SDN Ad-hoc case1 step by step manual

Video https://youtu.be/YU87UR3MwPY (SDN_Adhoc)

Topology : [**SDN_Adhoc (case1)**]

Under VMImage: /home/estinet/EstiNet/SDN/SDN_Wi-Fi_Ad-hoc/Ad-hoc.tar.bz2

Execute

[1]**#tar xvf Ad-hoc.tar.bz2**
[2]**#cd Ad-hoc**
[3]**#tar xvf SDN_Adhoc \(case1\).tar.bz2**

Step 1 Draw Topology

Please open EstiNet Network Simulator. Under D mode D, we would like to draw a topology. Firstly, select a node **SDN Controller** under group **SDN Wi-Fi Ad Hoc** as Figure 1. Then click it on working area. Select a nodes **SDN MN** (SDN Mobile Node) under group **SDN Wi-Fi Ad Hoc** as Figure 1. Then click it on working area three times as Figure 1.

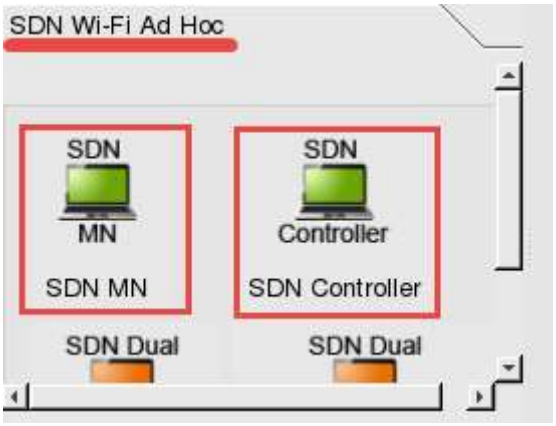


Figure 1 Select SDN Controller and SDN MN

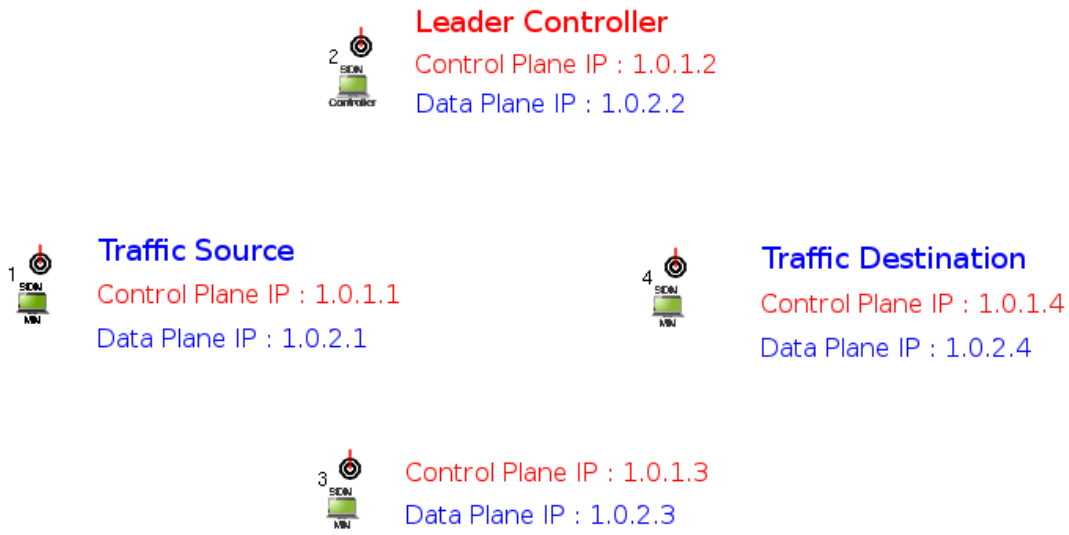


Figure 2 Topology deployment

Step 2 Edit Property

In step 2, after complete the topology deployment as Figure , please change to E mode  to do the settings of each node.

Step 3 Set Leader Controller and Replicated Controller

It will set the controller role, either **Leader Controller** or **Replicated Controller**. Here, it set the **Leader Controller** as an example. Double click **node 2** (SDN Controller) which is set as a Leader Controller. Then click **Node Editor** to go into a dialog of Protocol Module as Figure 3.

