MANET implementation simulation

Aim:

To create a basic MANET implementation simulation for Packet animation and Packet Trace

Software Used:

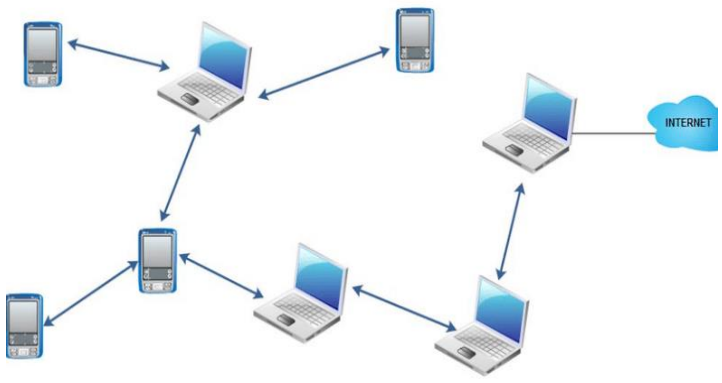
Omnet++ 5.7, INET 4.3.6 framework

Theory:

1) MANET (Mobile Adhoc NETwork) also called a wireless Adhoc network or Adhoc wireless network that usually has a routable networking environment on top of a Link Layer ad hoc network
2) They consist of a set of mobile nodes connected wirelessly in a self-configured, self-healing network without having a fixed infrastructure.
3) MANET nodes are free to move randomly as the network topology changes frequently.
4) Each node behaves as a router as they forward traffic to other specified nodes in the network.
5) MANET may operate a standalone fashion or they can be part of larger internet.
6) They form a highly dynamic autonomous topology with the presence of one or multiple different transceivers between nodes.
7) The main challenge for the MANET is to equip each device to continuously maintain the information required to properly route traffic.

The following are some of the important characteristics of MANET

1) Dynamic Topologies
2) Bandwidth constrained, variable capacity links:
3) Autonomous Behavior:
4) Energy Constrained Operation:
5) Limited Security:
6) Less Human Intervention:



A Typical example of MANET

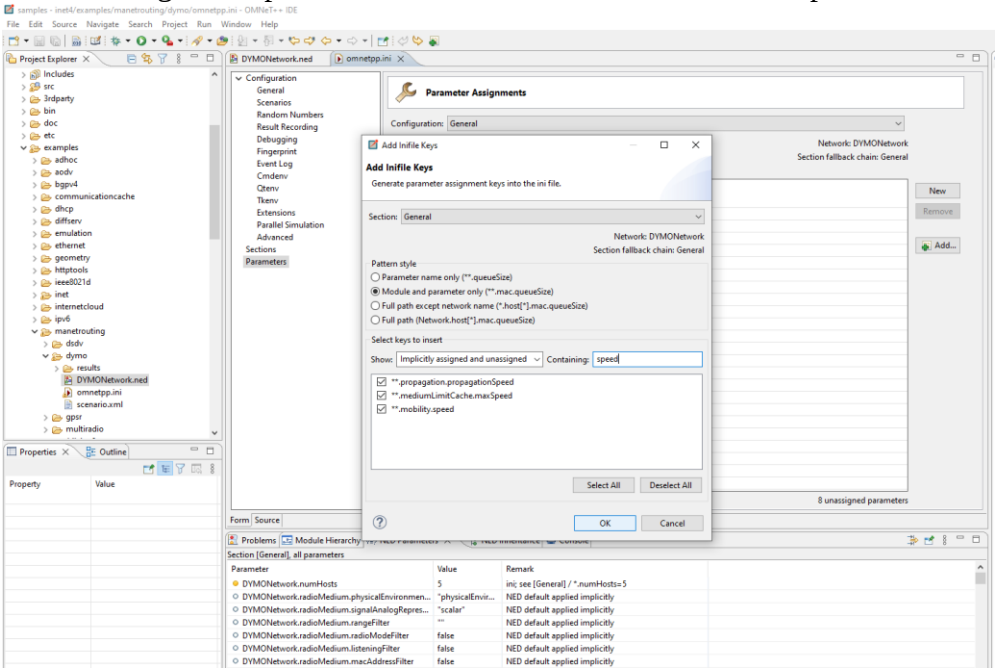
Simple steps:

