In [1]:
```
%load_ext uhed
```

In [2]:
```
%slice Syed
```

In [3]:
```
%site vts-gpo
```

In [4]:
```
%lab
```

Lab 9 - Troubleshooting

Build Network

Building:

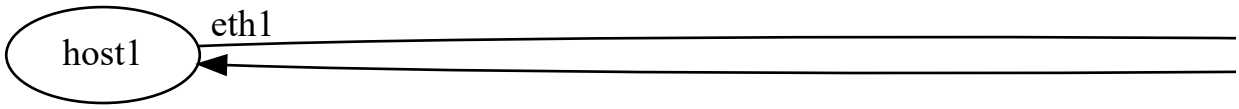
Success!

I created a slicename, selected the site that was not heavily in use by other people in class and manifested

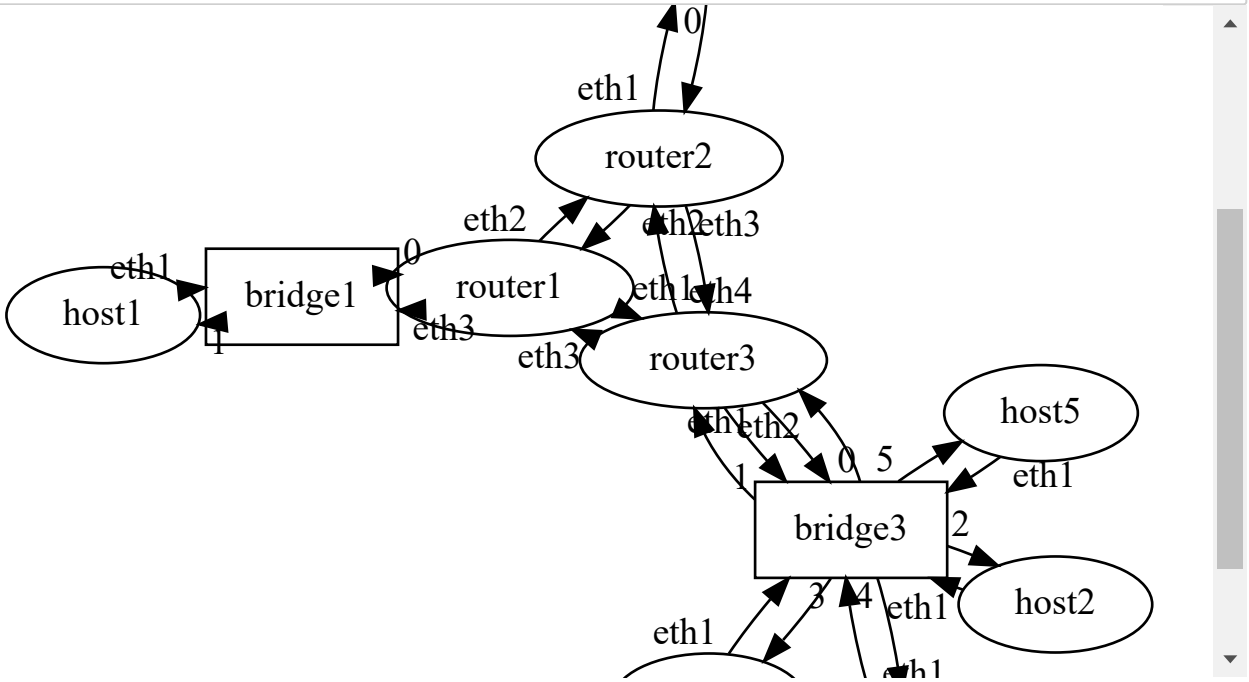
In [8]:
```
manifest = SITE.listresources(context, SLICE)
```

In [13]:
```
genish.showtopo(manifest)
```

Out[13]:



In [14]:
```
genish.showtopo(manifest,"neato")
```



In [17]:
```
SITE.getL2Table(context, SLICE, "bridge3")
```

Out[17]:

Port	VLAN	MAC	Age
1	1360	be:36:2c:f5:36:84	7
2	3810	0a:7d:60:9d:c4:60	7

In [18]:
```
SITE.getL2Table(context, SLICE, "bridge2")
```

Out[18]:

Port	VLAN	MAC	Age
1	0	b2:b0:89:c5:03:07	9

In [19]:
```
SITE.getL2Table(context, SLICE, "bridge1")
```

Out[19]:

Port	VLAN	MAC	Age

At this point essentially what I did was I created the L2 tables and assigned them to the bridges present in the network. This shows that everything is working fine (MAC address).