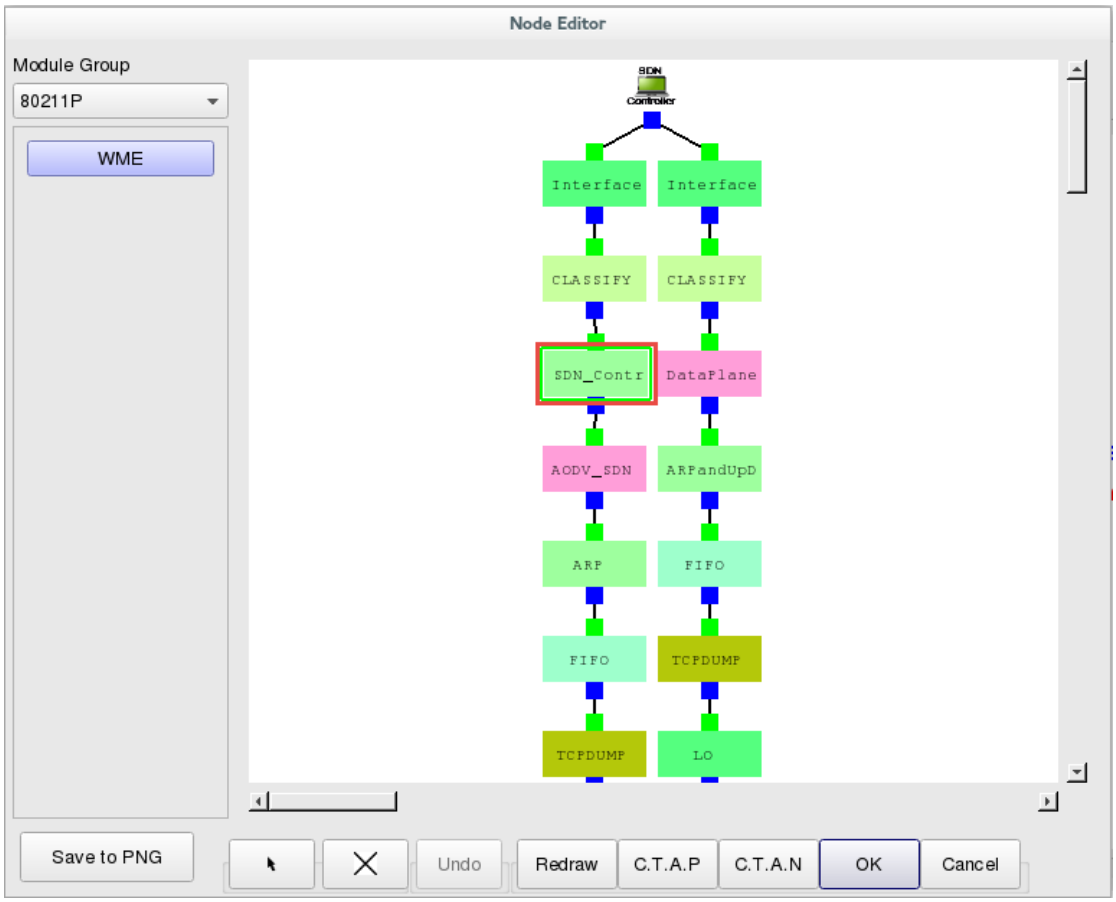


Figure 3 Protocol Module of node 2 (SDN Controller)

Double click module **SDN_Controller**, it will pop a dialog as Figure 4. Select "**Leader Controller**" here. If someone would like to set "**Replicated Controller**", please select role "**Replicated Controller**" and set "**Leader Controller IP**" here.

Figure 4 Set Leader Controller or Replicated Controller

Step 4 Set SDN Agent

In step4 set the Leader Controller IP into module **SDN_Agent**. To check Leader Controller IP in Node2 by moving the mouse curser on Node2 as Figure . The Leader Controller IP is 1.0.1.2 here.

