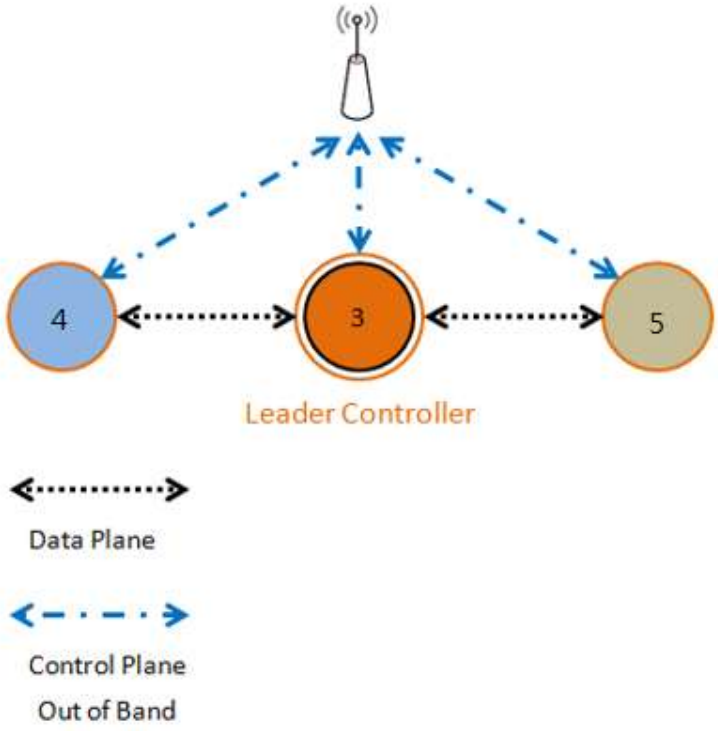
SDN Infra Ad-hoc case2 step by step manual

Video https://youtu.be/JhzCJh0WBRs (SDN_Infra_Adhoc)

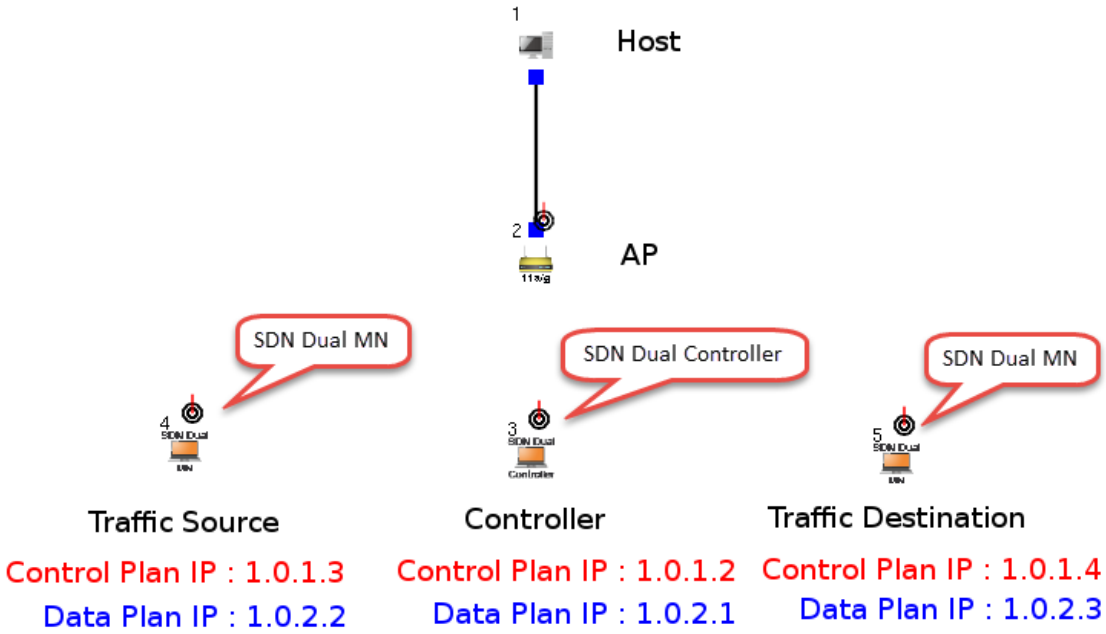
Topology: [**SDN_Infran_Adhoc(case2)]**
Under VMImage:
/home/estinet/EstiNet/SDN/SDN_Wi-Fi_Ad-hoc/Ad-hoc.tar.bz2
Execute
[1]**#tar xvf Ad-hoc.tar.bz2**
[2]**#cd Ad-hoc**
[3]**#tar xvf SDN_ Infran_Adhoc \(case2\).tar.bz2**

SDN Wi-Fi Network (Infrastructure Mode as Control Plane):

Scenario:



Constructing SDN Infrastructure Wi-Fi network in the simulator:



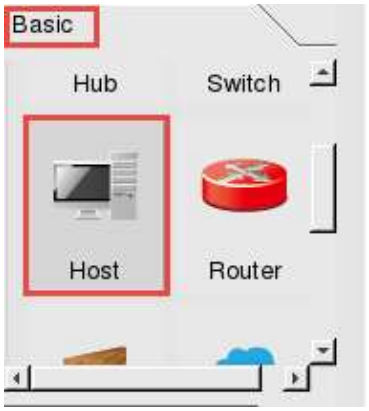
A topology is provided as an example to illustrate the procedures of deploy a topology and traffic communication. In this topology, Node 1 is a host. Node 2 is a 802.11(a/g) Access Point. Node 3 is a SDN Dual Controller. Node 4 and Node 5 are SDN Dual MN Nodes. In Control Plane, Node 3 is set as a controller. In Data Plane, Node 4 is set as a traffic source. Node 5 is set as a traffic destination.