1.open omnet++ then click on -

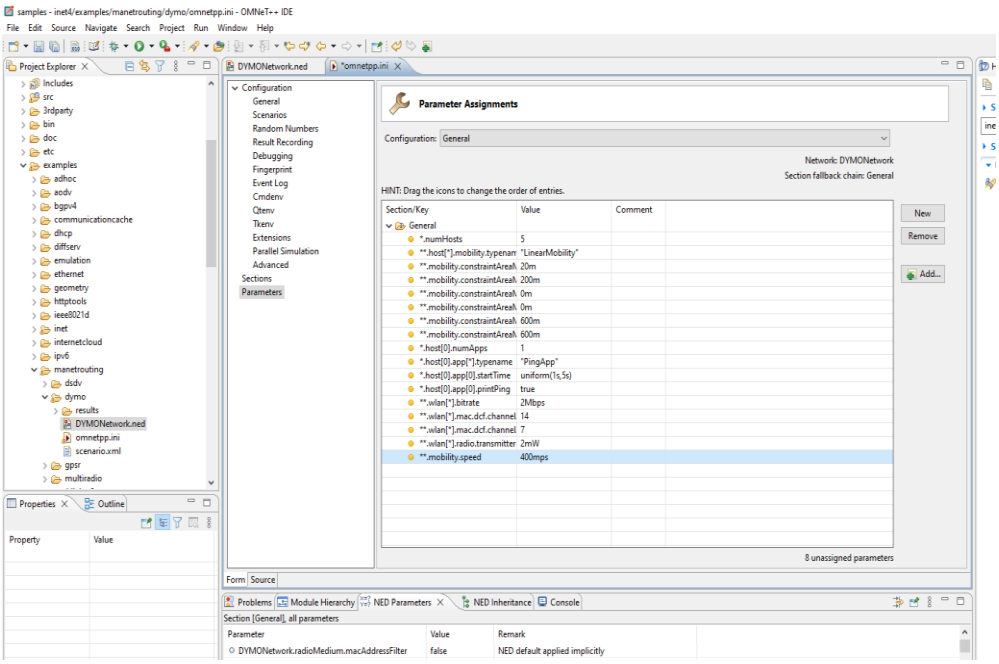
INET → examples → manetrouting → dymo and then load the DYMONetwork.ned and omnetpp.ini files by double clicking on them

2. Select omnetpp.ini file and click on parameters, we need to add mobility to the nodes

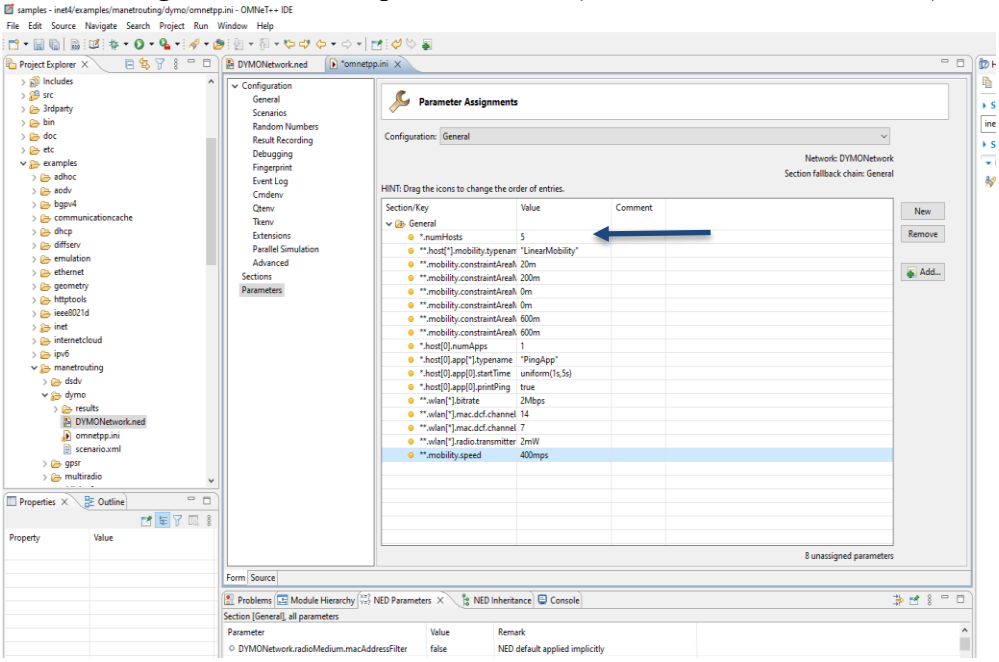
3. For adding a new parameter click on add button and add the parameter **.mobility.speed