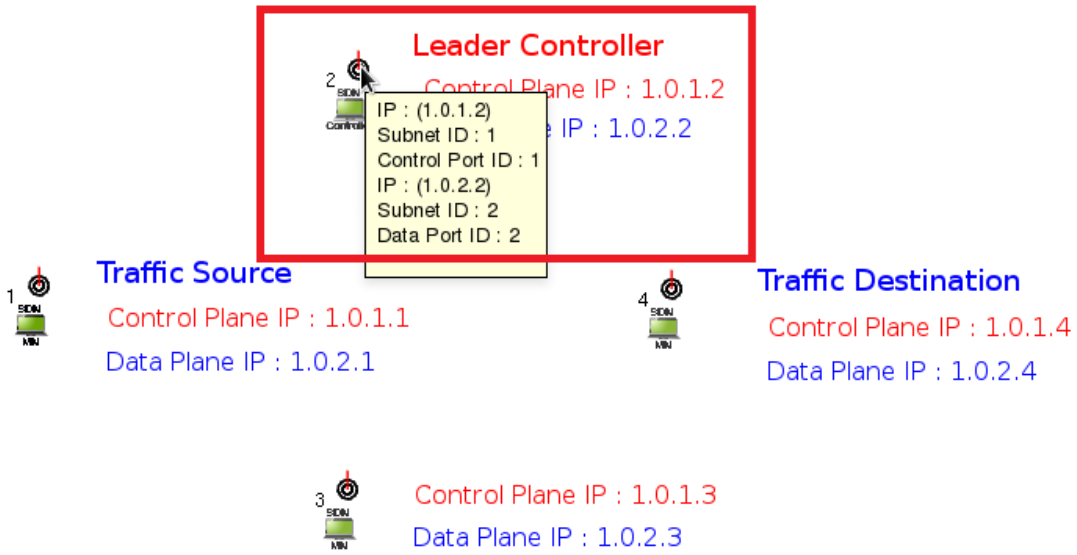


Figure 5 Check Leader Controller IP

Double click Node1 (SDN MN), then click **Node Editor** to go into a dialog of Protocol Module as Figure 6.

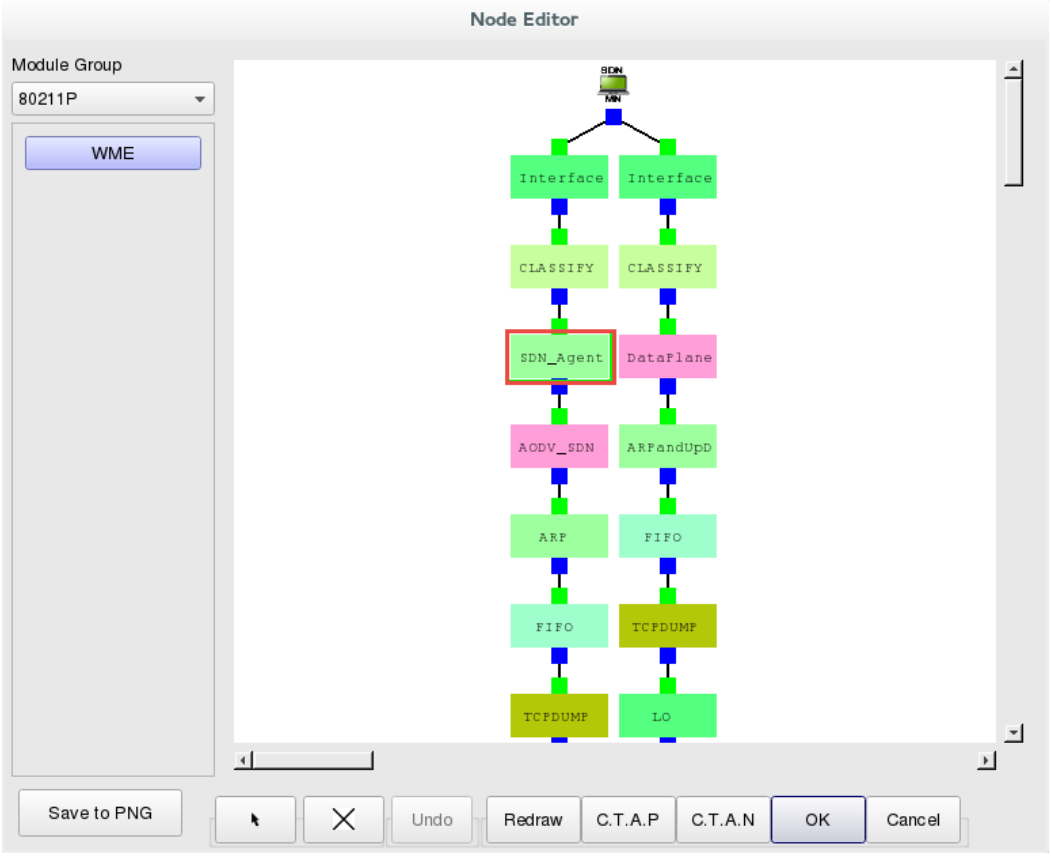


Figure 6 Protocol Module of node 6 (SDN MN)

Double click **SDN_Agent** and set the 1st Leader Controller IP here. If user need to set other Controller IP, please set it sequentially from 2nd to 10th. Click check box [x] to enable this setting as Figure 2 , then click OK.

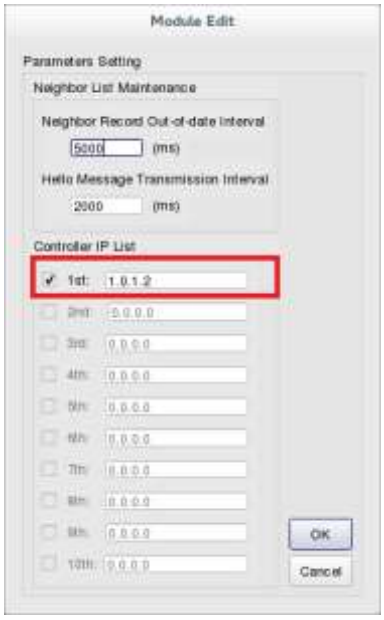


Figure 2 to set the necessary Controller IP

To save the time that set the Controller IP in each **SDN MN**, it just needs to click module **SDN_Agent** then click button "**C.T.A.N**" (Copy to all modules on all nodes with the same type). It will pop a dialog of "**Select Nodes**". Please click button "**Select All**" and "**OK**'. This action will copy the settings in module **SDN_Agent** which include all Controller IP to other **SDN MN** such as Node3 and Node4 which have the same **SDN_Agent** module as Figure 8.