Step 1 Draw Topology

1.) Deploying a Host

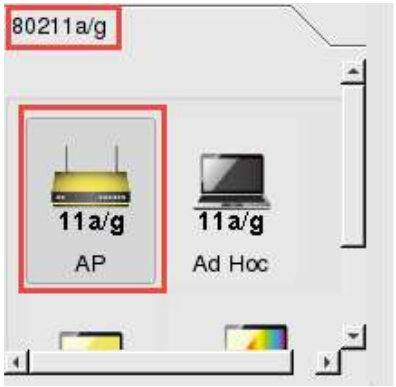
After clicking on the **Host** icon  in the tab Basic of Network Node, deploy the Host by clicking the left mouse button at the desired location in the working area. The screenshots demonstrate the actual process as below.

Click on the Host icon. And click the left mouse button at the desired location.



2.) Deploying a 802.11(a/g) Access Point

To deploy **802.11(a/g) Access Point**, first click on the 802.11(a/g) Access Point icon  in the tab of 802.11(a/g) of Network Node. Then left click at the desired location. This device enables accurate communication on the control plane of SDN Infrastructure Wi-Fi network.



3.) Deploying SDN Dual Controller Node

To deploy **SDN Dual Controller** Node, first click on the SDN Dual Controller Node icon  in the tab SDN Wi-Fi Ad Hoc. Then left click at the desired location.

4.) Deploying three SDN Dual MN Nodes

To deploy **SDN Dual MN** Nodes, first click on the SDN Dual MN Node icon  in the tab SDN Wi-Fi Ad Hoc. Then left click at the desired location two times.

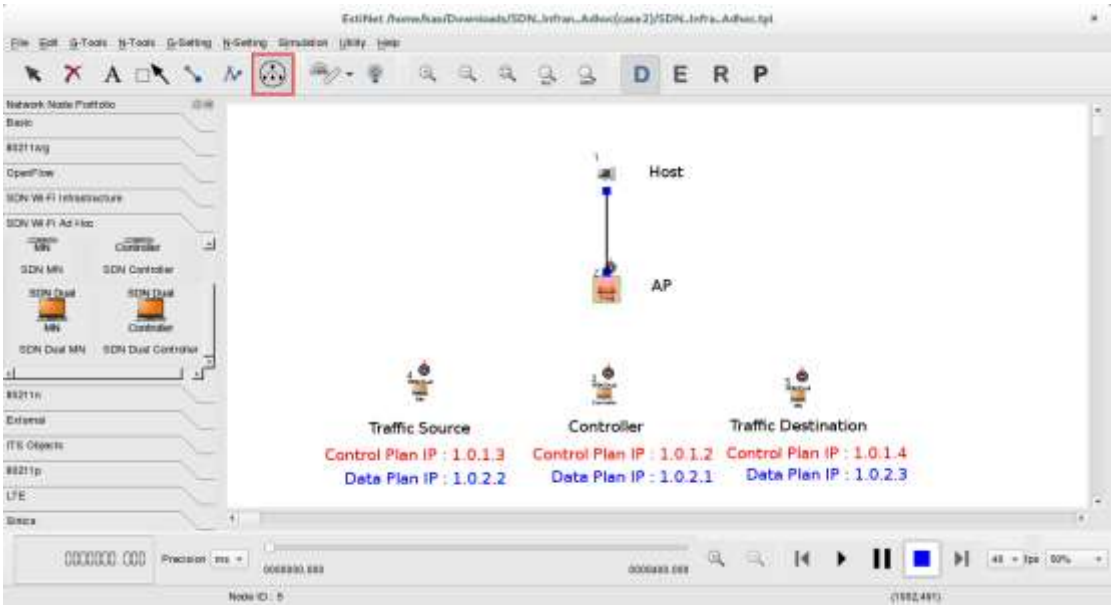
5.) Linking Host and 802.11(a/g) Access Point

To link **Host** and **802.11(a/g) Access Point**, firstly click on the "**Create a Point-to-Point Link**" icon  in the tool bar. Then left click at the **Host** and hold the mouse button. Drag the cursor from **Host** to the **802.11(a/g) Access Point**.

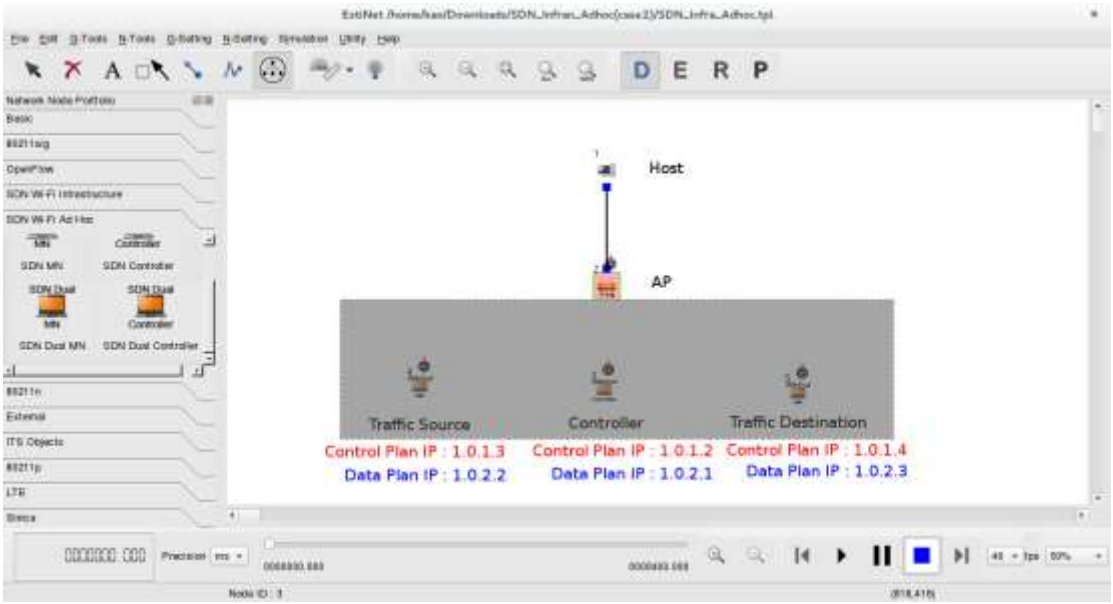
6.) Selecting control plane to form a subnet

