

COMPUTER NETWORKS LABORATORY

By:
Nitish S
PES2201800368
5 'A'

WEEK – 8 - Understand the building blocks and usage of ClayNet Network Virtualization platform with reference to OSI Layer.

Date: 16/11/2020

Objectives of the Lab:

- Understand the building blocks of ClayNet.
- Build a simple client-server network using routers, switches, and network hosts.
- To learn the static IP routing behavior such as default and static routes and routing tables.
- Use common network utilities to verify LAN operation and analyze data traffic.

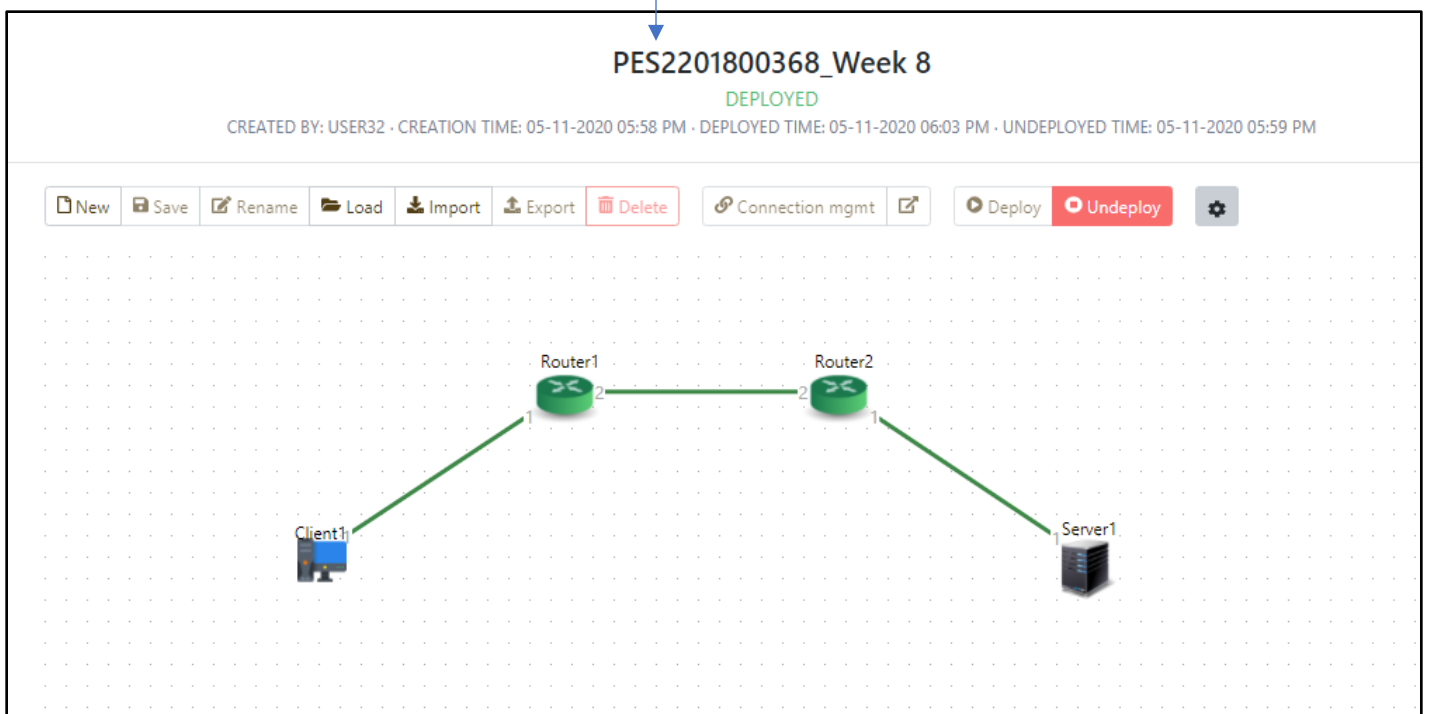
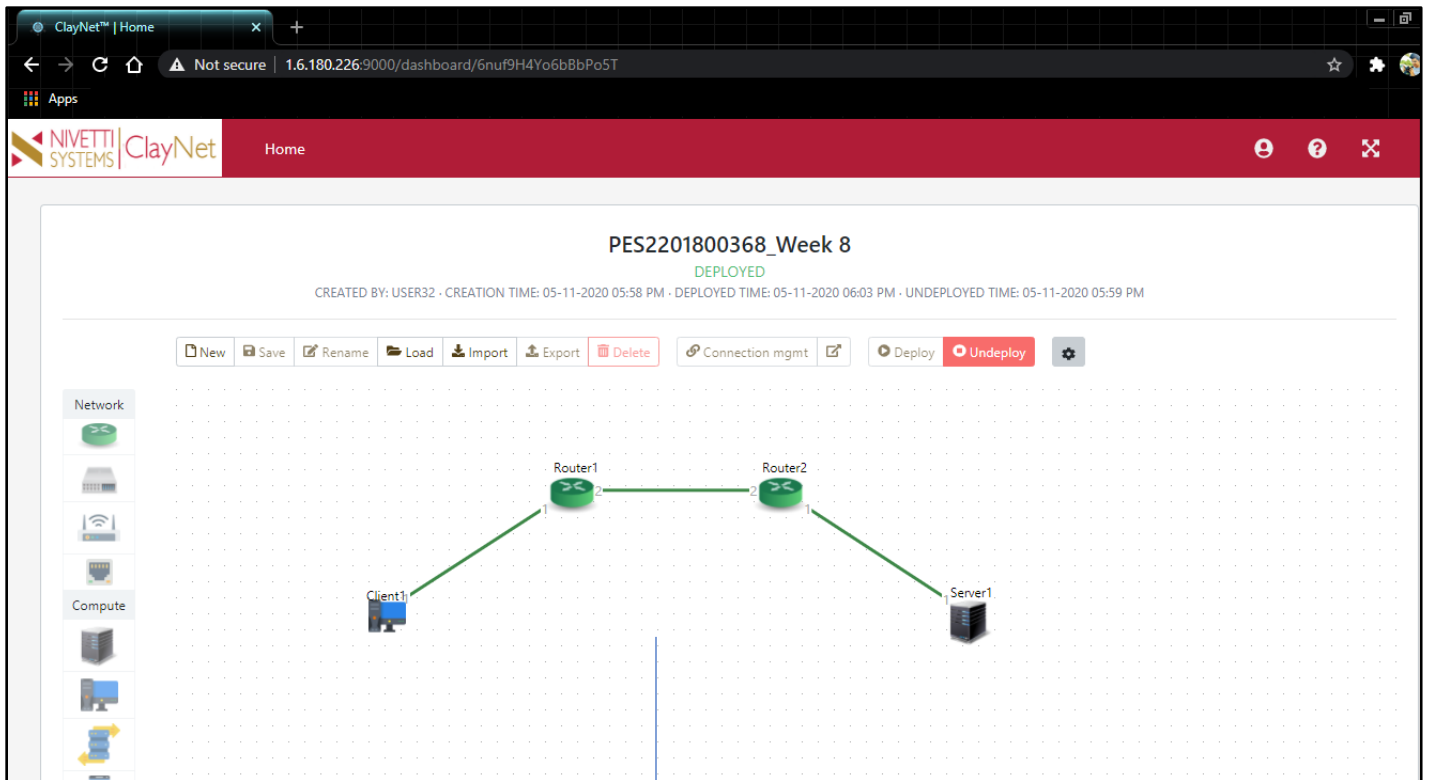
Prerequisites:

This lab assumes some understanding of the building blocks of communication networks and basic client-server architecture.

To access ClayNet, type **http://1.6.180.226:9000/** in browser.

Topology 1:

Create a topology in ClayNet, as shown in following figure.



All the configurations and connections to the topology are made by following the instructions given. The routing table entries are manually provided using commands in the router console.

Client1

IP Address ---> 10.10.10.2

Gateway ---> 10.10.10.1

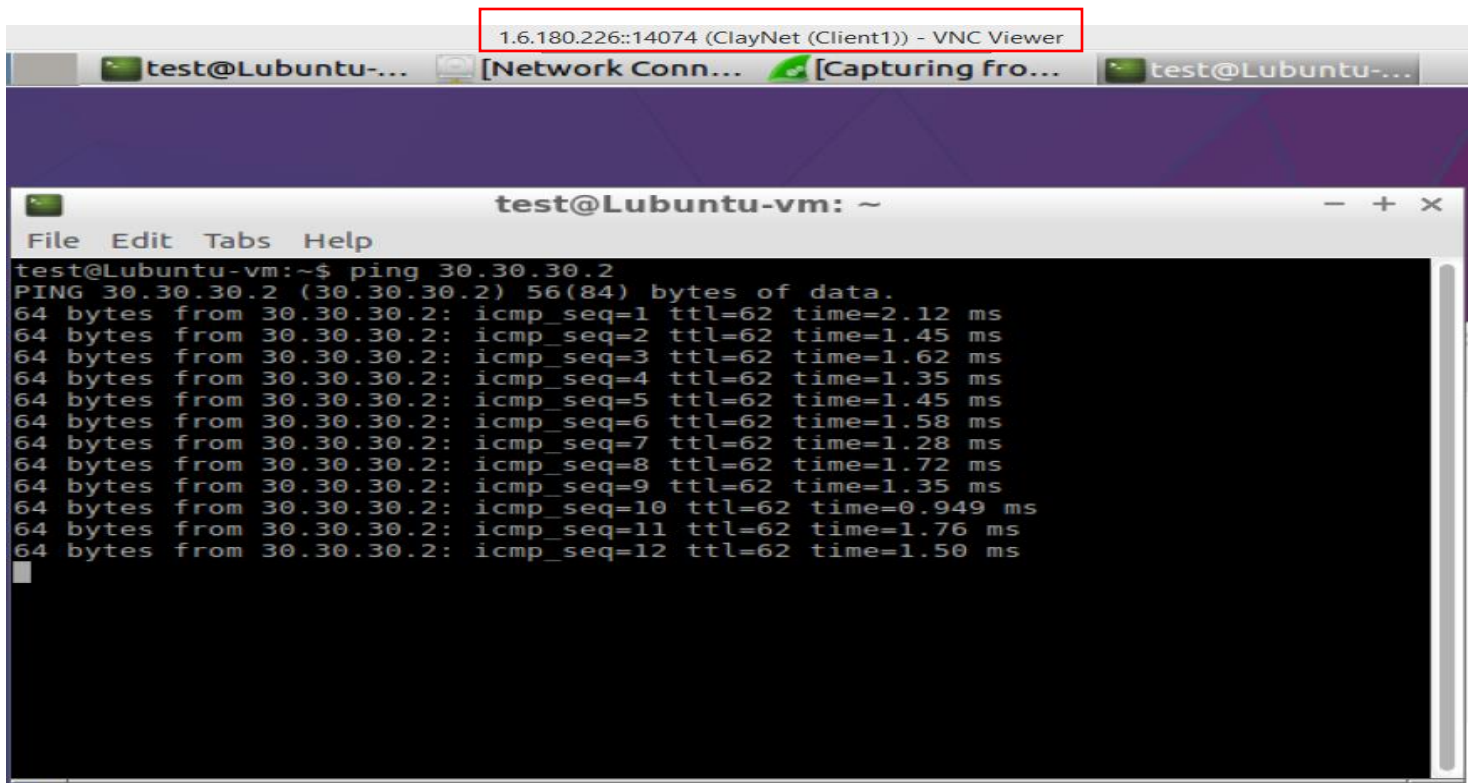
Server1:

IP Address ---> 30.30.30.2

Gateway ---> 30.30.30.1

ROUTERS	DESTINATION	NEXT HOP GATEWAY	VIA
Router1	30.30.30.0	20.20.20.2	Direct
Router2	10.10.10.0	20.20.20.1	Direct

From the remote Desktop in Client1, we ping the server1 using the IP address. If all the connections and routing table entries are correct, we can capture packets transferred to and received from server1.



```
1.6.180.226::14074 (ClayNet (Client1)) - VNC Viewer
test@Lubuntu-vm:~$ ping 30.30.30.2
PING 30.30.30.2 (30.30.30.2) 56(84) bytes of data.
64 bytes from 30.30.30.2: icmp_seq=1 ttl=62 time=2.12 ms
64 bytes from 30.30.30.2: icmp_seq=2 ttl=62 time=1.45 ms
64 bytes from 30.30.30.2: icmp_seq=3 ttl=62 time=1.62 ms
64 bytes from 30.30.30.2: icmp_seq=4 ttl=62 time=1.35 ms
64 bytes from 30.30.30.2: icmp_seq=5 ttl=62 time=1.45 ms
64 bytes from 30.30.30.2: icmp_seq=6 ttl=62 time=1.58 ms
64 bytes from 30.30.30.2: icmp_seq=7 ttl=62 time=1.28 ms
64 bytes from 30.30.30.2: icmp_seq=8 ttl=62 time=1.72 ms
64 bytes from 30.30.30.2: icmp_seq=9 ttl=62 time=1.35 ms
64 bytes from 30.30.30.2: icmp_seq=10 ttl=62 time=0.949 ms
64 bytes from 30.30.30.2: icmp_seq=11 ttl=62 time=1.76 ms
64 bytes from 30.30.30.2: icmp_seq=12 ttl=62 time=1.50 ms
```