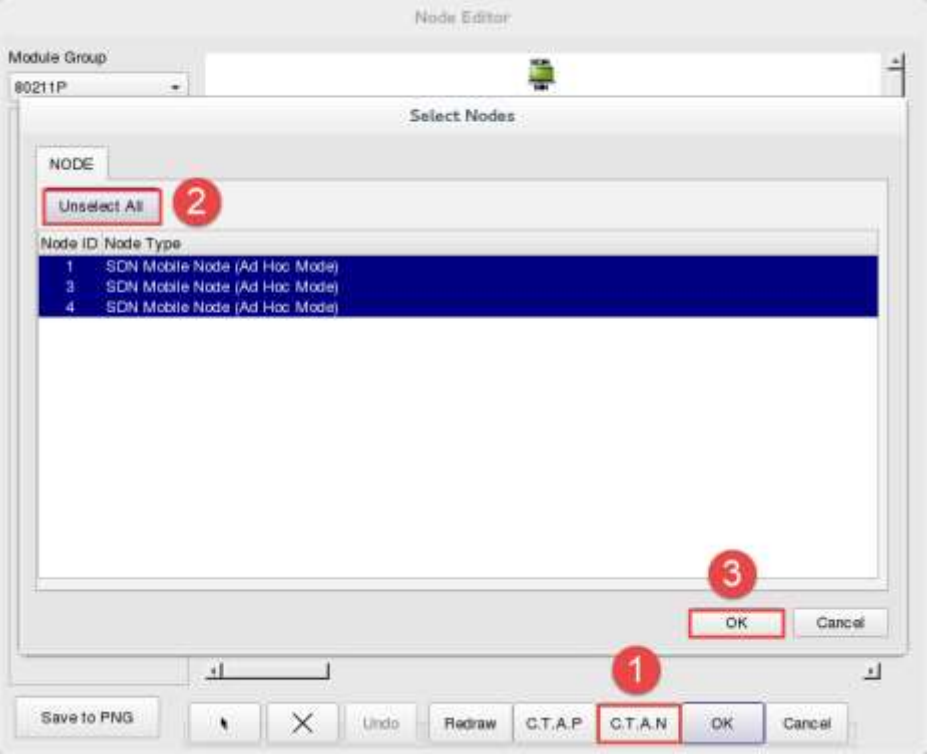


Figure 8 to set C.T.A.N

Step 5 Set the traffic source

In this step, it will set the traffic for sender. Here the traffic will be set from Node 1 to Node 4 on Data Plane. The Data Plane IP of node 4 is 1.0.2.4 as Figure 9.

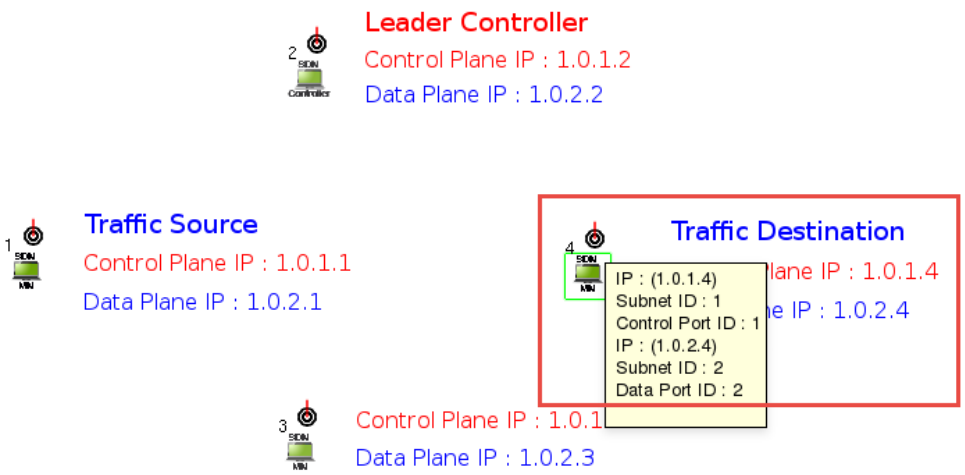


Figure 9 To check Data Plane IP of Node 4

Double click Node 1 (traffic source). Click tab **Application** and click button **Add.** Please input command "**ttcp -t -s -p 8000 1.0.2.4 -L 1.0.2.1**" as Figure 3 to complete the sender command settings. Node 1 will send TCP packets to Node4 on port 8000. Parameters " **-L 1.0.2.1**" is the traffic source IP on data plane. For the command usage of "**ttcp**", please click button "**App. Usage**" for more details.