To form a subnet, first click on the "**Select Wireless Node to form a subnet**" icon  in the tool bar.

Click on the "**Select Wireless Node to form a subnet**" icon. Then click **Node 2** 802.11(a/g) Access Point.

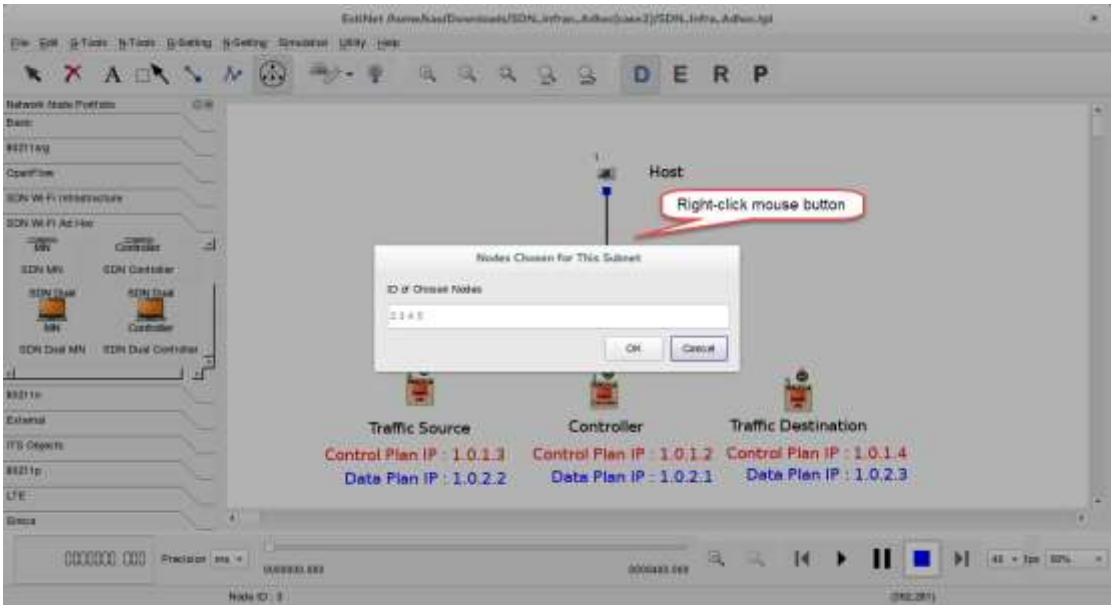


In the working area, press the left mouse button and drag the cursor to form a rectangle area which covers **Node 3、Node 4 and Node 5.**



Release the **mouse left button**.

Click the mouse right button. Then click OK button to confirm the **subnet setting** in dialog as below.

