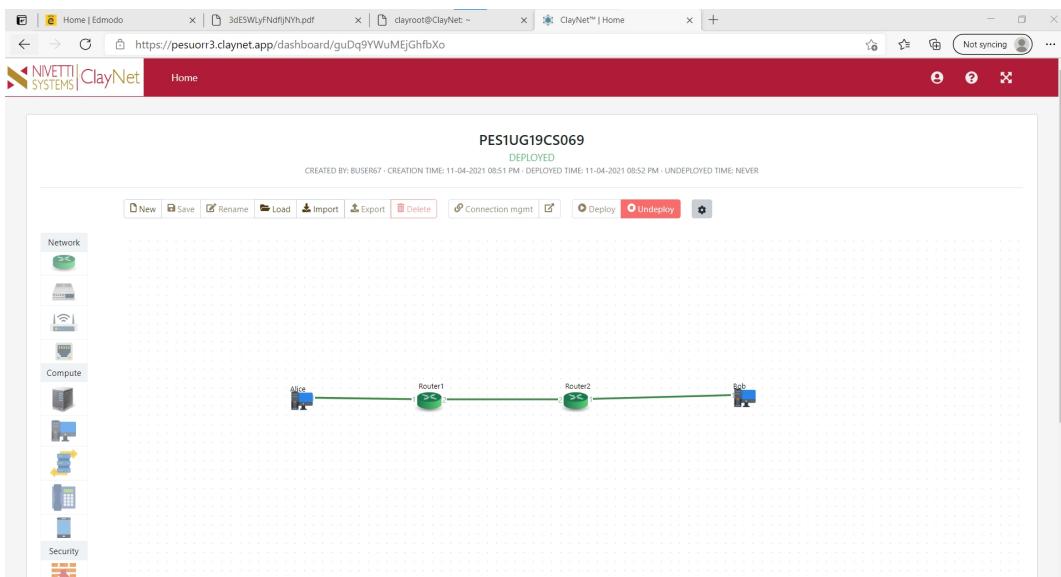


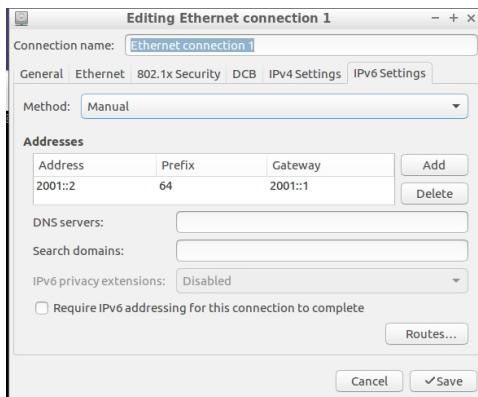
ANKITH J RAI  
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“B” Section

## **IPv6 Configuration and Static Routing**

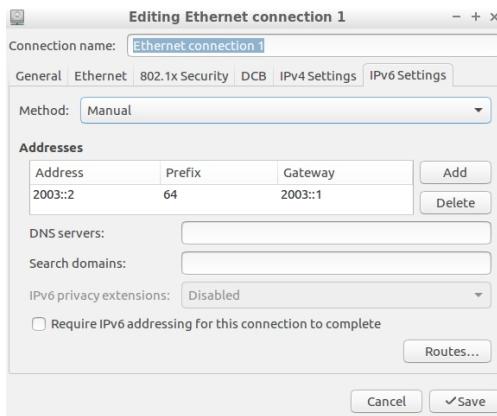
The following topology is created and deployed on ClayNet.



The configuration of Alice:



The configuration of Bob:



## Configuration of Routers

### Router 1

```

operational> show router details data
> Router : data
General information
-----
Router ID      : 16387
State          : up
Interfaces     : 9
Routing gateways : 4
Local addresses : 2
Sockets         : 2
Flags           : -----
Last state transition : 21:03:08, Sunday, April 11, 2021 IST

IPv4 information
-----
Default source address : 0.0.0.0
Default TTI            : 64
Interfaces             : 9

IPv4 routes
-----
Active routes       :      3
Backup routes       :      0
Total routes        :      3

IPv4 routes by source
-----
Directly connected routes :      2
Static routes           :      0
RIP routes              :      0
OSPFv2 routes          :      1
BGP routes              :      0

IPv4 listeners and connections
-----
TCP listeners        :      1
TCP connections      :      0
TCP sockets          :      1
UDP sockets          :      0