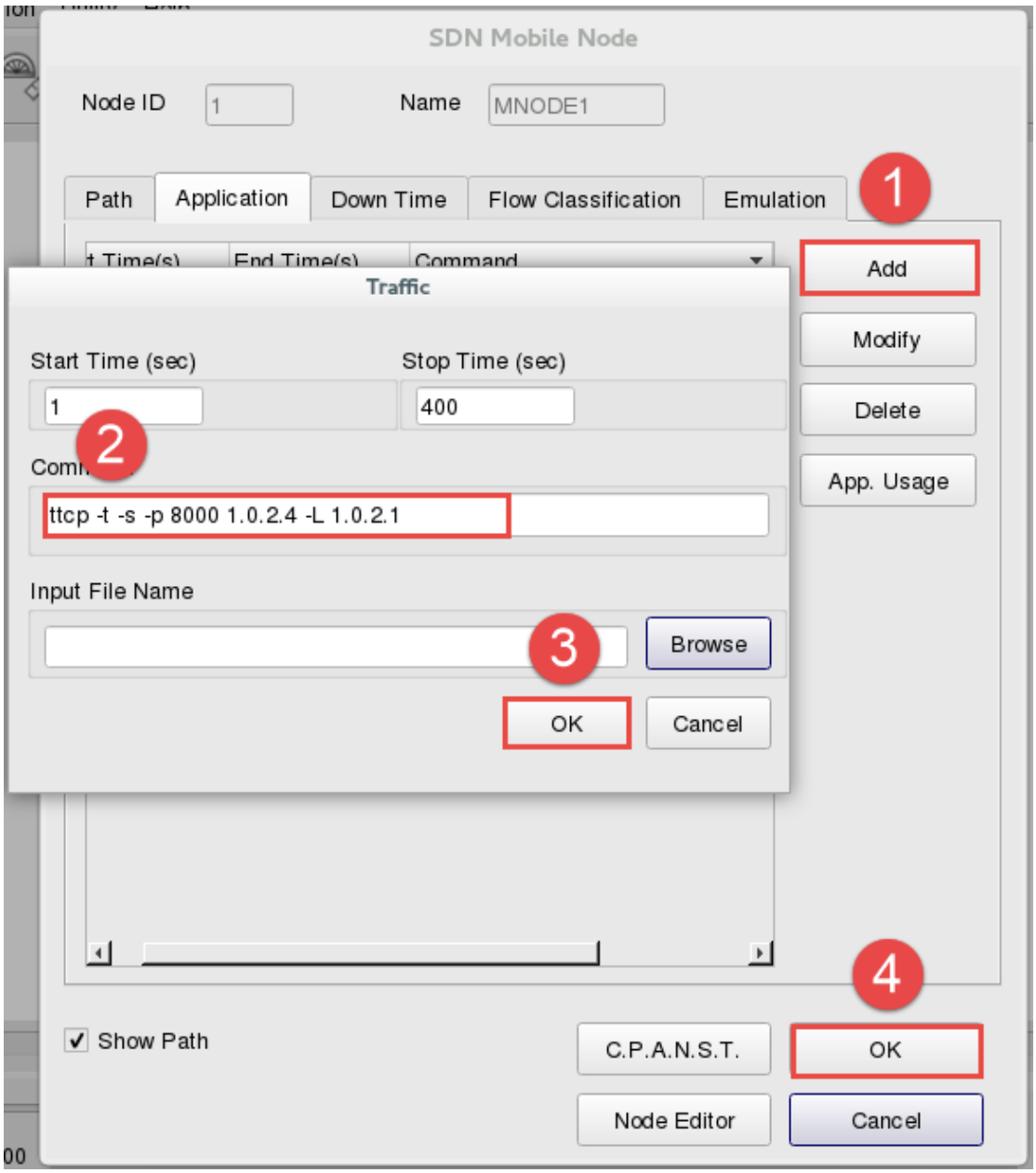


Figure 3 To set command for traffic source

Step 6 Set the traffic destination

In this step, it will set Node4 as the traffic destination on Data Plane. Double click Node 4 (traffic destination) , then click tab **Application** and click button "**Add**" to input command **"ttcp -r -s -p 8000 -w log1**" as Figure 11. Node 4 will receive TCP packets from Node1 on port 8000. User could check log file **log1** which at the path of topology folder such as [**SDN_Adhoc.results**] after simulation completed.