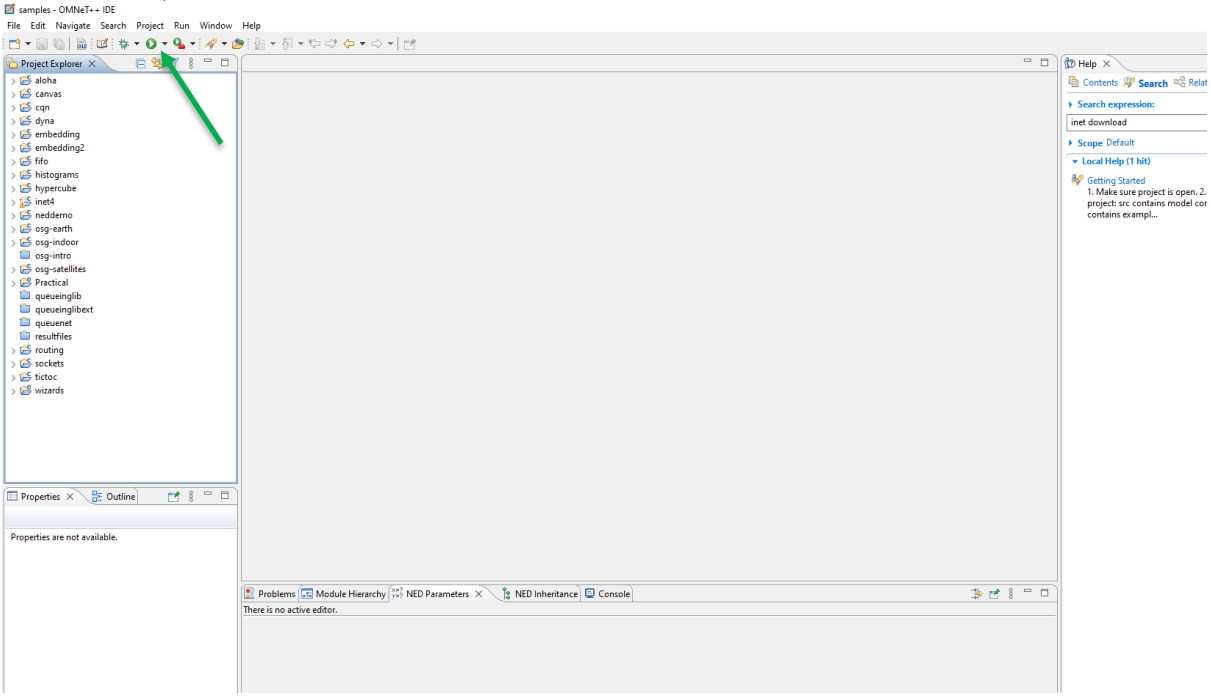
4.If you don't get the speed parameter, then click on new and Set the value for **.mobility.speed = 400mps



5.Now change the numHosts parameter to 5.(shown in blue arrow below)



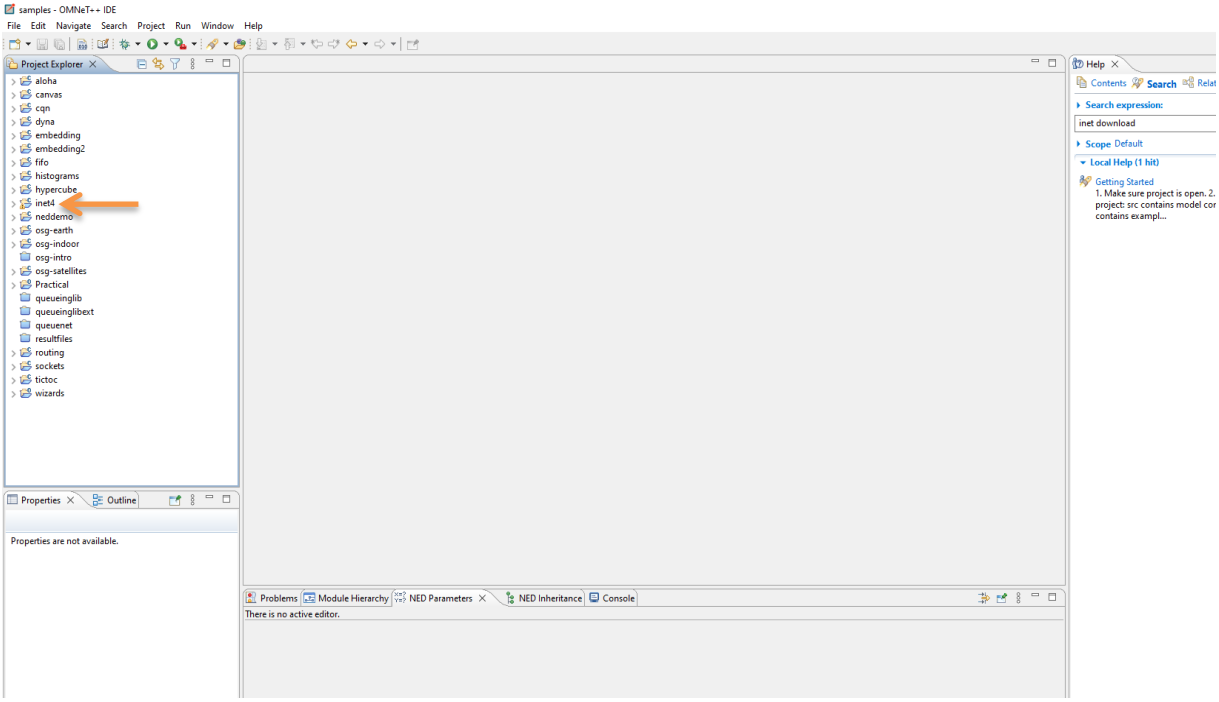
6.Now the run the simulation by going to DYMONetwork.ned (run button is shown in green arrow below)