```

```

OSPFv2 information
-----
Router ID      : 1.1.1.1
Number of areas : 1
Preference      : 50
SPF hold count : 0

IPv6 information
-----
Default Hop Limit : 64
Interfaces       : 1

IPv6 routes
-----
Active routes    : 1
Backup routes   : 0
Total routes     : 1

IPv6 routes by source
-----
Directly connected routes : 1
Static routes            : 0
BGP routes               : 0

IPv6 listeners and connections
-----
TCP listeners       : 1
TCP connections    : 0
TCP sockets        : 1
UDP sockets        : 0

SSH server
-----
Enabled           : Yes
TCP keep alives   : enabled
Allowed versions  : ssh-version-2

Telnet server
-----
Enabled           : No

SNMP
-----
SNMP
-----
Enabled           : No

XMP server
-----
Enabled           : No

Quality of Service
-----
Default class for forwarded traffic : class-1
Default drop-profile for forwarded traffic : green
Default class for local traffic      : class-1
Default drop-profile for local traffic : green

operational> []

```

## Verifying interface configuration

Interface name	Status	Encaps- ulation	IP address
if-port-1	up	ethernet	2001::1/64 fe80::a026:ff:fe00:6d/64
if-port-2	up	ethernet	2002::1/64 fe80::a026:ff:fe00:6e/64
if-port-3	down	ethernet	-
if-port-4	down	ethernet	-
if-port-5	down	ethernet	-
if-port-6	down	ethernet	-
if-port-7	down	ethernet	-
if-port-8	down	ethernet	-
management	disabled	ethernet	10.0.0.12/24

Total number of interfaces displayed : 9

operational> []

## Routing Table Entry after configuration

```

> IPv6 active routes
>> Destination : ::1/128
  Gateway(s) : { `^loopback-16387
                 ::1` }
  Source     : direct
  Flags      : -
>> Destination : 2001::/64
  Gateway(s) : { `if-port-1
                 ::` }
  Source     : direct
  Flags      : -
>> Destination : 2002::/64
  Gateway(s) : { `if-port-2
                 ::` }
  Source     : direct
  Flags      : -
>> Destination : 2003::/64
  Gateway(s) : { `if-port-2
                 2002::2` }
  Source     : static
  Flags      : -
>> Destination : fe80::/64
  Gateway(s) : { `if-port-1
                 ::` }
  Source     : direct
  Flags      : -
>> Destination : fe80::/64
  Gateway(s) : { `if-port-2
                 ::` }
  Source     : direct
  Flags      : -
Total number of IPv6 active routes displayed : 6
No IPv6 backup routes are available

```

## Router 2

```

operational> show router details data
> Router : data
General information
-----
Router ID      : 16387
State          : up
Interfaces     : 9
Routing gateways : 4
Total interfaces : 9
Sockets        : 2
Flags          : -----
Last state transition : 21:29:47, Sunday, April 11, 2021 IST

IPv4 information
-----
Default source address : 0.0.0.0
Default TTL           : 64
Interfaces            : 9

IPv4 routes
-----
Active routes       : 3
Backup routes      : 0
Total routes        : 3

IPv4 routes by source
-----
Directly connected routes : 2
Static routes          : 0
RIP routes             : 0
OSPFv2 routes         : 1
BGP routes             : 0

IPv4 listeners and connections
-----
TCP listeners       : 1
TCP connections     : 0
TCP sockets         : 1
UDP sockets         : 0