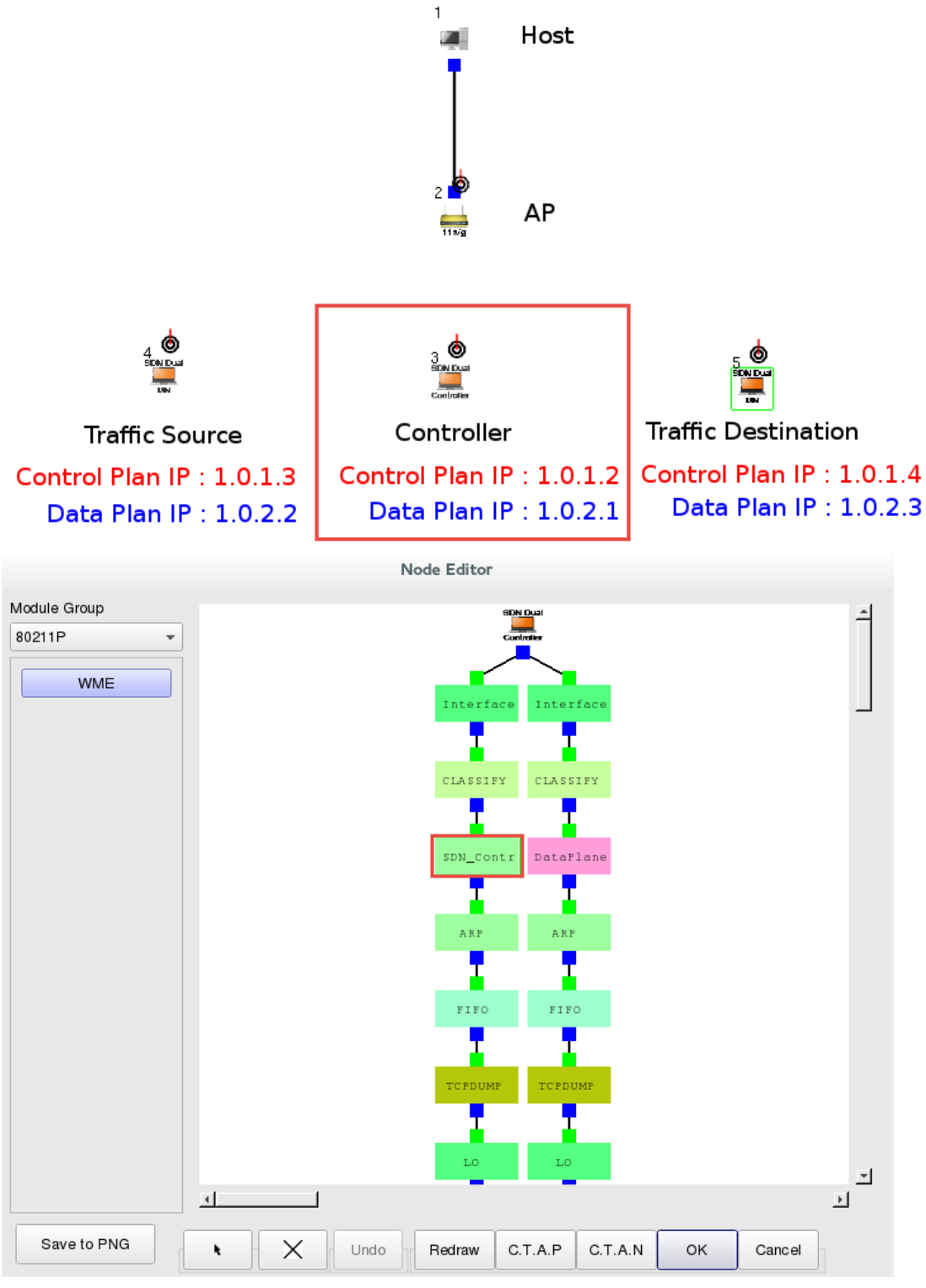


Step 2 Edit Control Plan Property

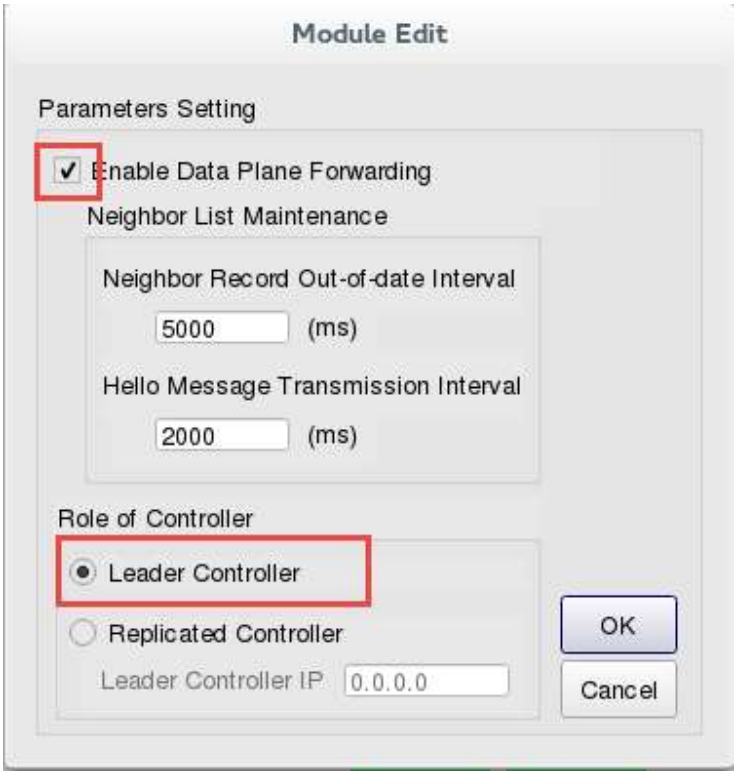
Edit Property:

It will set the role controller. The controller is either Leader Controller or Replicated Controller. Here, it set the Leader Controller in this example. Double click node 3

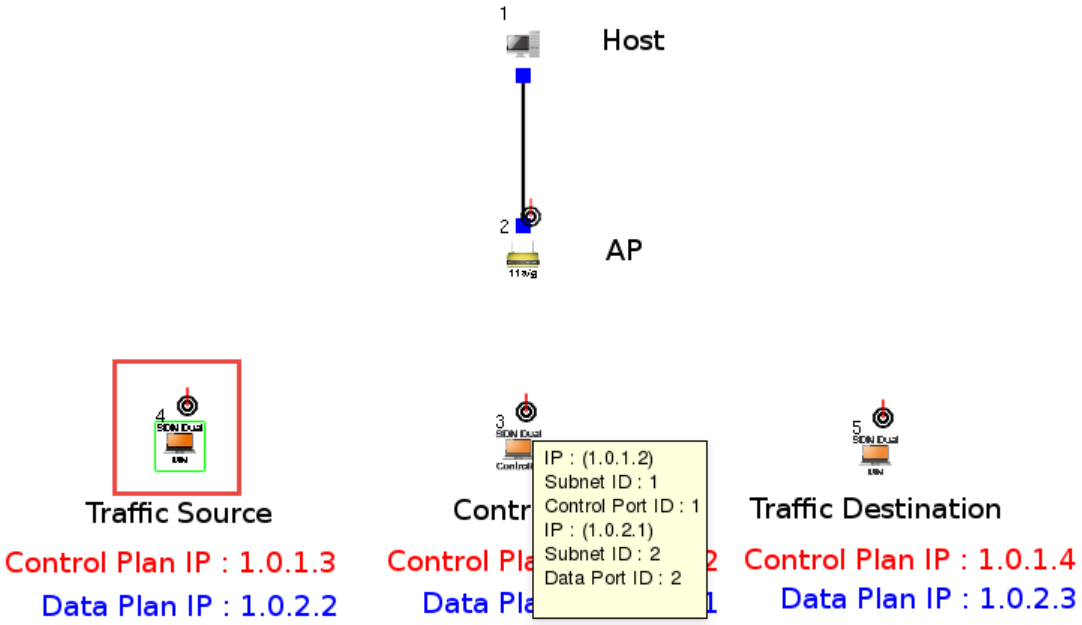
(SDN Dual Controller) which is set as a Leader Controller. Then click Node Editor to go into a dialog of Protocol Module.