In [23]:
```
SITE.IPv4Router.getRouteTable(context, SLICE, "router1")
```

Out[23]:

	Selected	Network	Next Hop	Interface	Duration
O	True	10.20.127.0/24 [110/20]	10.75.88.2	eth2	00:19:18
O	True	10.30.155.0/24 [110/20]	10.77.7.2	eth1	00:19:18
O	True	10.40.81.0/24 [110/20]	10.77.7.2	eth1	00:19:18
O	False	10.75.88.0/30 [110/10]	directly connected	eth2	00:20:09
C	True	10.75.88.0/30	directly connected	eth2	None
O	True	10.76.100.0/30 [110/20]	10.75.88.2	eth2	00:19:18
	False		10.77.7.2	eth1	00:19:18
O	False	10.77.7.0/30 [110/10]	directly connected	eth1	00:19:28
C	True	10.77.7.0/30	directly connected	eth1	None
C	True	127.0.0.0/8	directly connected	lo	None

In [24]:
```
SITE.IPv4Router.getRouteTable(context, SLICE, "router2")
```

Out[24]:

	Selected	Network	Next Hop	Interface	Duration
O	False	10.20.127.0/24 [110/10]	directly connected	eth1	00:20:14
C	True	10.20.127.0/24	directly connected	eth1	None
O	True	10.30.155.0/24 [110/20]	10.76.100.2	eth3	00:19:29
O	True	10.40.81.0/24 [110/20]	10.76.100.2	eth3	00:19:29
O	False	10.75.88.0/30 [110/10]	directly connected	eth2	00:19:29
C	True	10.75.88.0/30	directly connected	eth2	None
O	False	10.76.100.0/30 [110/10]	directly connected	eth3	00:19:33
C	True	10.76.100.0/30	directly connected	eth3	None
O	True	10.77.7.0/30 [110/20]	10.75.88.1	eth2	00:19:23
	False		10.76.100.2	eth3	00:19:23
C	True	127.0.0.0/8	directly connected	lo	None

In [25]:
```
SITE.IPv4Router.getRouteTable(context, SLICE, "router3")
```

Out[25]:

	Selected	Network	Next Hop	Interface	Duration
O	True	10.20.127.0/24 [110/20]	10.76.100.1	eth4	00:19:36
O	False	10.30.155.0/24 [110/10]	directly connected	eth2	00:20:20
C	True	10.30.155.0/24	directly connected	eth2	None
O	False	10.40.81.0/24 [110/10]	directly connected	eth1	00:20:20
C	True	10.40.81.0/24	directly connected	eth1	None
O	True	10.75.88.0/30 [110/20]	10.76.100.1	eth4	00:19:36
	False		10.77.7.1	eth3	00:19:36
O	False	10.76.100.0/30 [110/10]	directly connected	eth4	00:20:20
C	True	10.76.100.0/30	directly connected	eth4	None
O	False	10.77.7.0/30 [110/10]	directly connected	eth3	00:20:20
C	True	10.77.7.0/30	directly connected	eth3	None
C	True	127.0.0.0/8	directly connected	lo	None

In [27]:
```
SITE.Host.getRouteTable(context, SLICE, "host1")
```

Out[27]:

Destination	Mask	Gateway	Interface
0.0.0.0	0.0.0.0	10.10.113.254	eth1
10.10.113.0	255.255.255.0	0.0.0.0	eth1

In [28]:
```
SITE.Host.getRouteTable(context, SLICE, "host2")
```

Out[28]:

Destination	Mask	Gateway	Interface
0.0.0.0	0.0.0.0	10.30.155.254	eth1
10.30.155.0	255.255.255.0	0.0.0.0	eth1

In [29]:
```
SITE.Host.getRouteTable(context, SLICE, "host3")
```

Out[29]:

Destination	Mask	Gateway	Interface
0.0.0.0	0.0.0.0	10.30.155.175	eth1
10.30.155.0	255.255.255.0	0.0.0.0	eth1

In [30]:
```
SITE.Host.getRouteTable(context, SLICE, "host4")
```

Out[30]:

Destination	Mask	Gateway	Interface
0.0.0.0	0.0.0.0	10.40.81.254	eth1
10.40.81.0	255.255.255.0	0.0.0.0	eth1

In [31]:
```
SITE.Host.getRouteTable(context, SLICE, "host5")
```

Out[31]:

Destination	Mask	Gateway	Interface
0.0.0.0	0.0.0.0	10.40.81.254	eth1
10.40.81.0	255.255.255.0	0.0.0.0	eth1

In [32]:
```
SITE.Host.getRouteTable(context, SLICE, "host6")
```

Out[32]:

Destination	Mask	Gateway	Interface
0.0.0.0	0.0.0.0	10.20.127.254	eth1
10.20.127.0	255.255.255.0	0.0.0.0	eth1

In [35]:
```
stpData = SITE.getSTPInfo(context, SLICE, ["bridge1", "bridge2", "bridge3"])
```

In [36]:
```
stpData["bridge1"]
```

Out[36]:

Bridge: bridge1

Bridge ID	Designated Root	Root Path Cost
8000.c6634eb4a345	8000.c6634eb4a345	0

Port	State	Role	Port ID	In State (secs)	RX	TX	Errors
bridge1:0 (1)	forwarding	designated	8002	1525	0	772	0
bridge1:1 (2)	forwarding	designated	8001	1529	0	774	0

In [37]:
```
stpData["bridge2"]
```

Out[37]:

Bridge: bridge2

Bridge ID	Designated Root	Root Path Cost
8000.aeea9ca61b46	8000.aeea9ca61b46	0

Port	State	Role	Port ID	In State (secs)	RX	TX	Errors
bridge2:0 (1)	forwarding	designated	8002	1520	0	769	0
bridge2:1 (2)	forwarding	designated	8001	1528	0	773	0

In [43]:
```
stpData["bridge3"]
```

Out[43]:

Bridge: bridge3

Bridge ID	Designated Root	Root Path Cost
8000.e6608e1bc849	8000.e6608e1bc849	0

Port	State	Role	Port ID	In State (secs)	RX	TX	Errors
bridge3:5 (6)	forwarding	designated	8004	1523	0	770	0
bridge3:2 (3)	forwarding	designated	8003	1524	0	771	0
bridge3:3 (4)	forwarding	designated	8002	1527	0	772	0
bridge3:4 (5)	forwarding	designated	8001	1527	0	773	0
bridge3:0 (2)	forwarding	designated	8005	1522	0	770	0
bridge3:1 (1)	forwarding	designated	8006	1521	0	769	0

In [46]:
```
SITE.getPortInfo(context, SLICE, "bridge1")
```

Out[46]:

Client ID	ifindex	vlan	MTU	Admin State	Link State	RX Bytes (Pkts)	TX Bytes (Pkts)
bridge1:0	8527	None	1500	up	down	834 (11)	1948 (33)
bridge1:1	8541	None	1500	up	up	648 (8)	2143442 (41215)

In [47]:
```
SITE.getPortInfo(context, SLICE, "bridge2")
```

Out[47]:

Client ID	ifindex	vlan	MTU	Admin State	Link State	RX Bytes (Pkts)	TX Bytes (Pkts)
bridge2:0	8529	None	1500	up	up	646080 (8284)	2143412 (41215)
bridge2:1	8551	None	1500	up	up	648 (8)	2788636 (49487)

In [48]:
```
SITE.getPortInfo(context, SLICE, "bridge3")
```

Out[48]:

Client ID	ifindex	vlan	MTU	Admin State	Link State	RX Bytes (Pkts)	TX Bytes (Pkts)
bridge3:5	8549	1360	1500	up	up	648 (8)	2788792 (49490)
bridge3:2	8543	3810	1500	up	up	648 (8)	2788896 (49492)
bridge3:3	8545	3810	1500	up	up	648 (8)	2788844 (49491)
bridge3:4	8547	2965	1500	up	up	648 (8)	2143412 (41215)
bridge3:0	8535	3810	1500	up	up	646080 (8284)	2143516 (41217)
bridge3:1	8533	1360	1500	up	up	646080 (8284)	2143568 (41218)

I recieved a Hello message from the following IP Address 10.30.155.254

tcpdump: verbose output suppressed, use -v or -vv for full protocol decode listening on eth1, link-type EN10MB (Ethernet), capture size 262144 bytes 00:27:39.258314 0a:7d:60:9d:c4:60 (oui Unknown) > 01:00:5e:00:00:05 (oui Unknown), ethertype IPv4 (0x0800), length 78: 10.30.155.254 >

