User Manual:

Navigate to the folder *~/code/test/src/topo*
To install the topo:

> **sudo make topo**
>
> This will install all the topologies for AS and SDX

To install the config:

> **sudo make config**
>
> This will install all the required config for the required topo.

Now the system is ready to perform the experiments.
To reset the system;

> Exit all the command prompt with mininet instances.
>
> **sudo make clean**

Config is done as follows:

> Let's take an example of SDX1 from the architecture diagram to understand the same.

AS1, AS2 and AS8 are connected to SDX1 as follows.

To connect to SDX:

> An **uplink** is created between AS1's border router BR1 and SX1 switch using port local.

BR1 is assigned an IP 112.168.10.1 and SX1 is assigned an IP 10.0.1.1
The following flow shows that all the packets having ingress port 1 is directed to LOCAL port of
the BR1 switch. Here the packets are routed to Linux kernel. ovs-ofctl add-flow br1
in_port=1,actions=LOCAL -O OpenFlow13

```
sudo ovs-ofctl add-flow br1 in_port=1,actions=LOCAL -O
OpenFlow13
```

A route is created from 112.168.10.1 to 10.0.1.1 in the Linux routing table to forward the packets
between the two interfaces. The packet is then forwarded to SX1 by the Linux kernel with
ingress port as LOCAL for SX1. Similarly all the other uplinks are created.

A **downlink** is created between AS1's border router BR1 and SX1 switch using a veth pair. We
create a veth pair using the following command.

```
sudo ip link add veth10 type veth peer name veth11
```

After creating the pair we assign each end of the pair to BR1 and SX1 respectively using the
following commands.

```
sudo ovs-vsctl add-port br1 veth11
sudo ovs-vsctl add-port sx1 veth10
```

Using the same principle all the other downlinks are created.

A separate method of uplink and downlink is required to avoid a loop in the network.

Topology:

The topology used in each AS is explained in the Report accompanied with this manual.

Clean:

Clean reverses all the changes made to the system. Make sure to use clean whenever any mininet instance shuts down. Before restarting make sure to run ***sudo make clean.***