```

```

F | Home | Edmodo      X | 3dESWLyFnfdjNYh.pdf | clayroot@ClayNet: ~ | clayroot@ClayNet: ~ | ClayNet™ | Home | + | - | □ | ×
← → ⌂ https://pesuoirr3.wetty.app/wetty/ssh/clayroot/127.0.0.1/53853
Not syncing ...
OSPFv2 information
-----
Router ID : 1.1.1.1
Number of areas : 1
Preference : 50
SPF hold count : 0

IPv6 information
-----
Default Hop Limit : 64
Interfaces : 1

IPv6 routes
-----
Active routes : 1
Backup routes : 0
Total routes : 1

IPv6 routes by source
-----
Directly connected routes : 1
Static routes : 0
BGP routes : 0

IPv6 listeners and connections
-----
TCP listeners : 1
TCP connections : 0
TCP sockets : 1
UDP sockets : 0

SSH server
-----
Enabled : Yes
TCP keep alives : enabled
Allowed versions : ssh-version-2

Telnet server
-----
Enabled : No

SNMP
-----
SNMP
Enabled : No

XMP server
-----
Enabled : No

Quality of Service
-----
Default class for forwarded traffic : class-1
Default drop-profile for forwarded traffic : green
Default class for local traffic : class-1
Default drop-profile for local traffic : green

operational> 0

```

## Verifying interface configuration

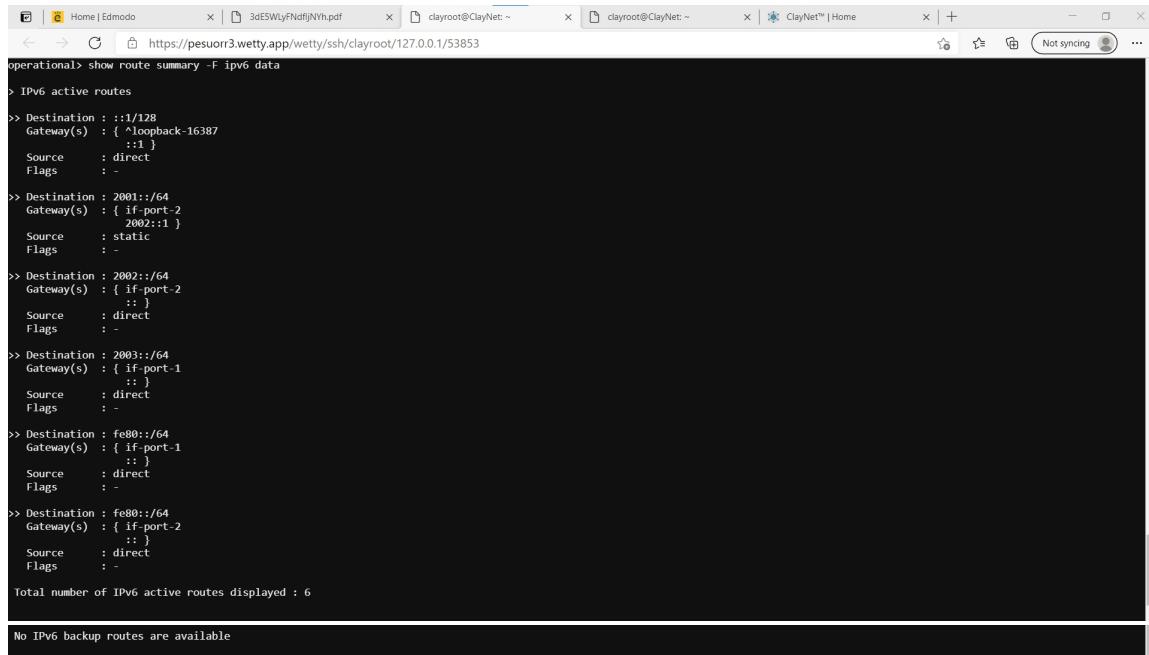
```

operational> show interface all
Interface name          Status   Encaps- IP address
                    ulation
-----
if-port-1             up      ethernet 2003::1/64
                           fe80::a026:ff:fe00:76/64
if-port-2             up      ethernet 2002::2/64
                           fe80::a026:ff:fe00:77/64
if-port-3             down    ethernet -
if-port-4             down    ethernet -
if-port-5             down    ethernet -
if-port-6             down    ethernet -
if-port-7             down    ethernet -
if-port-8             down    ethernet -
management           disabled ethernet 10.0.0.12/24

Total number of interfaces displayed : 9
operational> 0