224.0.0.5 : OSPFv2, Hello, length 44

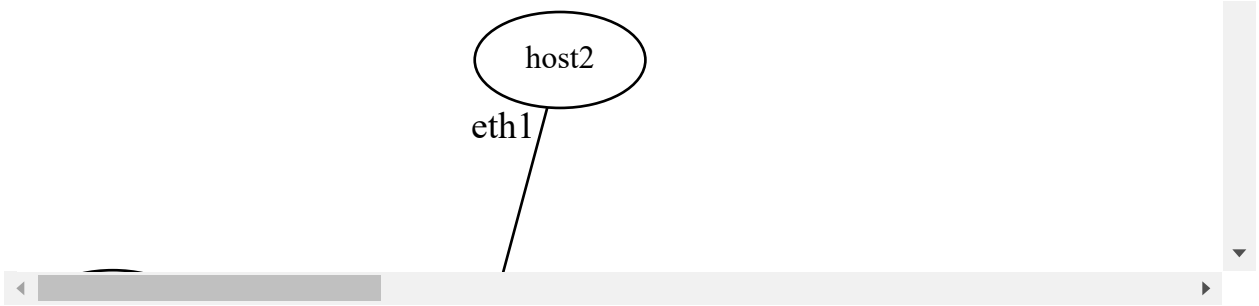
Error 2 - If you ping from host 1 to host 2 you get a host unreachable error.

In [50]:
```
import uhgeni.graph.util

g = uhgeni.graph.util.buildFromManifest(manifest)
g.context = context

g.show()
```

Out[50]:


host2
eth1

In [51]:
```
g["bridge3"][1].setDown()
g.decorateSTPInfo()
g.show()
```

Out[51]:

Error 1- # Host1 can not connect to any of the hosts because it is broken the "Link state" even says "down" indicating a broken connection

Client ID ifindex vlan MTU Admin State Link State RX Bytes (Pkts) TX Bytes (Pkts) bridge1:0 8527 None 1500 up down 834 (11) 1948 (33)

Error 2 - host 4 can't talk to any other hosts present in the topology simply because it is in a Vlan that doesn't have access other than the bridge its connected to and bridge 3 port 1 & 0 both belong to Vlan. Bridge 3's port 1 is (1360) and port 0 is (3810) therefore it is unable to communicate with any of the hosts.

sazaidi5@cot-cn:~$ gssh Syed host1

/ # / # ipaddr 1: lo: mtu 65536 qdisc noqueue state UNKNOWN qlen 1 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 8542: eth1@if8541: mtu 1500 qdisc netem state UP qlen 1000 link/ether e6:da:69:c5:fe:be brd ff:ff:ff:ff:ff:ff inet 10.10.113.192/24 scope global eth1 valid_lft forever preferred_lft forever inet6 fe80::e4da:69ff:fec5:febe/64 scope link valid_lft forever preferred_lft forever / # route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.10.113.254 0.0.0.0 UG 0 0 0 eth1 10.10.113.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1 / # / # / # arp -a / # ping 127.0.0.1 PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data. 64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.056 ms 64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.060 ms 64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.050 ms 64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.041 ms ^C --- 127.0.0.1 ping statistics --- 4 packets transmitted, 4 received, 0% packet loss, time 2999ms rtt min/avg/max/mdev = 0.041/0.051/0.060/0.011 ms / #

```
4 packets transmitted, 0 received, +4 errors, 100% packet loss, time 2999ms

/ #
/ #
/ # ping 10.20.127.17
PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data.
```

```
64 bytes from 10.20.127.17: icmp_seq=1 ttl=62 time=2.20 ms
64 bytes from 10.20.127.17: icmp_seq=2 ttl=62 time=0.134 ms
64 bytes from 10.20.127.17: icmp_seq=3 ttl=62 time=0.110 ms
64 bytes from 10.20.127.17: icmp_seq=4 ttl=62 time=0.106 ms
64 bytes from 10.20.127.17: icmp_seq=5 ttl=62 time=0.101 ms
64 bytes from 10.20.127.17: icmp_seq=6 ttl=62 time=0.237 ms
^C
--- 10.20.127.17 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 4997ms
rtt min/avg/max/mdev = 0.101/0.481/2.200/0.770 ms
/ #
/ #
/ # ipaddr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    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
8544: eth1@if8543: <BROADCAST,MULTICAST,UP,LOWER_UP,M-DOWN> mtu 1500 qdisc
netem state UP qlen 1000
    link/ether d2:86:7f:32:e0:2d brd ff:ff:ff:ff:ff:ff
    inet 10.30.155.113/24 scope global eth1
       valid_lft forever preferred_lft forever
    inet6 fe80::d086:7fff:fe32:e02d/64 scope link
       valid_lft forever preferred_lft forever
/ #
/ #
/ # ping 10.20.127.17
PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data.
64 bytes from 10.20.127.17: icmp_seq=1 ttl=62 time=1.01 ms
64 bytes from 10.20.127.17: icmp_seq=2 ttl=62 time=0.117 ms
64 bytes from 10.20.127.17: icmp_seq=3 ttl=62 time=0.115 ms
64 bytes from 10.20.127.17: icmp_seq=4 ttl=62 time=0.309 ms
^C
--- 10.20.127.17 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.115/0.389/1.017/0.371 ms
/ #
```