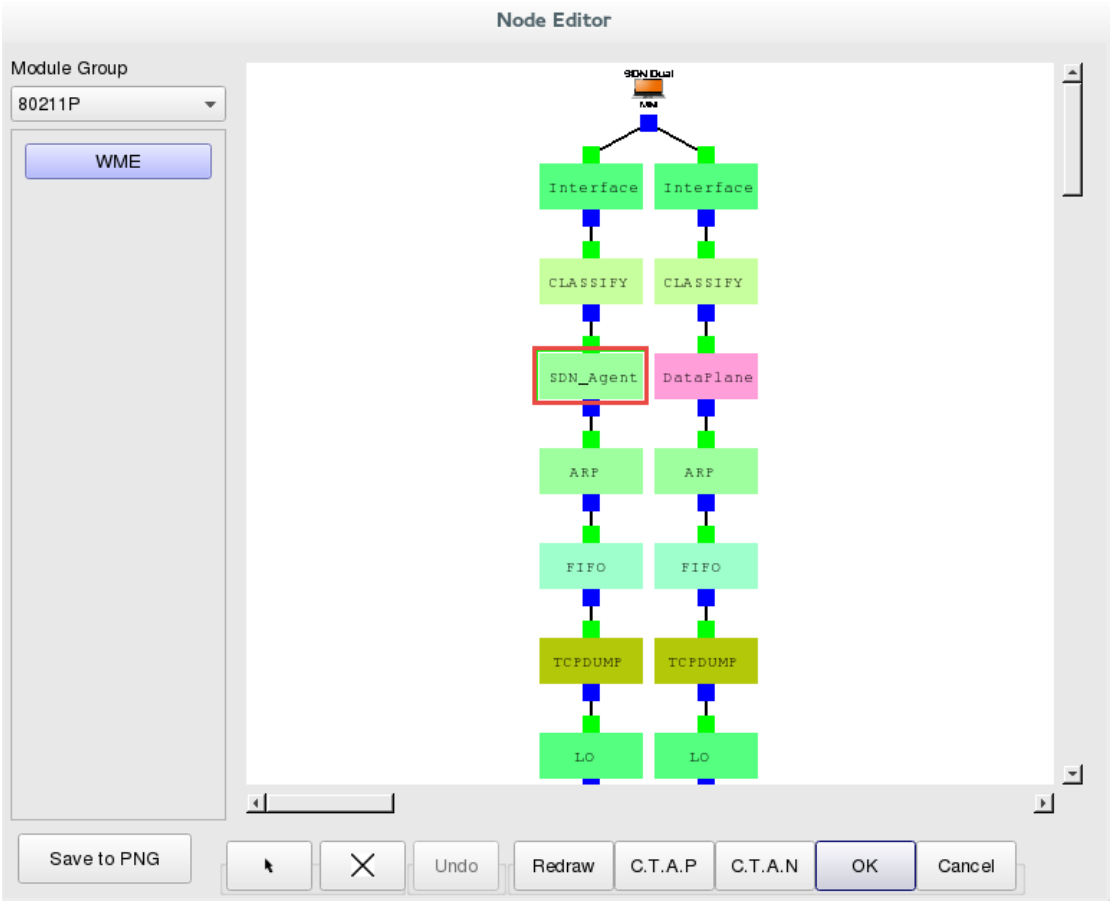
Double click module **Node 3** (SDN_Controller), then click **Node Editor**, it will pop a dialog. Select "**Enable Data Plane Forwarding**". Then select "**Leader Controller**" here. If someone would like to set "**Replicated Controller**", please select role "**Replicated Controller**" and set "**Leader Controller IP**" here.



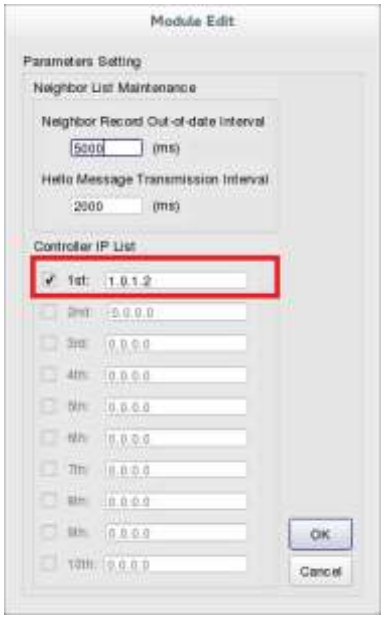
Set the Leader Controller IP into module **Node 4** (SDN_Agent). To check Leader Controller IP in Node 3 by moving the mouse curser on **Node 3**. The Leader Controller IP is 1.0.1.2 here.



