Experiment 3

Wired and Wireless LANs
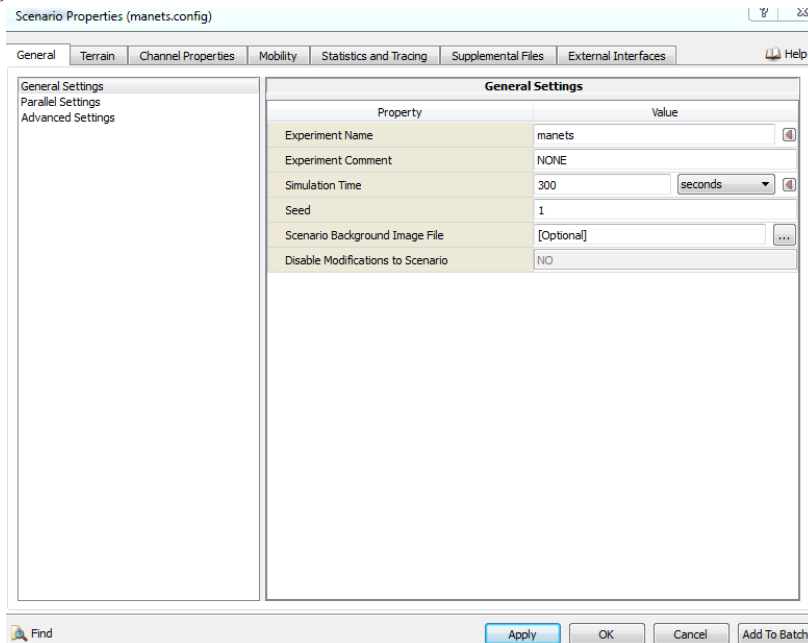
Objective:

A) To Simulate the Ad-hoc network with 30 nodes with multiple traffic. Repeat the simulation of the network by introducing mobility (MANETs) for the nodes and compare the performance of the networks.

B) To Simulate the Infrastructure Basic Service Set (IBSS) network with 30 nodes with multiple traffic and analyse the performance of the network.

Procedure:

A) Go to File → New → Save as→manets

Select Scenario Properties → General Settings → Give Experiment name, Simulation Time

