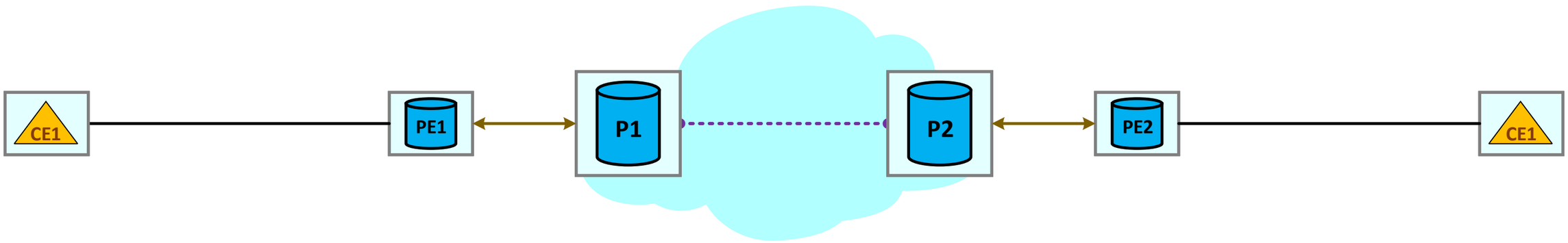
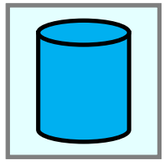
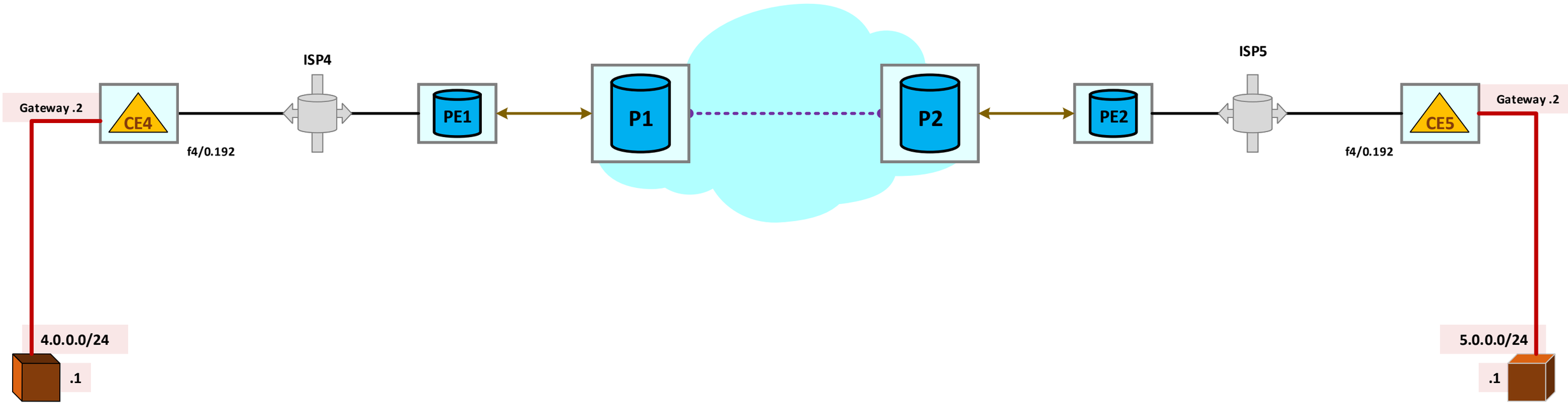

CE1
PE1
P1
P2
PE2
CE1




ISP4
ISP5
Gateway .2
CE4
f4/0.192
PE1
P1
P2
PE2
CE5
f4/0.192
Gateway .2
4.0.0.0/24
.1
5.0.0.0/24
.1

MPLS Core:
P to P Label Switching

P3

PA

P4

P1

PB

P2

PEx

PEy

PE1

PE2

PROVIDER ROUTING:
PE to P
PE ro PE

Customer
Access
Trunk

ISP4

ISP5

NO ROUTING:
Tail Circuit
ISP Ethernet Transport to
Provider Edge (PE)