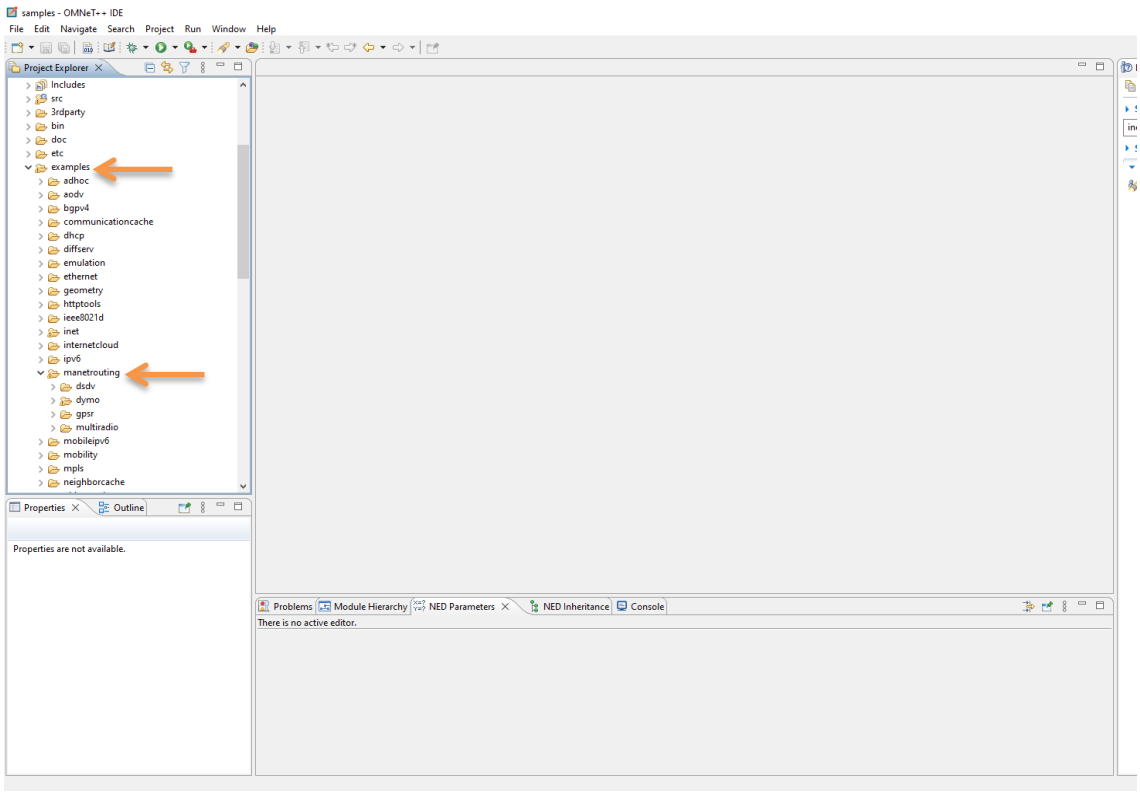
Also pause the simulation so that you can show the external your output.
Below the steps are given in more detail.