```

## Routing Table Entry after configuration



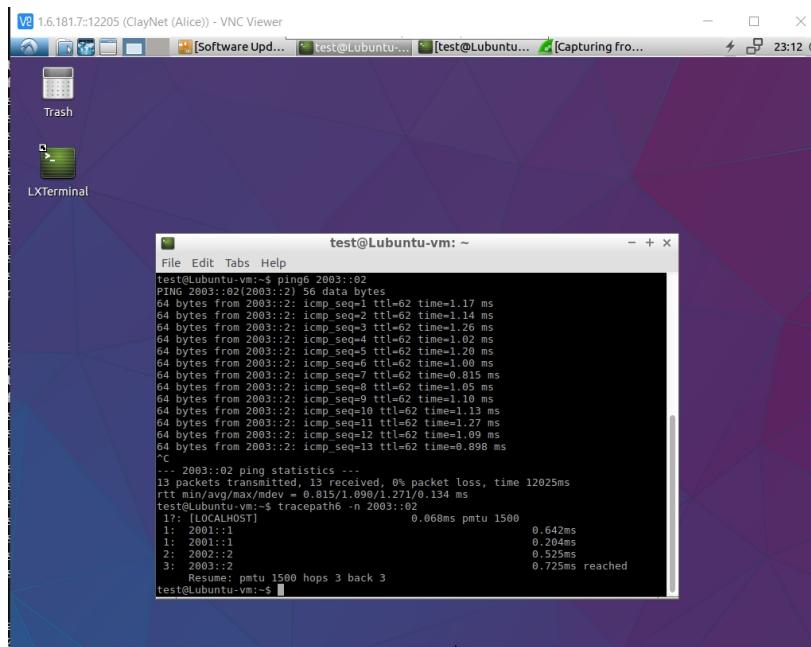
```

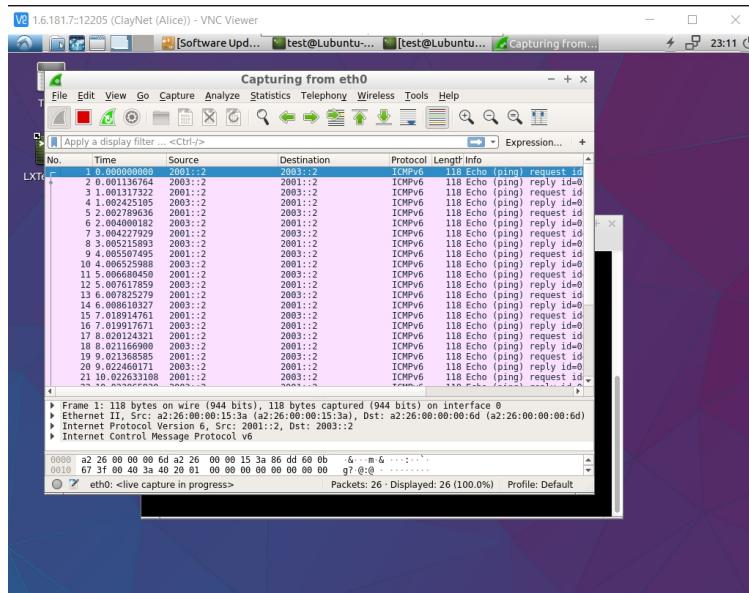
operational> show route summary -F ipv6 data
> IPv6 active routes
>> Destination : ::1/128
  Gateway(s) : { ^loopback-16387
                  ::1 }
  Source      : direct
  Flags       : -
>> Destination : 2001::/64
  Gateway(s) : { if-port-2
                  2002::1 }
  Source      : static
  Flags       : -
>> Destination : 2002::/64
  Gateway(s) : { if-port-2
                  :: }
  Source      : direct
  Flags       : -
>> Destination : 2003::/64
  Gateway(s) : { if-port-1
                  :: }
  Source      : direct
  Flags       : -
>> Destination : fe80::/64
  Gateway(s) : { if-port-1
                  :: }
  Source      : direct
  Flags       : -
>> Destination : fe80::/64
  Gateway(s) : { if-port-2
                  :: }
  Source      : direct
  Flags       : -
Total number of IPV6 active routes displayed : 6

No IPv6 backup routes are available

