**Setting up Virtual Network between Namespaces**

This guide outlines the steps to create two namespaces named ***blue-namespace*** and ***lemon-namespace***, and establish a virtual Ethernet network between them using ***veth*** interfaces. The goal is to enable communication between the namespaces and allow them to ping each other.

**Prerequisites**

* Linux operating system
* Root or sudo access
* Packages

sudo apt update

sudo apt upgrade -y

sudo apt install iproute2 -y

sudo apt install net-tools

sude apt install curl tcpdump telnet iputils-ping -y

**Steps**

**1. Enable IP forwarding in the Linux kernel:**

sudo sysctl -w net.ipv4.ip\_forward=1

This step enables IP forwarding in the Linux kernel, allowing the namespaces to communicate with each other.

**2. Create namespaces:**

sudo ip netns add blue-namespace

sudo ip netns add lemon-namespace

This step creates two namespaces named ***blue-namespace*** and ***lemon-namespace***.

**3. Create the virtual Ethernet link pair:**

sudo ip link add veth-blue type veth peer name veth-lemon

This command creates a virtual Ethernet link pair consisting of veth-blue and veth-lemon at ***root namespace***.

In order to verify, run sudo ip link list

**Expected Output:**

**4. Set the cable as NIC**

sudo ip link set veth-blue netns blue-namespace

sudo ip link set veth-lemon netns lemon-namespace

This command acts as ***NIC*** link pair consisting of veth-blue and veth-lemon.

To verify run sudo ip netns exec blue-namespace ip link and sudo ip netns exec lemon-namespace ip link

But as we see, interface has been created but it's **DOWN** and has no ip. Now assign a ip address and turn it **UP**.

**5. Assign IP Addresses to the Interfaces**

sudo ip netns exec blue-namespace ip addr add 192.168.0.1/24 dev veth-blue

sudo ip netns exec lemon-namespace ip addr add 192.168.0.2/24 dev veth-lemon

In this step, IP addresses are assigned to the veth-blue interface in the blue-namespace and to the veth-lemon interface in the lemon-namespace.

To verify run sudo ip netns exec blue-namespace ip addr and sudo ip netns exec lemon-namespace ip addr

**6. Set the Interfaces Up**

sudo ip netns exec blue-namespace ip link set veth-blue up

sudo ip netns exec lemon-namespace ip link set veth-lemon up

These commands set the veth-blue and veth-lemon interfaces ***up***, enabling them to transmit and receive data.

Now run again sudo ip netns exec blue-namespace ip link

 and sudo ip netns exec lemon-namespace ip link

to verify

**7. Set Default Routes**

sudo ip netns exec blue-namespace ip route add default via 192.168.0.1 dev veth-blue

sudo ip netns exec lemon-namespace ip route add default via 192.168.0.2 dev veth-lemon

These commands set the default routes within each namespace, allowing them to route network traffic.

In order to verify run sudo ip netns exec blue-namespace ip route and sudo ip netns exec lemon-namespace ip route

**8. Test Connectivity**

sudo ip netns exec blue-namespace ping 192.168.0.2

sudo ip netns exec lemon-namespace ping 192.168.0.1

Use these commands to test the connectivity between the namespaces by pinging each other's IP address.

**Expected Output:**

PING 192.168.0.2 (192.168.0.2) 56(84) bytes of data.

64 bytes from 192.168.0.2: icmp\_seq=1 ttl=64 time=0.024 ms

64 bytes from 192.168.0.2: icmp\_seq=2 ttl=64 time=0.069 ms

64 bytes from 192.168.0.2: icmp\_seq=3 ttl=64 time=0.063 ms

64 bytes from 192.168.0.2: icmp\_seq=4 ttl=64 time=0.064 ms

64 bytes from 192.168.0.2: icmp\_seq=5 ttl=64 time=0.063 ms

^C

--- 192.168.0.2 ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 4099ms

rtt min/avg/max/mdev = 0.024/0.056/0.069/0.016 ms

**and**

PING 192.168.0.1 (192.168.0.1) 56(84) bytes of data.

64 bytes from 192.168.0.1: icmp\_seq=1 ttl=64 time=0.033 ms

64 bytes from 192.168.0.1: icmp\_seq=2 ttl=64 time=0.072 ms

64 bytes from 192.168.0.1: icmp\_seq=3 ttl=64 time=0.071 ms

64 bytes from 192.168.0.1: icmp\_seq=4 ttl=64 time=0.074 ms

64 bytes from 192.168.0.1: icmp\_seq=5 ttl=64 time=0.070 ms

^C

--- 192.168.0.1 ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 4099ms

rtt min/avg/max/mdev = 0.033/0.064/0.074/0.015 ms

**9. Clean Up (optional)**

sudo ip netns del blue-namespace

sudo ip netns del lemon-namespace