/ # / # ipaddr 1: lo: mtu 65536 qdisc noqueue state UNKNOWN qlen 1 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 8546: eth1@if8545: mtu 1500 qdisc netem state UP qlen 1000 link/ether 52:49:60:7c:81:ba brd ff:ff:ff:ff:ff:ff inet 10.30.155.187/24 scope global eth1 valid_lft forever preferred_lft forever inet6 fe80::5049:60ff:fe7c:81ba/64 scope link valid_lft forever preferred_lft forever / # / # / # route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.30.155.175 0.0.0.0 UG 0 0 0 eth1 10.30.155.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1 / # / # / # arp -a / # ping 10.10.113.192 PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data. From 10.30.155.187 icmp_seq=1 Destination Host Unreachable From 10.30.155.187 icmp_seq=2 Destination Host Unreachable From 10.30.155.187 icmp_seq=3 Destination Host Unreachable ^C --- 10.10.113.192 ping statistics --- 5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 4024ms pipe 3 / # / # / # ping 10.20.127.17 PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data. From 10.30.155.187 icmp_seq=1 Destination Host Unreachable From 10.30.155.187 icmp_seq=2 Destination Host

Unreachable From 10.30.155.187 icmp_seq=3 Destination Host Unreachable ^C --- 10.20.127.17 ping statistics --- 5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 3999ms pipe 4 / #

/ # ip addr 1: lo: mtu 65536 qdisc noqueue state UNKNOWN qlen 1 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 8548: eth1@if8547: mtu 1500 qdisc netem state UP qlen 1000 link/ether 16:e0:25:71:61:2c brd ff:ff:ff:ff:ff:ff inet 10.40.81.89/24 scope global eth1 valid_lft forever preferred_lft forever inet6 fe80::14e0:25ff:fe71:612c/64 scope link valid_lft forever preferred_lft forever / # / # route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.40.81.254 0.0.0.0 UG 0 0 0 eth1 10.40.81.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1 / # / # / # arp -a / # ping 10.10.113.192 PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data. From 10.40.81.89 icmp_seq=1 Destination Host Unreachable From 10.40.81.89 icmp_seq=2 Destination Host Unreachable From 10.40.81.89 icmp_seq=3 Destination Host Unreachable ^C --- 10.10.113.192 ping statistics --- 5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 4024ms pipe 3 / # / # / # ping 10.20.127.17 PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data. From 10.40.81.89 icmp_seq=1 Destination Host Unreachable From 10.40.81.89 icmp_seq=2 Destination Host Unreachable From 10.40.81.89 icmp_seq=3 Destination Host Unreachable ^C --- 10.20.127.17 ping statistics --- 6 packets transmitted, 0 received, +3 errors, 100% packet loss, time 5031ms

```
    inet6 fe80::8834:d5ff:fe9b:8200/64 scope link
       valid_lft forever preferred_lft forever
```

/ # / # / # route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.40.81.254 0.0.0.0 UG 0 0 0 eth1 10.40.81.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1 / # / # / # arp -a / # / # ping 10.10.113.192 PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data. From 10.40.81.254 icmp_seq=1 Destination Net Unreachable From 10.40.81.254 icmp_seq=2 Destination Net Unreachable ^C --- 10.10.113.192 ping statistics --- 2 packets transmitted, 0 received, +2 errors, 100% packet loss, time 1001ms