```

## Verifying the traffic flow between Alice and Bob





## Verifying auto-configured link local address on ipv6 interfaces

### Router 1:

```

operational> show interface details if-port-1
> Interface : if-port-1
General Information
-----
ID          : 19
Encapsulation : ethernet
MTU         : 1500
Base port type : fast-ethernet
Base port location : { shelf-1 { active-controller base-slot } port-1 }

State Information
-----
State       : up
Last state transition : 21:20:02, Sunday, April 11, 2021 IST
Work flags   : -- -- ----

Ethernet information
-----
VLAN tagging : disabled

IP information
-----
Router      : data

IPv6 information
-----
Address     : 2001::1
Netmask    : ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff
Link local Address : fe80:a026:ff:fe00:6d
Link local Netmask : ffff:ffff:ffff:ffff:ffff:ffff:ffff:ffff
Scope zone  : 33488915
Preference   : 1
Metric      : 1

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

operational> show fast-ethernet details { shelf-1 { active-controller base-slot } port-1 }
> Port : { shelf-1 { active-controller base-slot } port-1 }

Port details
-----
Name        :
MAC address : a2:26:00:00:00:6d
POST        : passed
Media       : copper
Loop back mode : no-loopback
State       : up
Duplex mode : half-duplex
Speed       : ten-mbps
Work flags  : ---- ----

operational>

```

### Router 2:

```

F | Home | Edmodo | 3dESWLyFNdfjNYh.pdf | clayroot@ClayNet: ~ | clayroot@ClayNet: ~ | ClayNet™ | Home | + | - | □ | Not syncing | ...
https://pesuor3.wetty.app/wetty/ssh/clayroot/127.0.0.1/53853
operational> show interface details if-port-1
> Interface : if-port-1
General Information
-----
ID : 19
Encapsulation : ethernet
MTU : 1500
Base port type : fast-ethernet
Base port location : { shelf-1 { active-controller base-slot } port-1 }

State Information
-----
State : up
Last state transition : 21:33:42, Sunday, April 11, 2021 IST
Work flags : --- -------

Ethernet information
-----
VLAN tagging : disabled

IP information
-----
Router : data

IPv6 information
-----
Address : 2001::1
Network ID : ffff:ffff:ffff:ffff:fe80:a026:ff:fe00:76
Link local Address : fe80:a026:ff:fe00:76
Link local Netmask : ffff:ffff:ffff:ffff
Scope Zone : 3488915
Preference : 1
Metric : 1

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

operational> show fast-ethernet details { shelf-1 { active-controller base-slot } port-1 }
> Port : { shelf-1 { active-controller base-slot } port-1 }

Port details
-----
Name :
MAC address : a2:26:00:00:00:76
POST : passed
Media : copper
Loop back mode : none/loopback
State : up
Duplex mode : half-duplex
Speed : ten-mbps
Work flags : -------

operational> 

```

## Checking the connectivity between Router 1 and Router 2 using link local address:

Pinging link local address in R1.

```

operational> ping data:fe80::a026:ff:fe00:77%if_port-2
PING fe80::1f:14:a026:ff:fe00:77-> fe80::a026:ff:fe00:77%3488916
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=0 hoplimit=64 time=0.565 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=1 hoplimit=64 time=0.364 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=2 hoplimit=64 time=0.376 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=3 hoplimit=64 time=0.353 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=4 hoplimit=64 time=0.390 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=5 hoplimit=64 time=0.381 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=6 hoplimit=64 time=0.339 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=7 hoplimit=64 time=0.506 ms
16 bytes from fe80:a026:ff:fe00:77%3488916: icmp_seq=8 hoplimit=64 time=0.403 ms
```
--- PING Statistics---
9 packets transmitted, 9 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 0.000/0.409/0.565/0.072 ms
operational> 

```

Pinging link local address in R2.

```

PING fe80::1f:14:a026:ff:fe00:77-> fe80::a026:ff:fe00:6e%3488916
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=0 hoplimit=64 time=0.414 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=1 hoplimit=64 time=0.381 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=2 hoplimit=64 time=0.338 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=3 hoplimit=64 time=0.446 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=4 hoplimit=64 time=0.448 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=5 hoplimit=64 time=0.385 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=6 hoplimit=64 time=0.383 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=7 hoplimit=64 time=0.395 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=8 hoplimit=64 time=0.395 ms
16 bytes from fe80:a026:ff:fe00:6e%3488916: icmp_seq=9 hoplimit=64 time=0.443 ms
```
--- PING Statistics---
10 packets transmitted, 10 packets received, 0.0% packet loss
round-trip min/avg/max/std-dev = 0.000/0.407/0.463/0.039 ms
operational> 

```