NO ROUTING: Last Mile / Local Loop / Transport to ISP

Gateway .2

CE4

f4/0.192

"Wire"

f4/0.192

CE5

Gateway .2

A

Z

CLIENT ROUTING:
A side to Z side

4.0.0.0/24

.1

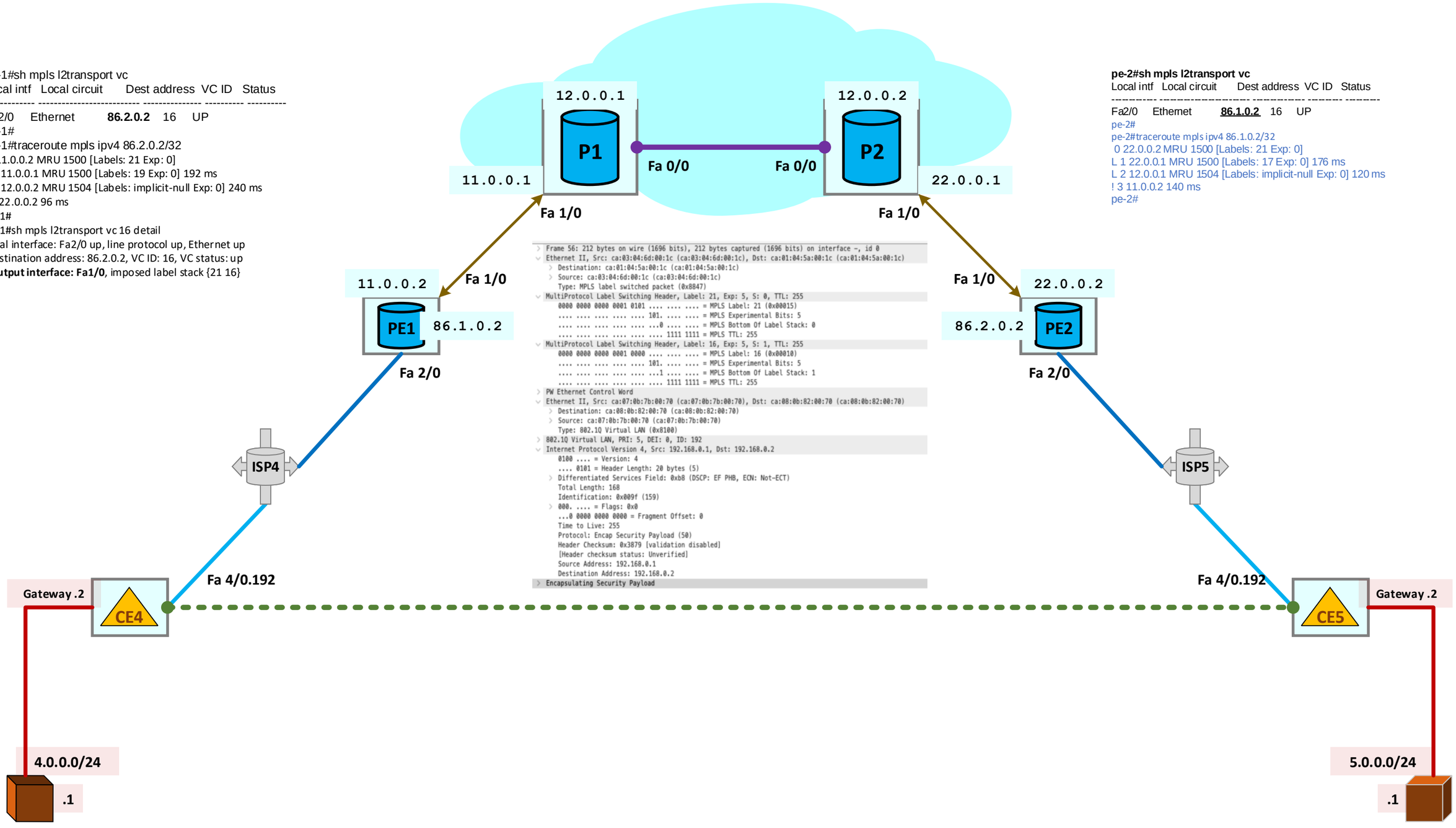
Network Connectivity

5.0.0.0/24

.1

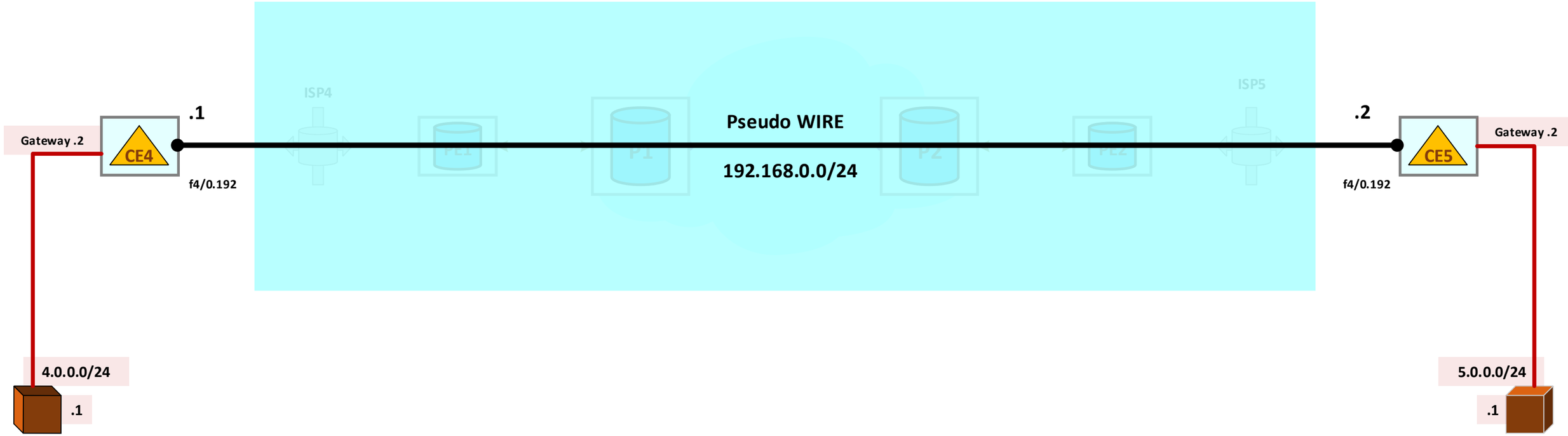
```
pe-1#sh mpls l2transport vc
Local intf   Local circuit        Dest address  VC ID   Status
------------ ------------------------- --------------- ---------- ----------
Fa2/0        Ethernet             86.2.0.2      16      UP
pe-1#
pe-1#traceroute mpls ipv4 86.2.0.2/32
 0 11.0.0.2 MRU 1500 [Labels: 21 Exp: 0]
L 1 11.0.0.1 MRU 1500 [Labels: 19 Exp: 0] 192 ms
L 2 12.0.0.2 MRU 1504 [Labels: implicit-null Exp: 0] 240 ms
! 3 22.0.0.2 96 ms
pe-1#
pe-1#sh mpls l2transport vc 16 detail
Local interface: Fa2/0 up, line protocol up, Ethernet up
 Destination address: 86.2.0.2, VC ID: 16, VC status: up
  Output interface: Fa1/0, imposed label stack {21 16}
```