We create an MANET using Omnet++ and INET through the following steps

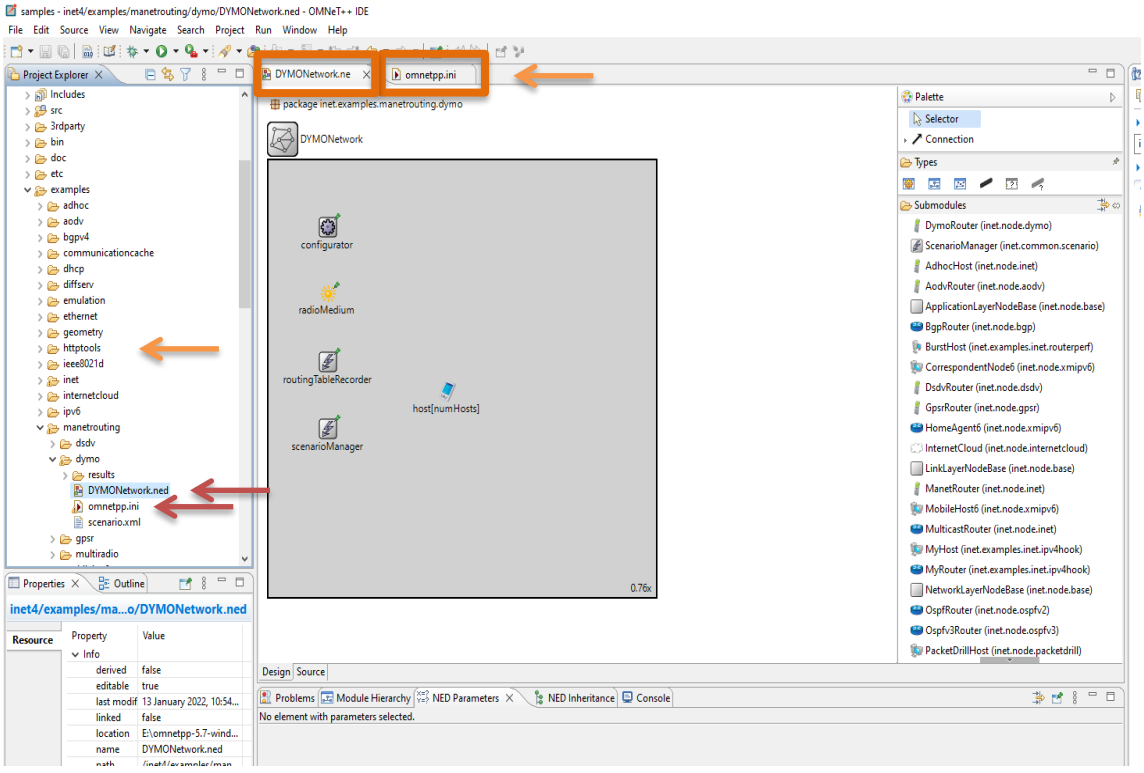
Step 1: Open the Omnet++ software and click on inet4 folder



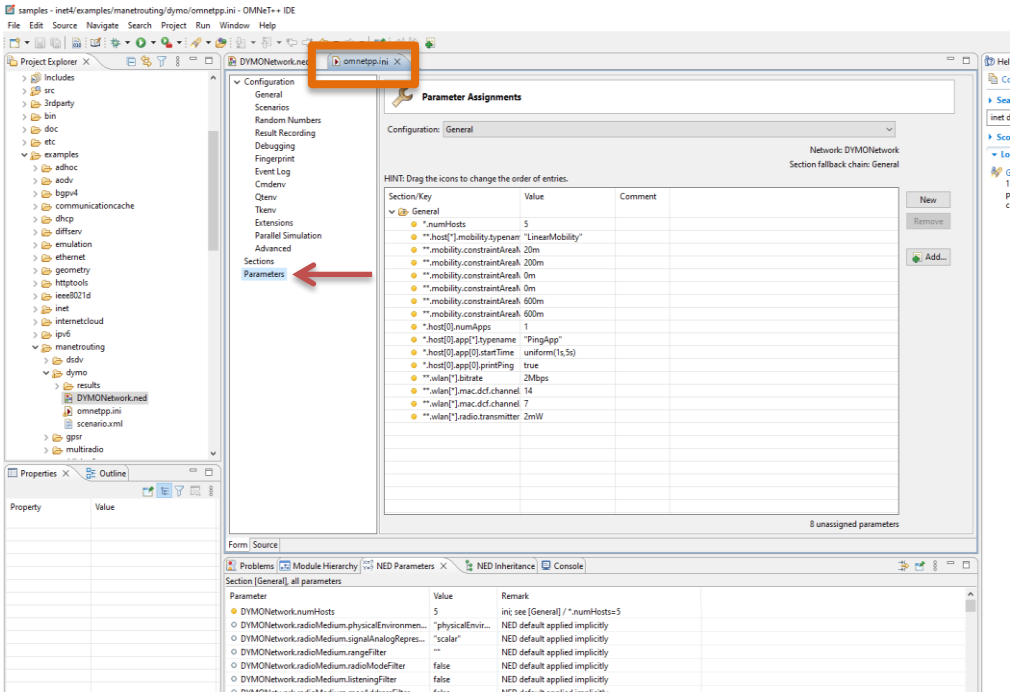
Step 2: Now select the examples folder and then in that folder select manetrouting folder