/ # / # / # ping 10.20.127.17 PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data. From 10.40.81.244 icmp_seq=1 Destination Host Unreachable From 10.40.81.244 icmp_seq=2 Destination Host Unreachable From 10.40.81.244 icmp_seq=3 Destination Host Unreachable ^C --- 10.20.127.17 ping statistics --- 6 packets transmitted, 0 received, +3 errors, 100% packet loss, time 5025ms pipe 3 / # / # / # / # ping 10.20.127.17 PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data. From 10.40.81.244 icmp_seq=1 Destination Host Unreachable From 10.40.81.244 icmp_seq=2 Destination Host Unreachable From 10.40.81.244 icmp_seq=3 Destination Host Unreachable ^C --- 10.20.127.17 ping statistics --- 5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 3999ms pipe 4

```
    inet6 fe80::8834:d5ff:fe9b:8200/64 scope link
       valid_lft forever preferred_lft forever
```

/ # / # / # route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.40.81.254 0.0.0.0 UG 0 0 0 eth1 10.40.81.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1 / # / # / # arp -a / # / # ping 10.10.113.192 PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data. From

10.40.81.254 icmp_seq=1 Destination Net Unreachable From 10.40.81.254 icmp_seq=2 Destination Net Unreachable ^C --- 10.10.113.192 ping statistics --- 2 packets transmitted, 0 received, +2 errors, 100% packet loss, time 1001ms

/ # / # / # ping 10.20.127.17 PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data. From 10.40.81.244 icmp_seq=1 Destination Host Unreachable From 10.40.81.244 icmp_seq=2 Destination Host Unreachable From 10.40.81.244 icmp_seq=3 Destination Host Unreachable ^C --- 10.20.127.17 ping statistics --- 6 packets transmitted, 0 received, +3 errors, 100% packet loss, time 5025ms pipe 3 / # / # / # / # ping 10.20.127.17 PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data. From 10.40.81.244 icmp_seq=1 Destination Host Unreachable From 10.40.81.244 icmp_seq=2 Destination Host Unreachable From 10.40.81.244 icmp_seq=3 Destination Host Unreachable ^C --- 10.20.127.17 ping statistics --- 5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 3999ms pipe 4

sazaidi5@cot-cn:~$ gssh Syed host6 / # ip addr 1: lo: mtu 65536 qdisc noqueue state UNKNOWN qlen 1 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 8552: eth1@if8551: mtu 1500 qdisc netem state UP qlen 1000 link/ether 96:86:c3:a1:89:4e brd ff:ff:ff:ff:ff:ff inet 10.20.127.17/24 scope global eth1 valid_lft forever preferred_lft forever inet6 fe80::9486:c3ff:fea1:894e/64 scope link valid_lft forever preferred_lft forever / # / # route-n /bin/sh: route-n: not found / # / # / # route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.20.127.254 0.0.0.0 UG 0 0 0 eth1 10.20.127.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1 / # / # / # arp -a / # ping 10.10.113.192 PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data. From 10.20.127.254 icmp_seq=1 Destination Net Unreachable From 10.20.127.254 icmp_seq=2 Destination Net Unreachable From 10.20.127.254 icmp_seq=3 Destination Net Unreachable ^C --- 10.10.113.192 ping statistics --- 3 packets transmitted, 0 received, +3 errors, 100% packet loss, time 2000ms

/ #

Error 3 is - essentially h3 & h2 inability to reach/communicate with host 5 & 4 is what the error is and thats caused due incompatibility between the different VLANs in this topology furthermore host 5 & 2 also have this same problem

Did a traceroute on h2 and copied and pasted the ip address from h6 in host2 and got the following result