1.6.180.226:14074 (ClayNet (Client1)) - VNC Viewer

test@Lubuntu-... [Network Conn... *eth0 test@Lubuntu-... 18:41

test@Lubuntu-vm: ~

File Edit Tabs Help

```
64 bytes from 30.30.30.2: icmp_seq=40 ttl=62 time=1.61 ms
64 bytes from 30.30.30.2: icmp_seq=41 ttl=62 time=1.22 ms
64 bytes from 30.30.30.2: icmp_seq=42 ttl=62 time=1.06 ms
64 bytes from 30.30.30.2: icmp_seq=43 ttl=62 time=1.73 ms
64 bytes from 30.30.30.2: icmp_seq=44 ttl=62 time=1.89 ms
64 bytes from 30.30.30.2: icmp_seq=45 ttl=62 time=1.58 ms
64 bytes from 30.30.30.2: icmp_seq=46 ttl=62 time=1.01 ms
64 bytes from 30.30.30.2: icmp_seq=47 ttl=62 time=1.49 ms
64 bytes from 30.30.30.2: icmp_seq=48 ttl=62 time=1.75 ms
64 bytes from 30.30.30.2: icmp_seq=49 ttl=62 time=1.52 ms
64 bytes from 30.30.30.2: icmp_seq=50 ttl=62 time=1.40 ms
64 bytes from 30.30.30.2: icmp_seq=51 ttl=62 time=1.74 ms
64 bytes from 30.30.30.2: icmp_seq=52 ttl=62 time=1.36 ms
64 bytes from 30.30.30.2: icmp_seq=53 ttl=62 time=1.74 ms
64 bytes from 30.30.30.2: icmp_seq=54 ttl=62 time=1.47 ms
64 bytes from 30.30.30.2: icmp_seq=55 ttl=62 time=1.27 ms
64 bytes from 30.30.30.2: icmp_seq=56 ttl=62 time=8.95 ms
64 bytes from 30.30.30.2: icmp_seq=57 ttl=62 time=1.68 ms
64 bytes from 30.30.30.2: icmp_seq=58 ttl=62 time=1.39 ms
^C
--- 30.30.30.2 ping statistics ---
58 packets transmitted, 58 received, 0% packet loss, time 57124ms
rtt min/avg/max/mdev = 0.949/2.267/31.376/4.002 ms
test@Lubuntu-vm:~$
```

WIRESHARK CAPTURE:-

1.6.180.226:14074 (ClayNet (Client1)) - VNC Viewer

test@Lubuntu-... [Network Conn... *eth0 test@Lubuntu-... 18:41

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/> Expression...

No.	Time	Source	Destination	Protocol	Length	Info
5	20.158170855	30.30.30.2	10.10.10.2	ICMP	98	Echo (ping) reply id=0x0723, seq=1/256, ttl=62 (request id=0x0723, seq=2/512, ttl=64 (reply id=0x0723, seq=2/512, ttl=62 (request id=0x0723, seq=3/768, ttl=64 (reply id=0x0723, seq=3/768, ttl=62 (request id=0x0723, seq=4/1024, ttl=64 (reply id=0x0723, seq=4/1024, ttl=62 (request id=0x0723, seq=5/1280, ttl=64 (reply id=0x0723, seq=5/1280, ttl=62 (request id=0x0723, seq=6/1536, ttl=64 (reply id=0x0723, seq=6/1536, ttl=62 (request id=0x0723, seq=7/1792, ttl=64 (reply id=0x0723, seq=7/1792, ttl=62 (request
6	21.157376860	10.10.10.2	30.30.30.2	ICMP	98	Echo (ping) request
7	21.158801670	30.30.30.2	10.10.10.2	ICMP	98	Echo (ping) reply
8	22.159024882	10.10.10.2	30.30.30.2	ICMP	98	Echo (ping) request
9	22.160622776	30.30.30.2	10.10.10.2	ICMP	98	Echo (ping) reply
10	23.160882980	10.10.10.2	30.30.30.2	ICMP	98	Echo (ping) request
11	23.162220805	30.30.30.2	10.10.10.2	ICMP	98	Echo (ping) reply
12	24.162374064	10.10.10.2	30.30.30.2	ICMP	98	Echo (ping) request
13	24.163815445	30.30.30.2	10.10.10.2	ICMP	98	Echo (ping) reply
14	25.164015991	10.10.10.2	30.30.30.2	ICMP	98	Echo (ping) request
15	25.165569278	30.30.30.2	10.10.10.2	ICMP	98	Echo (ping) reply
16	26.165875129	10.10.10.2	30.30.30.2	ICMP	98	Echo (ping) request

Frame 1: 78 bytes on wire (624 bits), 78 bytes captured (624 bits) on interface 0
Ethernet II, Src: 2a:26:00:00:00:6d (2a:26:00:00:00:6d), Dst: IPv4mcast_05 (01:00:5e:00:00:05)
Internet Protocol Version 4, Src: 10.10.10.1, Dst: 224.0.0.5
Open Shortest Path First