Figure 11 To set command for traffic destination

Step 7 Run Simulation

After complete all node settings, please change to “R mode” R. Click **Simulation** => **Run** to execute the simulation as Figure 4.

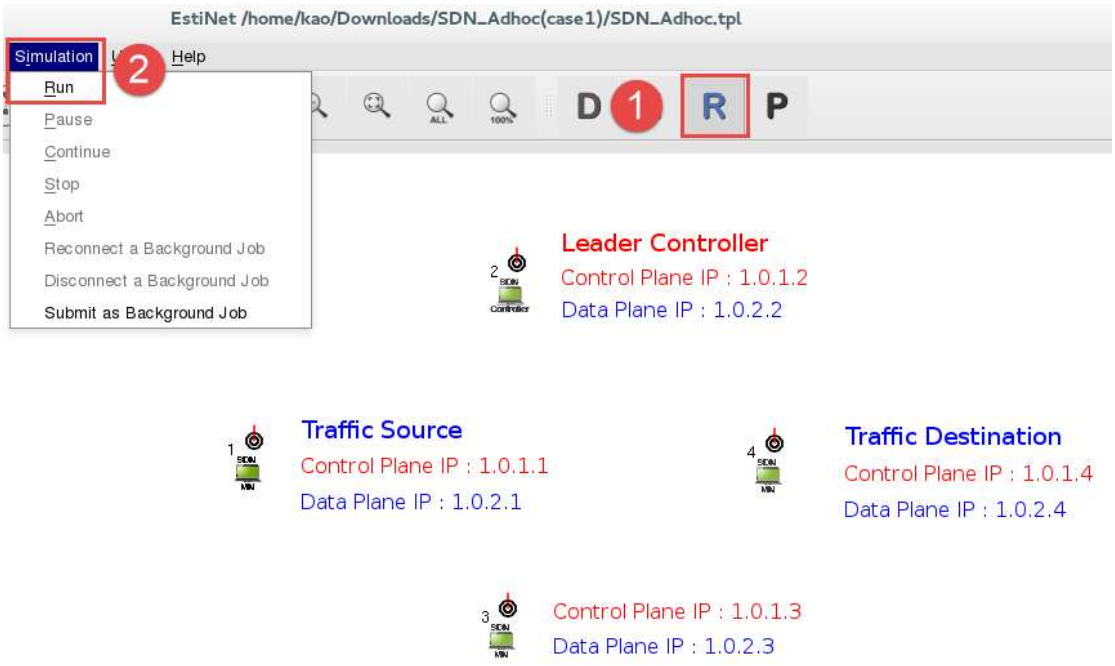
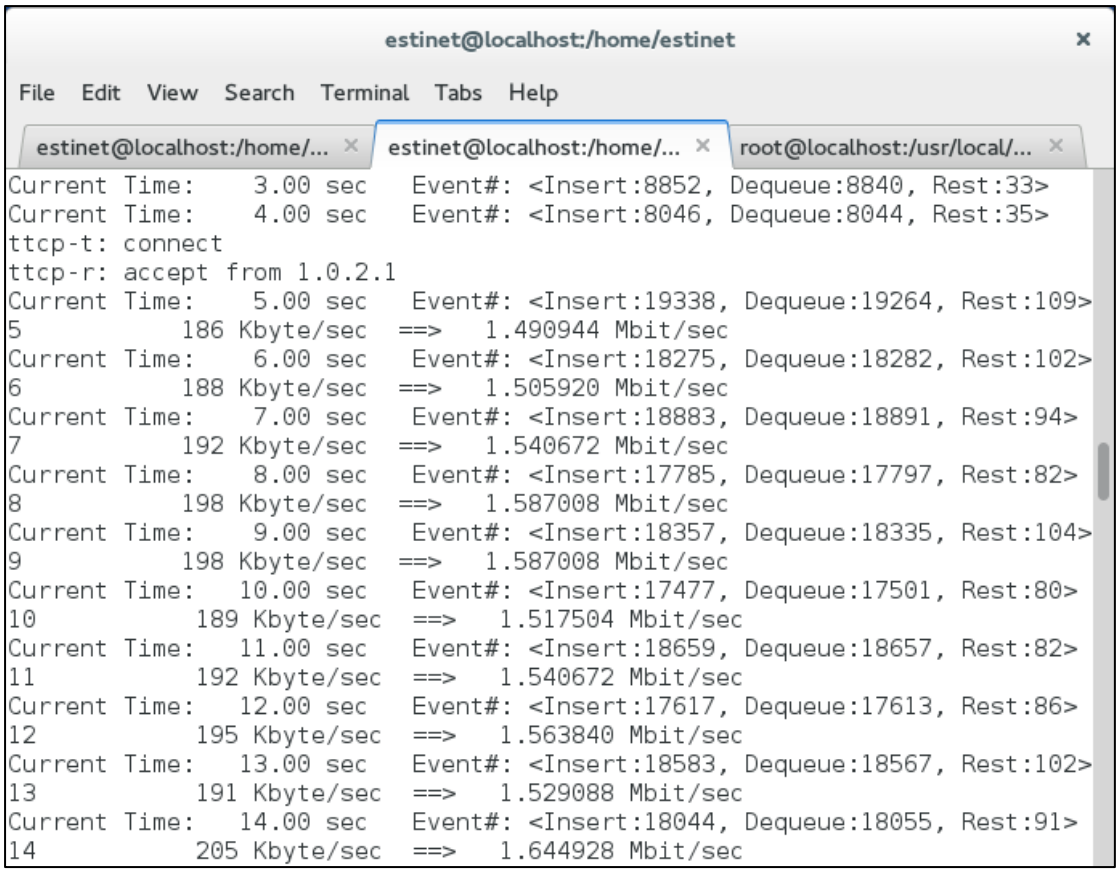


