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Week number: 9

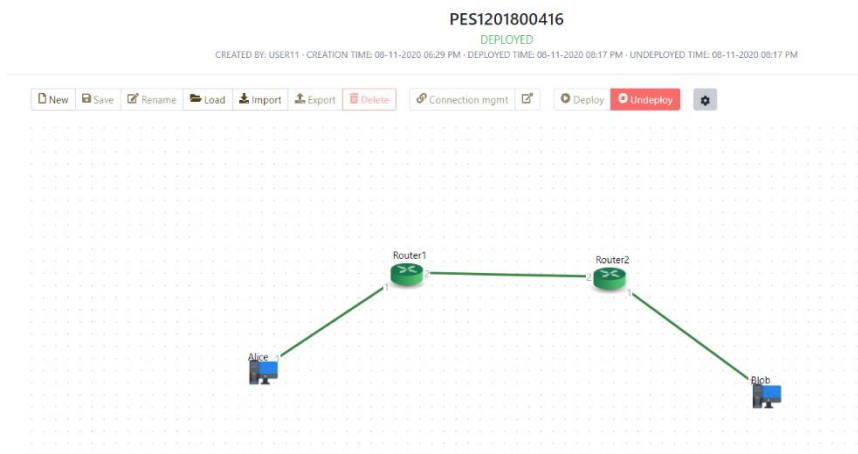
Name of experiment: IPv6 Configuration and Static Routing

Date: 8-11-2020

Objectives of the experiment:

- Perform basic IPv6 configurations on a Desktop and Router.
- Distinguish between IPv4 and IPv6 addresses
- Configure IPv6 static routes in Router
- Observe traffic flow using IPv6 static routes.
- IPv6 neighbor cache entries
- Understanding IPv6 Link Local Address
- Working with ping6 and tracepath6

Topology:



Verify traffic flow between Alice and Bob:

- * From Alice workstation ping Bob, observe the packet from and TTL in ping reply
- * From Alice workstation run tracepath to Bob's IP. Observer the intermediate hops

Wireshark capture-

1.6.181.7::7114 (ClayNet (Alice)) - VNC Viewer

test@Lubuntu-... *eth0 test@Lubuntu-...

*eth0

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

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

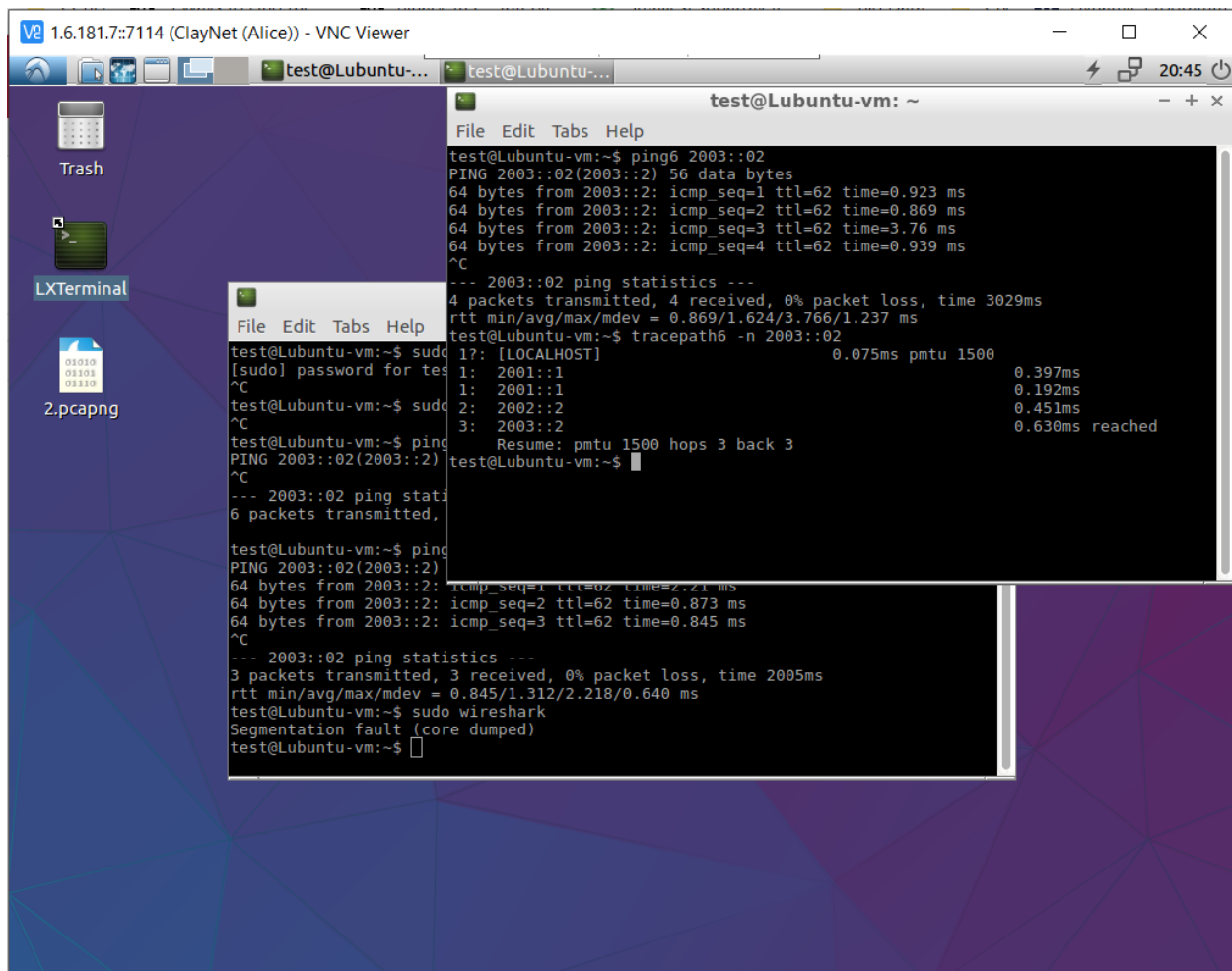
No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	2001::2	2003::2	ICMPv6	118	Echo (ping) request id=0x0618, seq=1, hop limit=64 (reply in ...
2	0.000882778	2003::2	2001::2	ICMPv6	118	Echo (ping) reply id=0x0618, seq=1, hop limit=62 (request in ...
3	1.004198580	2001::2	2003::2	ICMPv6	118	Echo (ping) request id=0x0618, seq=2, hop limit=64 (reply in ...
4	1.005028329	2003::2	2001::2	ICMPv6	118	Echo (ping) reply id=0x0618, seq=2, hop limit=62 (request in ...
5	2.028253635	2001::2	2003::2	ICMPv6	118	Echo (ping) request id=0x0618, seq=3, hop limit=64 (reply in ...
6	2.031970838	2003::2	2001::2	ICMPv6	118	Echo (ping) reply id=0x0618, seq=3, hop limit=62 (request in ...
7	3.029286718	2001::2	2003::2	ICMPv6	118	Echo (ping) request id=0x0618, seq=4, hop limit=64 (reply in ...
8	3.030183336	2003::2	2001::2	ICMPv6	118	Echo (ping) reply id=0x0618, seq=4, hop limit=62 (request in ...