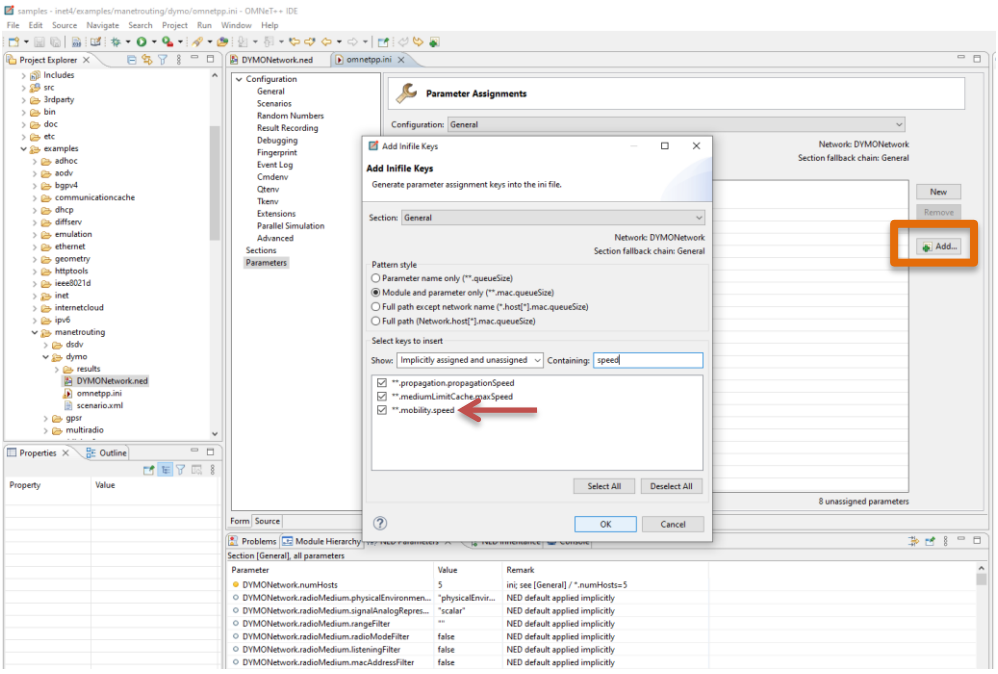
Step 3 : In manetrouting folder click dymo folder and then load the DYMONetwork.ned and omnetpp.ini files by double clicking



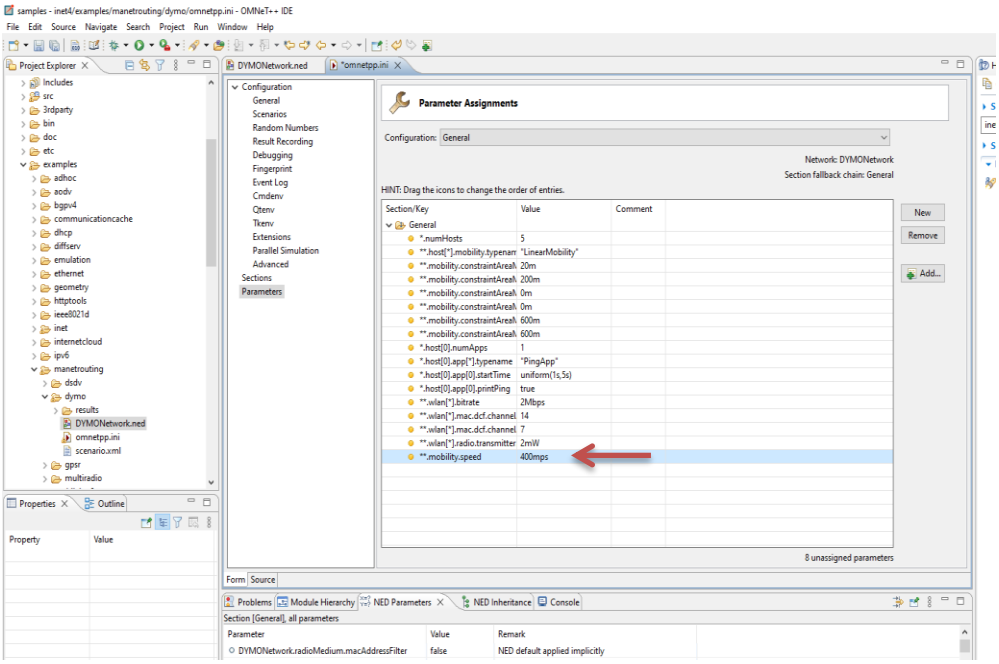
Step 4: Select omnetpp.ini file and click on parameters, we need to add mobility to the nodes