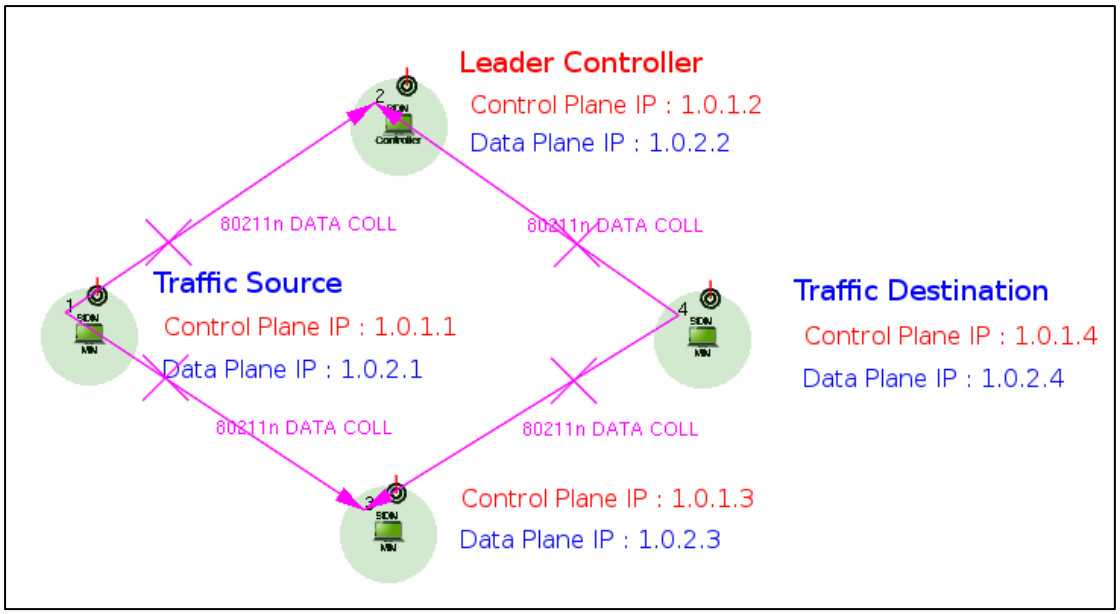
Figure 4 To run simulation

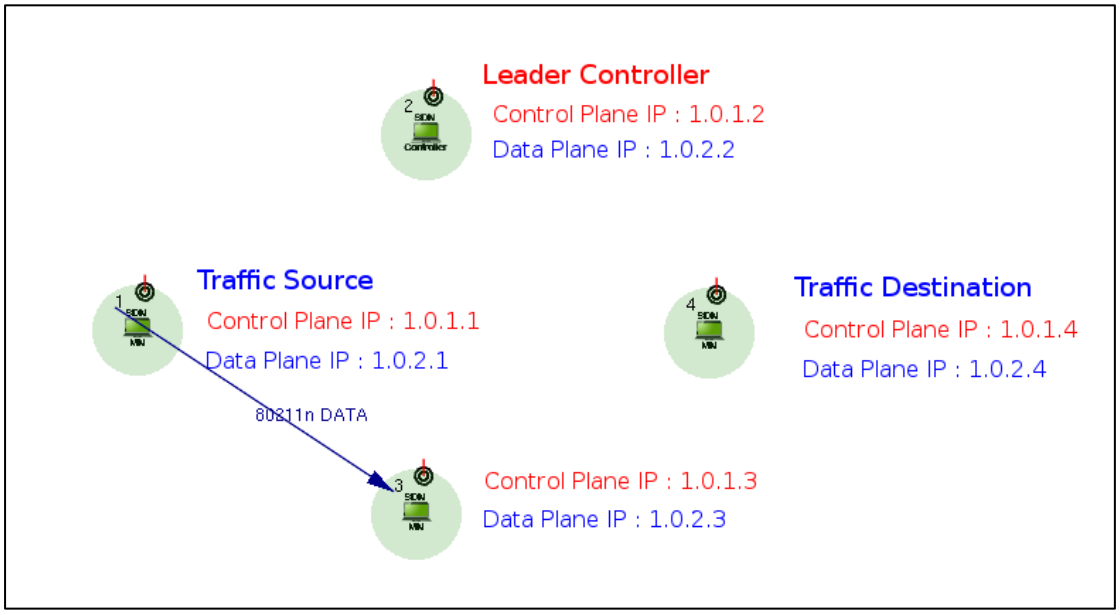
During simulation, user could check the throughput from “coordinator” terminal window as below.