Double click **Node4** (SDN MN), then click **Node Editor** to go into a dialog of Protocol Module.

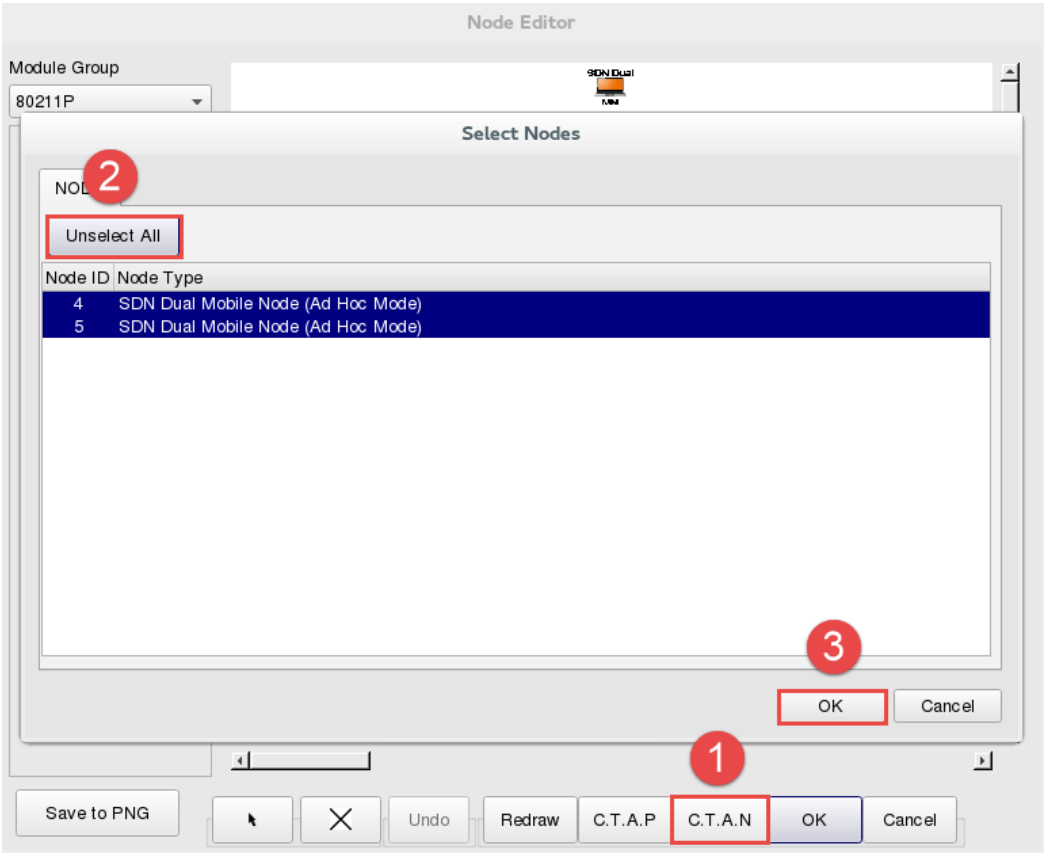


Double click module **SDN_Agent** and set the 1st Leader Controller IP here. If user need to set other Controller IP, please set it sequentially from 2nd to 10th. Click check box [x] to enable this setting, then click OK.

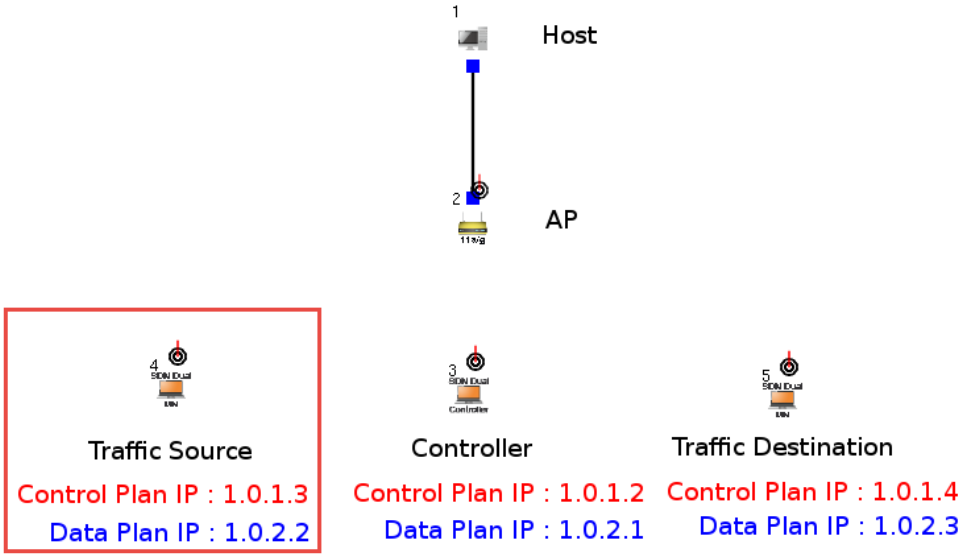


To save the time that set the Controller IP in each **SDN Dual MN**, it just needs to click module **SDN_Agent** then click button "**C.T.A.N**" (Copy to all modules on all nodes with the same type). It will pop a dialog of "**Select Nodes**". Please click button

"**Select All**" and "**OK**'. This action will copy the settings in module **SDN_Agent** which include all Controller IP to other **SDN Dual MN** such as Node5 which has the same **SDN_Agent** module.