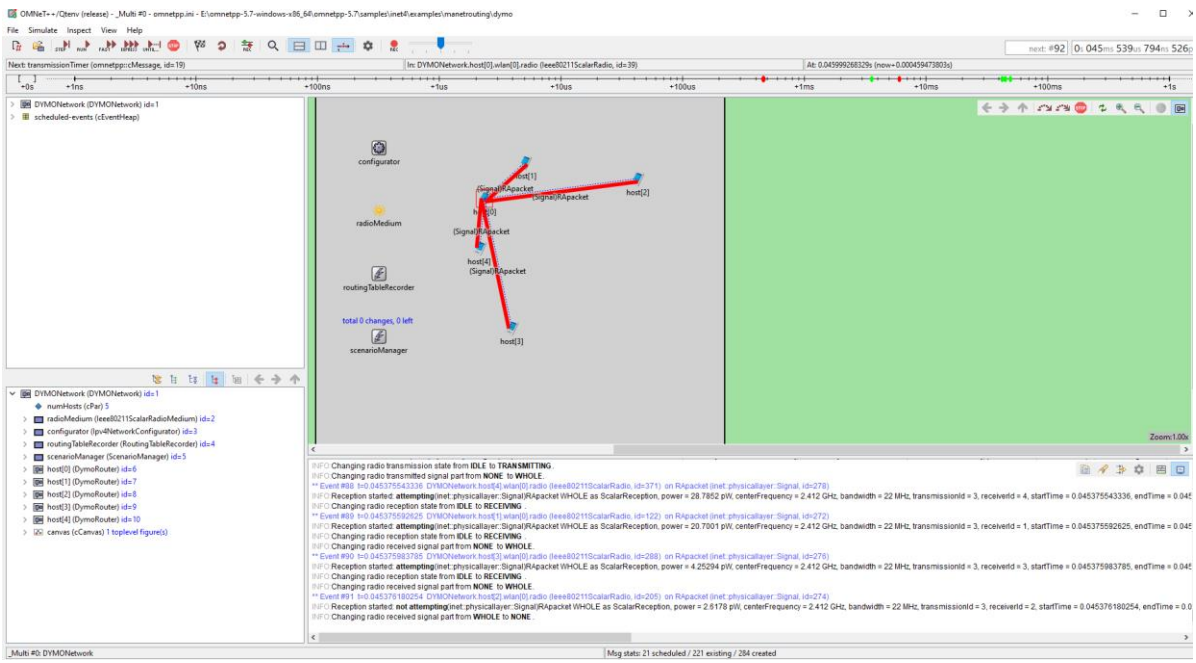
Step 5: For adding a new parameter click on add button and add the parameter **.mobility.speed



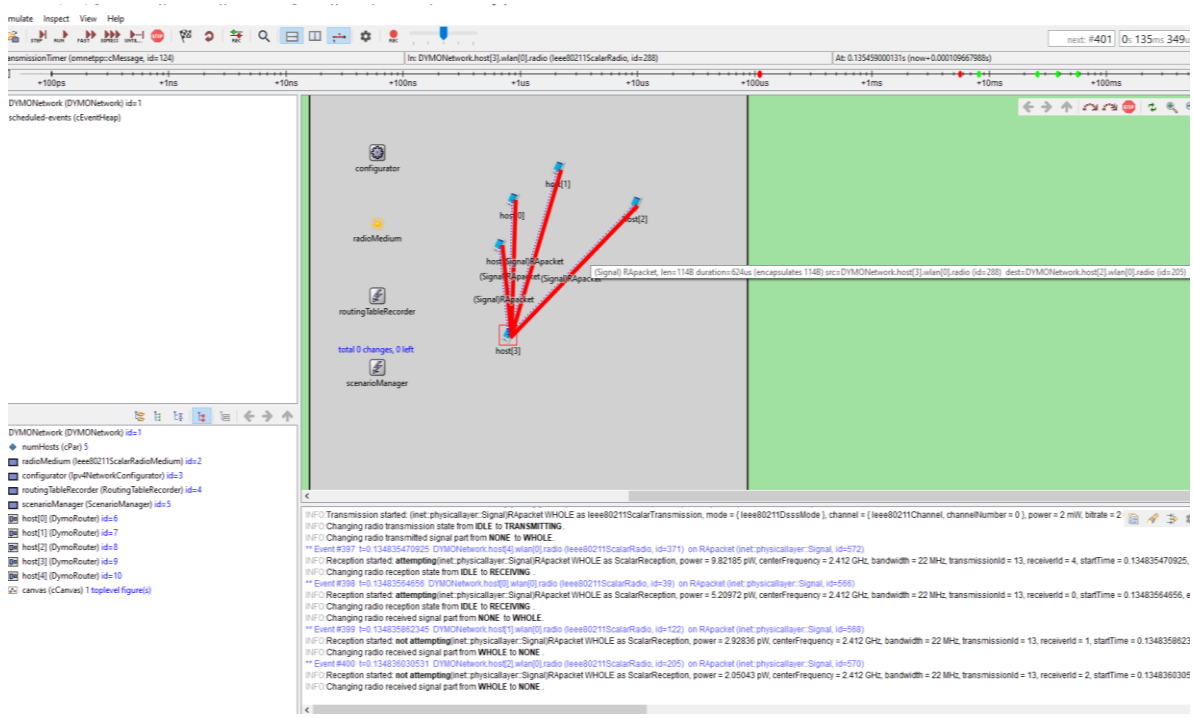
Step 6: Set the value for **.mobility.speed = 400mps