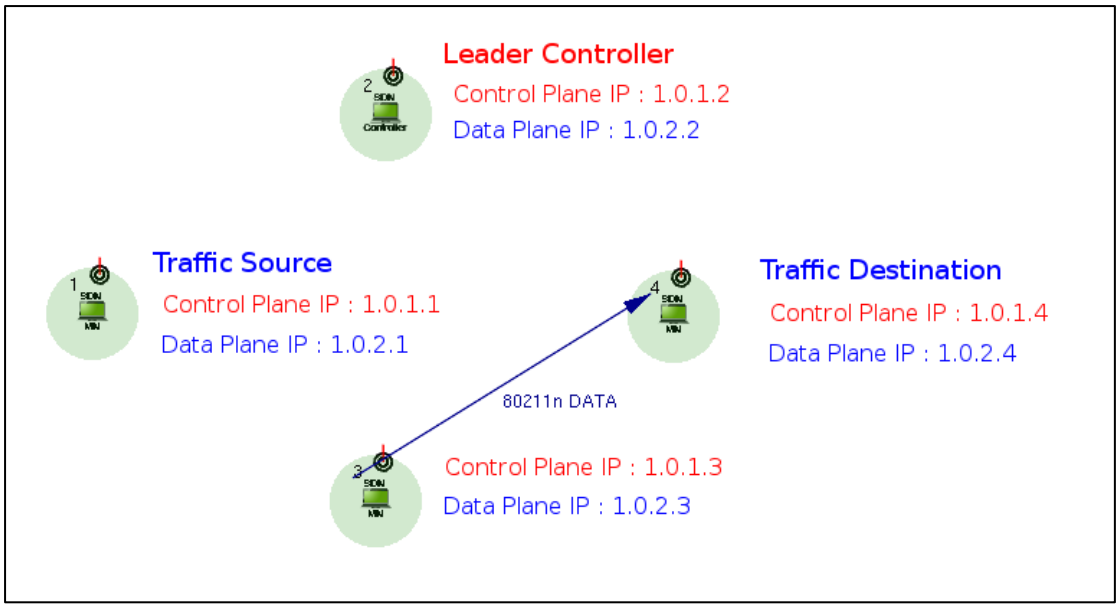


Step 8 Run Simulation

When simulation had been completed, the simulator will automatically change to “P mode”  . In P mode, it will playback the simulation results. User can see the packets animation between traffic source and traffic destination on Playback mode when user click Play button  .


Leader Controller
Control Plane IP : 1.0.1.2
Data Plane IP : 1.0.2.2
80211n DATA COLL
80211n DATA COLL
Traffic Source
Control Plane IP : 1.0.1.1
Data Plane IP : 1.0.2.1
Traffic Destination
Control Plane IP : 1.0.1.4
Data Plane IP : 1.0.2.4
80211n DATA COLL
80211n DATA COLL
Control Plane IP : 1.0.1.3
Data Plane IP : 1.0.2.3


Leader Controller
Control Plane IP : 1.0.1.2
Data Plane IP : 1.0.2.2
Traffic Source
Control Plane IP : 1.0.1.1
Data Plane IP : 1.0.2.1
Traffic Destination
Control Plane IP : 1.0.1.4
Data Plane IP : 1.0.2.4
80211n DATA
Control Plane IP : 1.0.1.3
Data Plane IP : 1.0.2.3


Leader Controller
Control Plane IP : 1.0.1.2
Data Plane IP : 1.0.2.2
Traffic Source
Control Plane IP : 1.0.1.1
Data Plane IP : 1.0.2.1
Traffic Destination
Control Plane IP : 1.0.1.4
Data Plane IP : 1.0.2.4
80211n DATA
Control Plane IP : 1.0.1.3
Data Plane IP : 1.0.2.3