  --- 172.16.0.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/138/300 ms
```

From Firewall:

```
[FW-HQ]ping 172.16.0.1
00:46:21  2025/12/01
  PING 172.16.0.1: 56  data bytes, press CTRL_C to break
    Reply from 172.16.0.1: bytes=56 Sequence=1 ttl=255 time=60 ms
    Reply from 172.16.0.1: bytes=56 Sequence=2 ttl=255 time=80 ms
    Reply from 172.16.0.1: bytes=56 Sequence=3 ttl=255 time=160 ms
    Reply from 172.16.0.1: bytes=56 Sequence=4 ttl=255 time=110 ms
    Reply from 172.16.0.1: bytes=56 Sequence=5 ttl=255 time=80 ms

  --- 172.16.0.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 60/98/160 ms
```

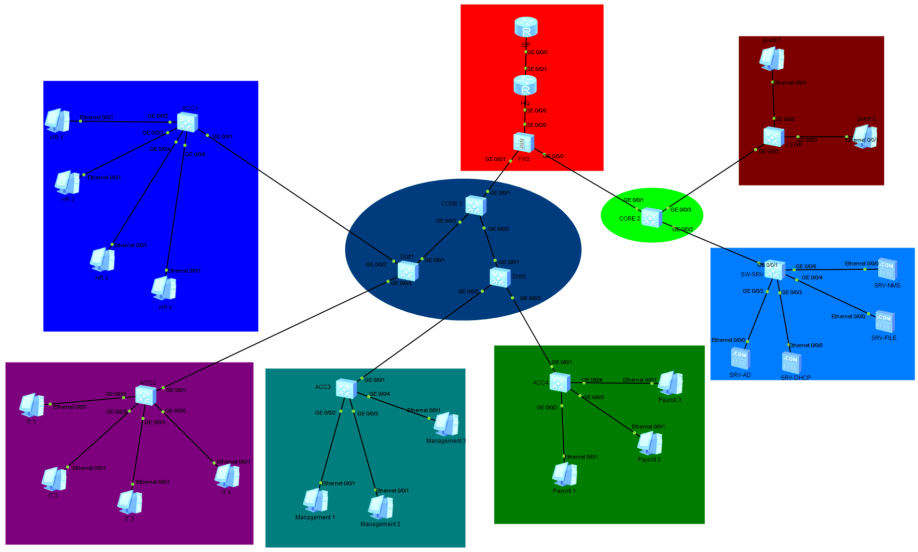
```
[FW-HQ]ping 172.16.1.2
00:46:35  2025/12/01
  PING 172.16.1.2: 56  data bytes, press CTRL_C to break
    Reply from 172.16.1.2: bytes=56 Sequence=1 ttl=255 time=120 ms
    Reply from 172.16.1.2: bytes=56 Sequence=2 ttl=255 time=100 ms
    Reply from 172.16.1.2: bytes=56 Sequence=3 ttl=255 time=80 ms
    Reply from 172.16.1.2: bytes=56 Sequence=4 ttl=255 time=70 ms
    Reply from 172.16.1.2: bytes=56 Sequence=5 ttl=255 time=30 ms

  --- 172.16.1.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 30/80/120 ms
```

From Cores:

```
<CORE1>ping 192.168.10.1
  PING 192.168.10.1: 56  data bytes, press CTRL_C to break
    Reply from 192.168.10.1: bytes=56 Sequence=1 ttl=255 time=40 ms
    Reply from 192.168.10.1: bytes=56 Sequence=2 ttl=255 time=10 ms
    Reply from 192.168.10.1: bytes=56 Sequence=3 ttl=255 time=30 ms
    Reply from 192.168.10.1: bytes=56 Sequence=4 ttl=255 time=1 ms
    Reply from 192.168.10.1: bytes=56 Sequence=5 ttl=255 time=30 ms

  --- 192.168.10.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 1/22/40 ms

<CORE1>
```

Devices:

```
PC>ping 192.168.10.12

Ping 192.168.10.12: 32 data bytes, Press Ctrl_C to break
From 192.168.10.12: bytes=32 seq=1 ttl=128 time=47 ms
From 192.168.10.12: bytes=32 seq=2 ttl=128 time=31 ms
From 192.168.10.12: bytes=32 seq=3 ttl=128 time=47 ms
From 192.168.10.12: bytes=32 seq=4 ttl=128 time=47 ms
From 192.168.10.12: bytes=32 seq=5 ttl=128 time=31 ms

--- 192.168.10.12 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 31/40/47 ms
```


IR
GE 0/0/0
GE 0/0/1
IR
GE 0/0/0
GE 0/0/9
IR
GE 0/0/1
F3/2
F3/2
CORE 1
CORE 2
SW-SRV
SRV-NMS
SRV-FILE
SRV-AD
SRV-DHCP
ACC1
ACC2
ACC3
ACC4
IT 1
IT 2
IT 3
IT 4
Management 1
Management 2
Management 3
Payroll 1
Payroll 2
Payroll 3