Step 3 Configuring the UDP traffic sender



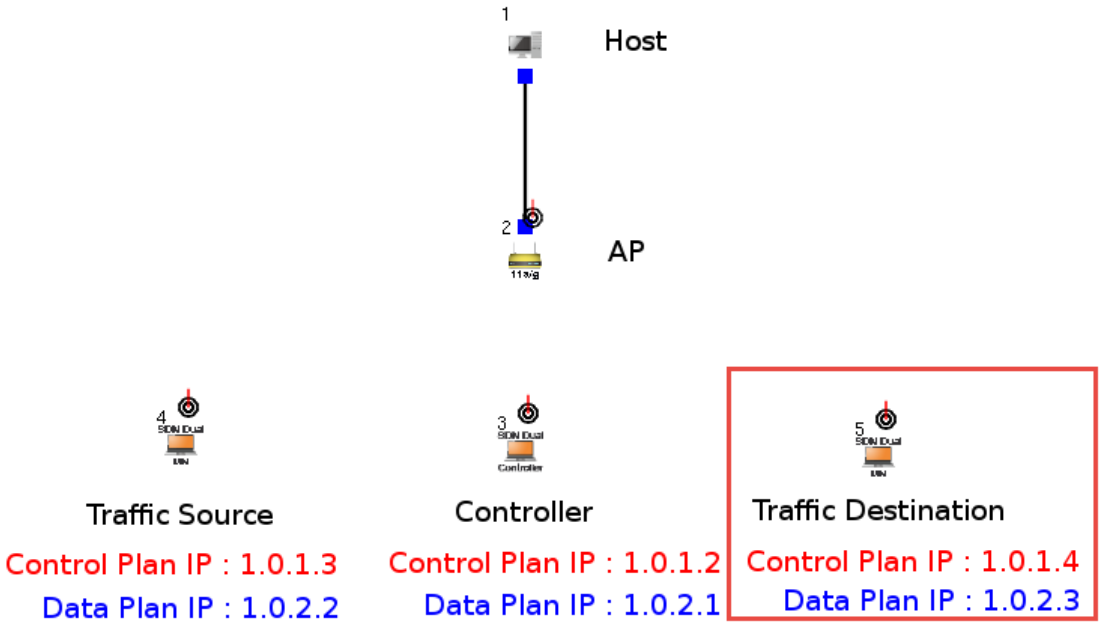
To set traffic source can make throughput with 1.35k bytes per second during the

simulation, double click **Node4** (SDN Dual MN), then click tab **Application** and click button “**Add**” in the setting window.

Set the command" **stg -i UDPconfig.Example 1.0.2.3 -lip 1.0.2.2**" into the Command column, and click button “**Browse**” which pop a window to configuration file location. We assign file " **UDPconfig.Example**" (In EstiNet VMImage, the path is /home/estinet/EstiNet/SDN/SDN_Wi-Fi_Ad-hoc/Ad-hoc/SDN_Infran_Adhoc(case2)/ UDPconfig.Example) and click button “**Open**” and “**OK**” to finish the settings. The screenshots demonstrate the actual process as below.

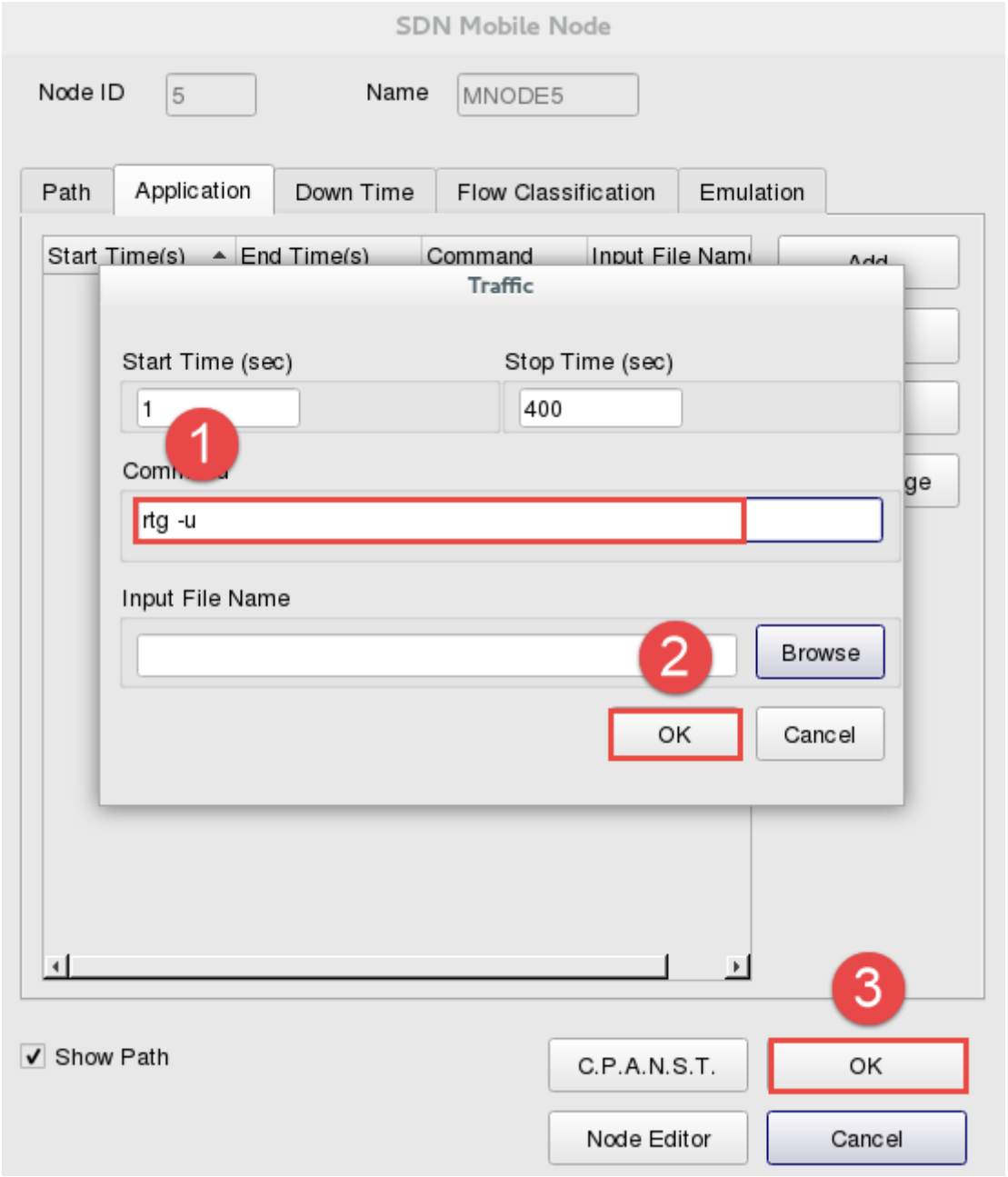
Note : The traffic source IP is 1.0.2.2 and the traffic destination IP is 1.0.2.3 on Data Plane.