traceroute -n 10.20.127.17

traceroute to 10.20.127.17 (10.20.127.17), 30 hops max, 46 byte packets 1 10.30.155.254 0.694 ms 0.004 ms 0.004 ms 2 10.76.100.1 0.004 ms 0.003 ms 0.003 ms 3 10.20.127.17 0.587 ms 0.005 ms 0.003 ms

```
# PING From H1

# ping 127.0.0.1
PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.056 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.060 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.050 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.041 ms
^C
--- 127.0.0.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.041/0.051/0.060/0.011 ms
/ #


PING From H2
64 bytes from 10.20.127.17: icmp_seq=3 ttl=62 time=0.115 ms
64 bytes from 10.20.127.17: icmp_seq=4 ttl=62 time=0.309 ms
^C
--- 10.20.127.17 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.115/0.389/1.017/0.371 ms
/ #
/ #
/ #
/ # ping 10.30.155.187
PING 10.30.155.187 (10.30.155.187) 56(84) bytes of data.
64 bytes from 10.30.155.187: icmp_seq=1 ttl=64 time=1.26 ms
64 bytes from 10.30.155.187: icmp_seq=2 ttl=64 time=0.068 ms
64 bytes from 10.30.155.187: icmp_seq=3 ttl=64 time=0.244 ms
64 bytes from 10.30.155.187: icmp_seq=4 ttl=64 time=0.248 ms
64 bytes from 10.30.155.187: icmp_seq=5 ttl=64 time=0.083 ms
64 bytes from 10.30.155.187: icmp_seq=6 ttl=64 time=0.067 ms
64 bytes from 10.30.155.187: icmp_seq=7 ttl=64 time=0.065 ms
64 bytes from 10.30.155.187: icmp_seq=8 ttl=64 time=0.065 ms
^C
--- 10.30.155.187 ping statistics ---
8 packets transmitted, 8 received, 0% packet loss, time 7000ms
rtt min/avg/max/mdev = 0.065/0.262/1.263/0.385 ms
/ # ipaddr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    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
8544: eth1@if8543: <BROADCAST,MULTICAST,UP,LOWER_UP,M-DOWN> mtu 1500 qdisc
netem state UP qlen 1000
    link/ether d2:86:7f:32:e0:2d brd ff:ff:ff:ff:ff:ff
    inet 10.30.155.113/24 scope global eth1
       valid_lft forever preferred_lft forever
    inet6 fe80::d086:7fff:fe32:e02d/64 scope link
       valid_lft forever preferred_lft forever
/ #
/ #
/ # traceroute -n 10.20.127.17
traceroute to 10.20.127.17 (10.20.127.17), 30 hops max, 46 byte packets
```

```
 1  10.30.155.254  0.694 ms  0.004 ms  0.004 ms
 2  10.76.100.1  0.004 ms  0.003 ms  0.003 ms
 3  10.20.127.17  0.587 ms  0.005 ms  0.003 ms
```

```
PING on H3
# ping 10.10.113.192
PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data.
From 10.30.155.187 icmp_seq=1 Destination Host Unreachable
From 10.30.155.187 icmp_seq=2 Destination Host Unreachable
From 10.30.155.187 icmp_seq=3 Destination Host Unreachable
^C
--- 10.10.113.192 ping statistics ---
5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 4024ms
pipe 3
/ #
/ #
/ # ping 10.20.127.17
PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data.
From 10.30.155.187 icmp_seq=1 Destination Host Unreachable
From 10.30.155.187 icmp_seq=2 Destination Host Unreachable
From 10.30.155.187 icmp_seq=3 Destination Host Unreachable
^C
--- 10.20.127.17 ping statistics ---
5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 3999ms
pipe 4
/ # ipaddr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    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
8546: eth1@if8545: <BROADCAST,MULTICAST,UP,LOWER_UP,M-DOWN> mtu 1500 qdisc
netem state UP qlen 1000
    link/ether 52:49:60:7c:81:ba brd ff:ff:ff:ff:ff:ff
    inet 10.30.155.187/24 scope global eth1
       valid_lft forever preferred_lft forever
    inet6 fe80::5049:60ff:fe7c:81ba/64 scope link
       valid_lft forever preferred_lft forever

PING ON H4


# ping 10.10.113.192
PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data.
From 10.40.81.89 icmp_seq=1 Destination Host Unreachable
From 10.40.81.89 icmp_seq=2 Destination Host Unreachable
From 10.40.81.89 icmp_seq=3 Destination Host Unreachable
^C
--- 10.10.113.192 ping statistics ---
5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 4024ms
pipe 3
/ #
/ #
```

```
/ # ping 10.20.127.17
PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data.
From 10.40.81.89 icmp_seq=1 Destination Host Unreachable
From 10.40.81.89 icmp_seq=2 Destination Host Unreachable
From 10.40.81.89 icmp_seq=3 Destination Host Unreachable
^C
--- 10.20.127.17 ping statistics ---
6 packets transmitted, 0 received, +3 errors, 100% packet loss, time 5031ms
pipe 3
/ #
/ #
/ # ping 10.30.155.113
PING 10.30.155.113 (10.30.155.113) 56(84) bytes of data.
From 10.40.81.89 icmp_seq=1 Destination Host Unreachable
From 10.40.81.89 icmp_seq=2 Destination Host Unreachable
From 10.40.81.89 icmp_seq=3 Destination Host Unreachable
From 10.40.81.89 icmp_seq=4 Destination Host Unreachable
From 10.40.81.89 icmp_seq=5 Destination Host Unreachable
From 10.40.81.89 icmp_seq=6 Destination Host Unreachable
^C
--- 10.30.155.113 ping statistics ---
7 packets transmitted, 0 received, +6 errors, 100% packet loss, time 6031ms
pipe 3
/ #
```

```
PING ON H5

/ # ping 10.20.127.17
PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data.
From 10.40.81.244 icmp_seq=1 Destination Host Unreachable
From 10.40.81.244 icmp_seq=2 Destination Host Unreachable
From 10.40.81.244 icmp_seq=3 Destination Host Unreachable
^C
--- 10.20.127.17 ping statistics ---
6 packets transmitted, 0 received, +3 errors, 100% packet loss, time 5025ms
pipe 3
/ #
/ #
/ #
/ # ping 10.20.127.17
PING 10.20.127.17 (10.20.127.17) 56(84) bytes of data.
From 10.40.81.244 icmp_seq=1 Destination Host Unreachable
From 10.40.81.244 icmp_seq=2 Destination Host Unreachable
From 10.40.81.244 icmp_seq=3 Destination Host Unreachable
^C
--- 10.20.127.17 ping statistics ---
5 packets transmitted, 0 received, +3 errors, 100% packet loss, time 3999ms
pipe 4
/ #

PING ON H6

/ # arp -a
/ # ping 10.10.113.192
PING 10.10.113.192 (10.10.113.192) 56(84) bytes of data.
From 10.20.127.254 icmp_seq=1 Destination Net Unreachable
```

```
From 10.20.127.254 icmp_seq=2 Destination Net Unreachable
From 10.20.127.254 icmp_seq=3 Destination Net Unreachable
^C
--- 10.10.113.192 ping statistics ---
3 packets transmitted, 0 received, +3 errors, 100% packet loss, time 2000ms

/ #
```

```
hop 3 is the destination, hop 2 is the bridge

traceroute to 10.20.127.17 (10.20.127.17), 30 hops max, 46 byte packets
 1  10.30.155.254  0.694 ms  0.004 ms  0.004 ms
 2  10.76.100.1  0.004 ms  0.003 ms  0.003 ms
 3  10.20.127.17  0.587 ms  0.005 ms  0.003 ms
/ #
```

```
Traceroute on h2 from h5 ip address

/ # traceroute -n 10.40.81.244
traceroute to 10.40.81.244 (10.40.81.244), 30 hops max, 46 byte packets
 1  10.30.155.254  0.619 ms  0.004 ms  0.004 ms
 2  10.30.155.254  2998.170 ms !H  2999.934 ms !H  2999.975 ms !H
```