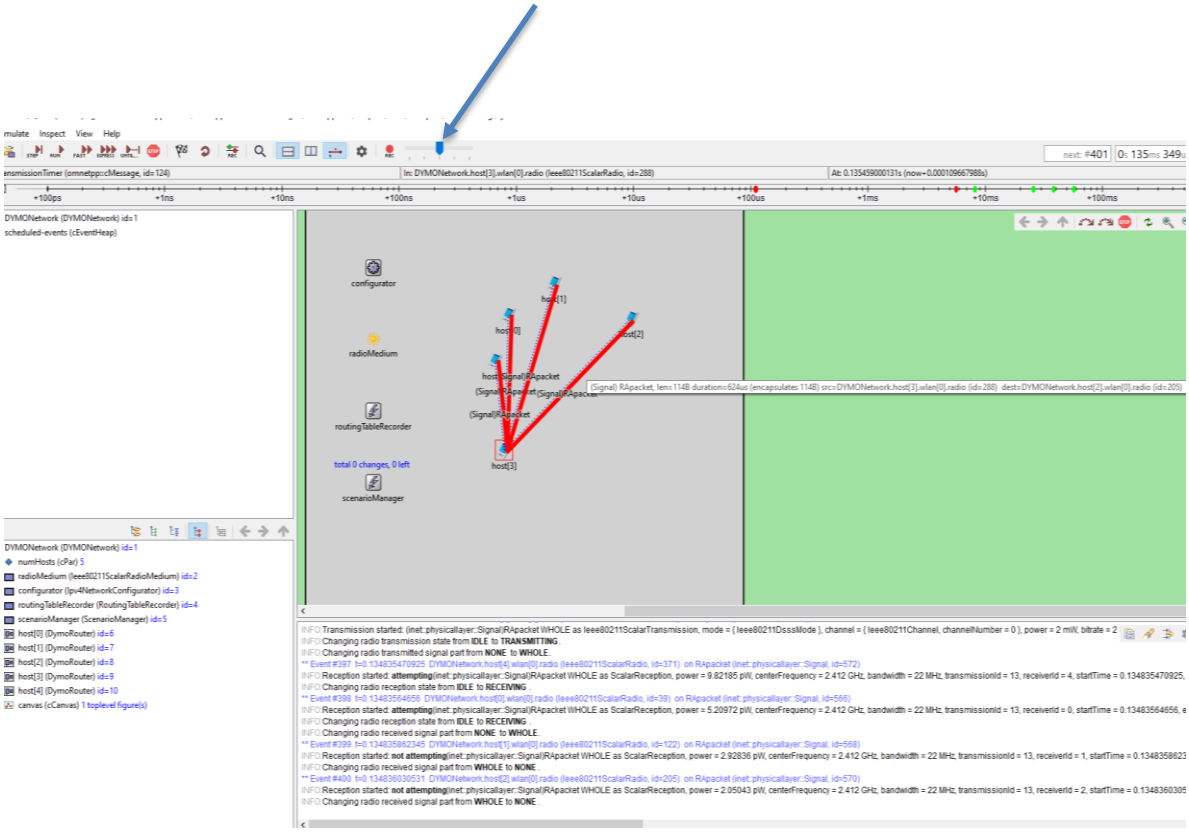
Step 7: Now we run the simulation with 5 mobile hosts forming MANET and get the following output



Since the nodes have mobility, after sometime their positions would change and we get



You can control the speed of simulation using that blue pin. It is shown using blue arrow below.



Hence the given MANET has been simulated with 5 hosts