Frame 1: 118 bytes on wire (944 bits), 118 bytes captured (944 bits) on interface 0
 Ethernet II, Src: a2:26:00:00:15:1c (a2:26:00:00:15:1c), Dst: a2:26:00:00:00:37 (a2:26:00:00:00:37)
 Internet Protocol Version 6, Src: 2001::2, Dst: 2003::2
 Internet Control Message Protocol v6

0000 a2 26 00 00 00 37 a2 26 00 00 15 1c 86 dd 60 0b .S..7..
 0010 9a 3a 00 40 3a 40 20 01 00 00 00 00 00 00 00 .: @:
 0020 00 00 00 00 00 02 20 03 00 00 00 00 00 00 00
 0030 00 00 00 00 00 02 80 00 cc 33 06 18 00 01 18 0b3.....
 0040 a8 5f 00 00 00 00 e7 f2 06 00 00 00 00 00 10 11
 0050 12 13 14 15 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21!

wireshark_eth0_20201108204319_PRgwba.pcapng Packets: 8 · Displayed: 8 (100.0%) Profile: Default

Ping and traceroute-



Check the connectivity between Router-1 and Router-2 using Link Local Address:

Login to Router-2 and get the link-local address of interface connected to Router

Now, Login to Router-1 and ping the link-local address on Router-2 and observe the response. When pinging link-local address, the the name if out-going interface should be specified in the command. If no interface or wrong interface name is specified, ping will result in error or unsuccessful.

```
Home | Edmodo x ClayNet™ | Home x clayroot@ClayNet: - x clayroot@ClayNet: - +
1.6.181.7:8000/wetty/ssh/clayroot/127.0.0.1/52726
Apps The C++ Standard... OG Course | Fork CPP CCBD M 5 Ways to Find the... M Binary Tree - interv... Smallest subarray fr... Big Data CN Dynamic Programm... palindromic strings practice

IP information
-----
Router : data

IPv6 information
-----
Address : 2002::1
Netmask : ffff:ffff:ffff:ffff::
Link local Address : fe80::a026:ff:fe00:38
Link local Netmask : ffff:ffff:ffff:ffff::
Scope Zone : 33488909
Preference : 1
Metric : 1

TE information
-----
Maximum Bandwidth : 10000 kbps
Maximum Reservable Bandwidth : 10000 kbps
Update threshold percentage : 10

operational> ping data:fe80::a026:ff:fe00:38%if-port-2
PING ::1 -> fe80::a026:ff:fe00:38%33488909
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=0 hoplimit=64 time=0.061 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=1 hoplimit=64 time=0.047 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=2 hoplimit=64 time=0.037 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=3 hoplimit=64 time=0.037 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=4 hoplimit=64 time=0.033 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=5 hoplimit=64 time=0.040 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=6 hoplimit=64 time=0.034 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=7 hoplimit=64 time=0.033 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=8 hoplimit=64 time=0.031 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=9 hoplimit=64 time=0.049 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=10 hoplimit=64 time=0.054 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=11 hoplimit=64 time=0.048 ms
16 bytes from fe80::a026:ff:fe00:38: icmp_seq=12 hoplimit=64 time=0.062 ms
^C
---- PING Statistics----
13 packets transmitted, 13 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 0.000/0.044/0.062/0.010 ms
operational>
```