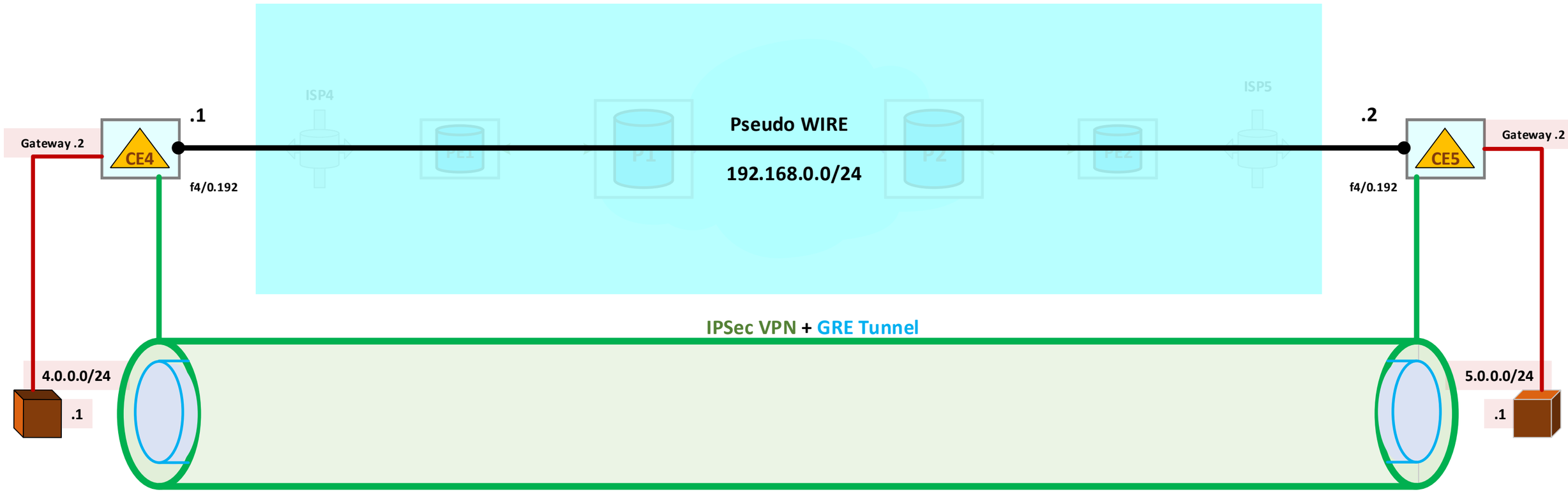
```
pe-2#sh mpls l2transport vc
Local intf   Local circuit        Dest address  VC ID   Status
------------ ------------------------- --------------- ---------- ----------
Fa2/0        Ethernet             86.1.0.2      16      UP
pe-2#
pe-2#traceroute mpls ipv4 86.1.0.2/32
 0 22.0.0.2 MRU 1500 [Labels: 21 Exp: 0]
L 1 22.0.0.1 MRU 1500 [Labels: 17 Exp: 0] 176 ms
L 2 12.0.0.1 MRU 1504 [Labels: implicit-null Exp: 0] 120 ms
! 3 11.0.0.2 140 ms
pe-2#
```




```
Frame 56: 212 bytes on wire (1696 bits), 212 bytes captured (1696 bits) on interface -, id 0
Ethernet II, Src: ca:03:04:6d:00:1c (ca:03:04:6d:00:1c), Dst: ca:01:04:5a:00:1c (ca:01:04:5a:00:1c)
    Destination: ca:01:04:5a:00:1c (ca:01:04:5a:00:1c)
    Source: ca:03:04:6d:00:1c (ca:03:04:6d:00:1c)
    Type: MPLS label switched packet (0x8847)
MultiProtocol Label Switching Header, Label: 21, Exp: 5, S: 0, TTL: 255
    0000 0000 0000 0001 0101 .... .... .... = MPLS Label: 21 (0x00015)
    .... .... .... .... .... 101. .... .... = MPLS Experimental Bits: 5
    .... .... .... .... .... ...0 .... .... = MPLS Bottom Of Label Stack: 0
    .... .... .... .... .... .... 1111 1111 = MPLS TTL: 255
MultiProtocol Label Switching Header, Label: 16, Exp: 5, S: 1, TTL: 255
    0000 0000 0000 0001 0000 .... .... .... = MPLS Label: 16 (0x00010)
    .... .... .... .... .... 101. .... .... = MPLS Experimental Bits: 5
    .... .... .... .... .... ...1 .... .... = MPLS Bottom Of Label Stack: 1
    .... .... .... .... .... .... 1111 1111 = MPLS TTL: 255
PW Ethernet Control Word
Ethernet II, Src: ca:07:0b:7b:00:70 (ca:07:0b:7b:00:70), Dst: ca:08:0b:82:00:70 (ca:08:0b:82:00:70)
    Destination: ca:08:0b:82:00:70 (ca:08:0b:82:00:70)