SDN Mobile Node
Node ID
4
Name
MNODE4
Path
Application
Down Time
Flow Classification
Emulation
Time(s)
End Time(s)
Command
Input File Name
Add
Traffic
Start Time (sec)
Stop Time (sec)
1
400
1
Comman
ge
stg -i UDPconfig.Example 1.0.2.3 -lip 1.0.2.2
2
Input File Name
wnloads/SDN_Infran_Adhoc(case2)/UDPconfig.Example
Browse
3
OK
Cancel
4
Show Path
C.P.A.N.S.T.
OK
Node Editor
Cancel



To set traffic destination Node5 can receive UDP traffic from Node4. Double click **Node5** (SDN Dual MN), then click tab **Application** and click button "**Add**" as below figure.

Set the command "**rtg -u**" into the Command column.Click button “**OK**” to finish the settings.

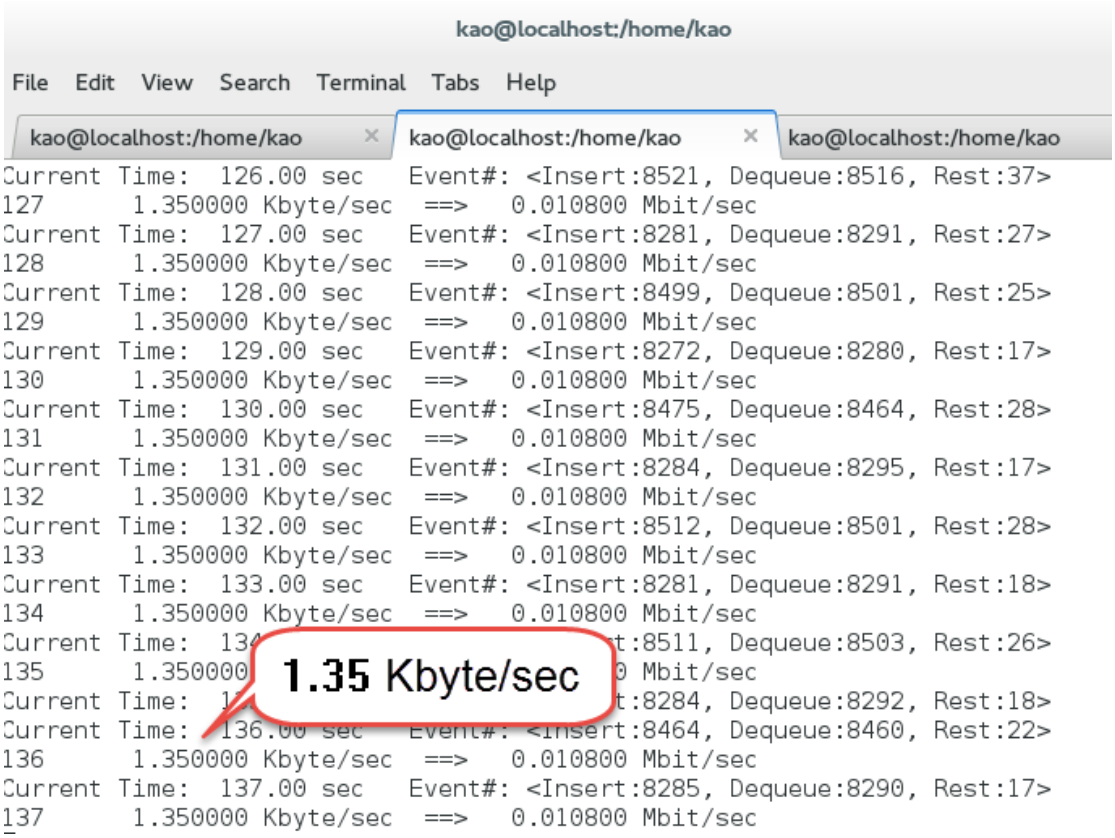


Step 4 Run Simulation

After complete all node settings, please change to “R mode” 

. Click **Simulation** => **Run** to execute the simulation.

In coordinator terminal, user may see the traffic with throughput 1.35k bytes per second when correct routing rules had been set successfully without collision.



Step 5 Play Back

User can see the packets animation between traffic source and traffic destination under Playback mode when user click Play button.