Last error - Theres a delay in the round trip time or the ping games from H2 to H5 compared to other hosts H2 to H6 and we can fix that or decrease the time for the round trip by rearranging the topology and the VLANS

In [53]:
```
SITE.IPv4Router.getOSPFNeighbors(context, SLICE, "router1")
```

Out[53]:

ID	Priority	State	Dead Time	Address	Interface
10.76.100.1	1	Full/Backup	36.972s	10.75.88.2	eth2:10.75.88.1
10.77.7.2	1	Full/DR	39.530s	10.77.7.2	eth1:10.77.7.1

In [54]:
```
SITE.IPv4Router.getOSPFNeighbors(context, SLICE, "router2")
```

Out[54]:

ID	Priority	State	Dead Time	Address	Interface
10.77.7.1	1	Full/DR	31.701s	10.75.88.1	eth2:10.75.88.2
10.77.7.2	1	Full/DR	34.258s	10.76.100.2	eth3:10.76.100.1

In [55]:
```
SITE.IPv4Router.getOSPFNeighbors(context, SLICE, "router3")
```

Out[55]:

ID	Priority	State	Dead Time	Address	Interface
10.76.100.1	1	Full/Backup	34.859s	10.76.100.1	eth4:10.76.100.2
10.77.7.1	1	Full/Backup	34.859s	10.77.7.1	eth3:10.77.7.2

Solution 1 - For host 1 to be able to communicate with all the hosts we must change the link state to "up"

Solution to Error 2 is - Either there must be a port assigned to bridge 3 that goes from the router to the bridge 3 and/or port 1 & 0 must be inclusive to all Vlans specially host 4.

Solution to the Error 3 - Modify the configuration of H4 to bridge all VLANs

```
Solution for Error 4 - Rearrange the topology and Vlans
```

In [ ]:
```

```