    Source: ca:07:0b:7b:00:70 (ca:07:0b:7b:00:70)
    Type: 802.1Q Virtual LAN (0x8100)
802.1Q Virtual LAN, PRI: 5, DEI: 0, ID: 192
Internet Protocol Version 4, Src: 192.168.0.1, Dst: 192.168.0.2
    0100 .... = Version: 4
    .... 0101 = Header Length: 20 bytes (5)
    Differentiated Services Field: 0xb8 (DSCP: EF PHB, ECN: Not-ECT)
    Total Length: 168
    Identification: 0x009f (159)
    000. .... = Flags: 0x0
    ...0 0000 0000 0000 = Fragment Offset: 0
    Time to Live: 255
    Protocol: Encap Security Payload (50)
    Header Checksum: 0x3879 [validation disabled]
    [Header checksum status: Unverified]
    Source Address: 192.168.0.1
    Destination Address: 192.168.0.2
Encapsulating Security Payload
```

```
CE-4#clear arp
CE-4#
*Nov 25 01:16:00.703: ARP: flushing ARP entries for all interfaces
*Nov 25 01:16:00.711: IP ARP: sent rep src 4.0.0.2 ca07.0b7b.0008,
         dst 4.0.0.2 ffff.ffff.ffff FastEthernet0/0
*Nov 25 01:16:00.715: IP ARP: sent rep src 192.168.0.1 ca07.0b7b.0070,
         dst 192.168.0.1 ffff.ffff.ffff FastEthernet4/0.192
*Nov 25 01:16:00.719: IP ARP: sent req src 192.168.0.1 ca07.0b7b.0070,
         dst 192.168.0.2 ca08.0b82.0070 FastEthernet4/0.192
*Nov 25 01:16:00.723: IP ARP: sent req src 4.0.0.2 ca07.0b7b.0008,
         dst 4.0.0.1 ca09.735d.0008 FastEthernet0/0
CE-4#
*Nov 25 01:16:00.787: IP ARP: rcvd rep src 4.0.0.1 ca09.735d.0008, dst 4.0.0.2 FastEthernet0/0
*Nov 25 01:16:00.851: IP ARP: rcvd rep src 192.168.0.2 ca08.0b82.0070, dst 192.168.0.1 FastEthernet4/0.192
CE-4#
```




ISP4
ISP5
.1
.2
Pseudo WIRE
192.168.0.0/24
Gateway .2
CE4
CE5
Gateway .2
f4/0.192
f4/0.192
IPSec VPN + GRE Tunnel
4.0.0.0/24
5.0.0.0/24
.1
.1