Click Apply, Ok

Set the Terrain Properties

Step 1: Go to Tools → Node Placement

Select all the nodes, under **Network components** --> select "Wireless Network" place in canvas.
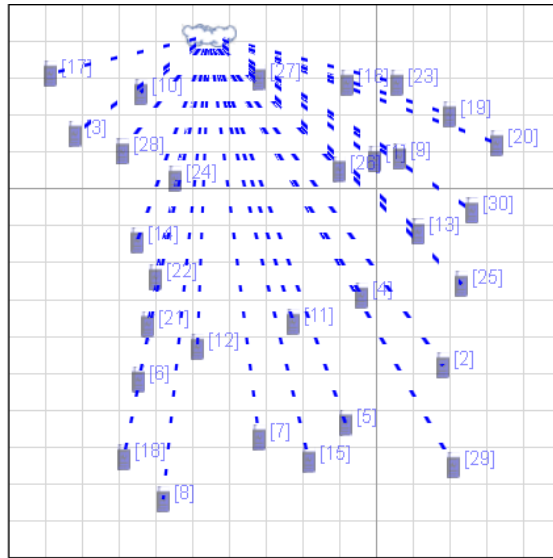
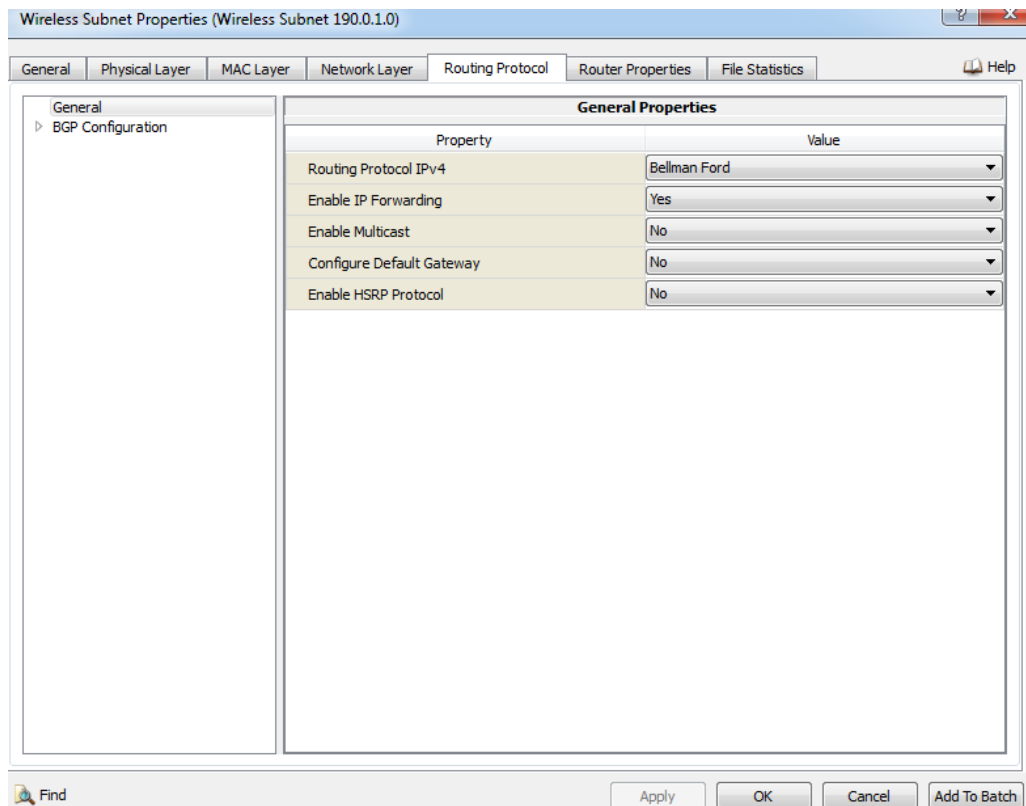**Step 2:** Create CBR Traffic between some pair of nodes.(under Applications → select CBR)
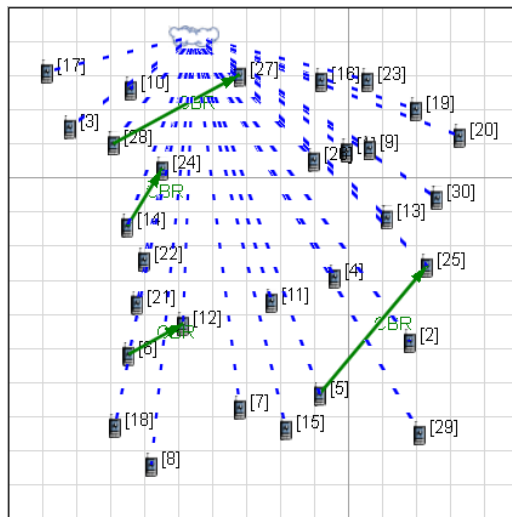
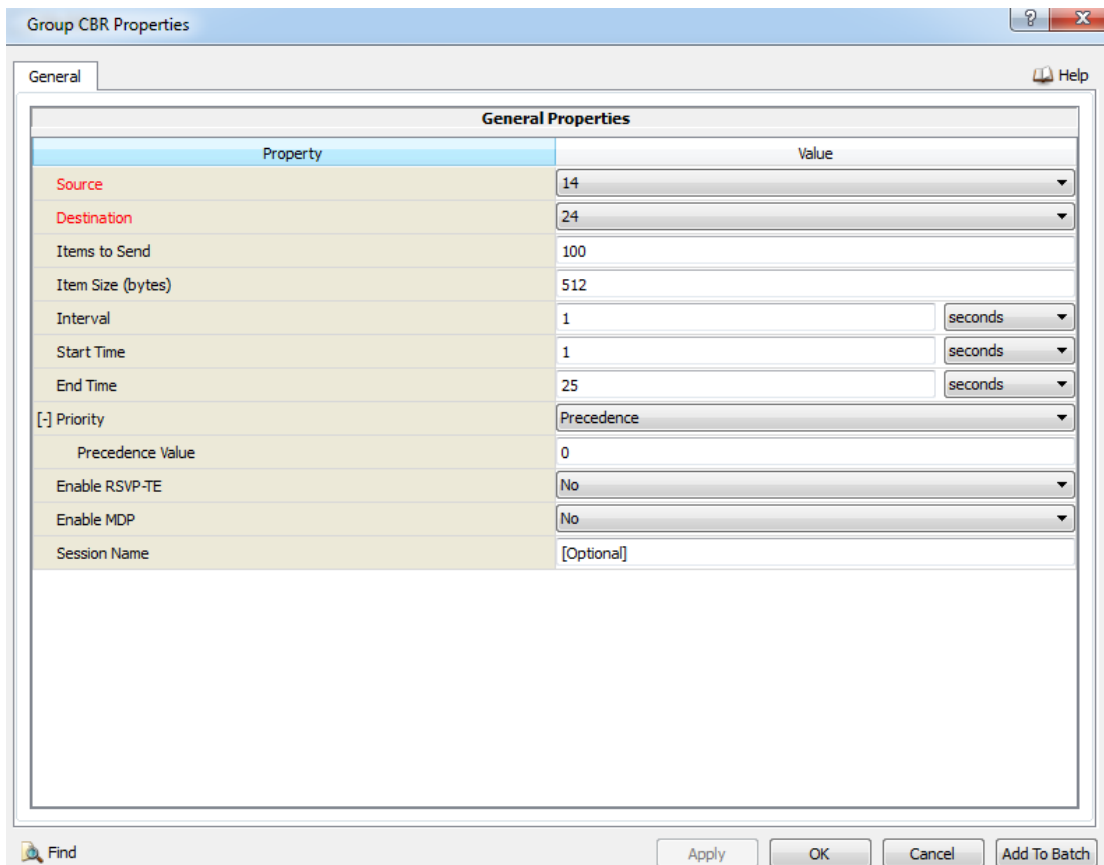**Step 3:** Go to Table view →Networks

Select Wireless subnet, right click, properties

Select the Routing Protocol as Bellman Ford

Step 4: Go to Table view → Applications
Select all the CBR sources, Right click, properties

Group CBR Properties	? X

General   📖 Help

General Properties

| Property	Value	
Source	14	▼
Destination	24	▼
Items to Send	100	
Item Size (bytes)	512	
Interval	1	seconds ▼
Start Time	1	seconds ▼
End Time	25	seconds ▼
[-] Priority	Precedence	▼
Precedence Value	0	
Enable RSVP-TE	No	▼
Enable MDP	No	▼
Session Name	[Optional]	

🔍 Find   Apply   OK   Cancel   Add To Batch

Step 5: Save the Scenario, Run Simulation, Play, Analyze Statistics of Current Scenario.

Observe "Total Unicast Messages sent".
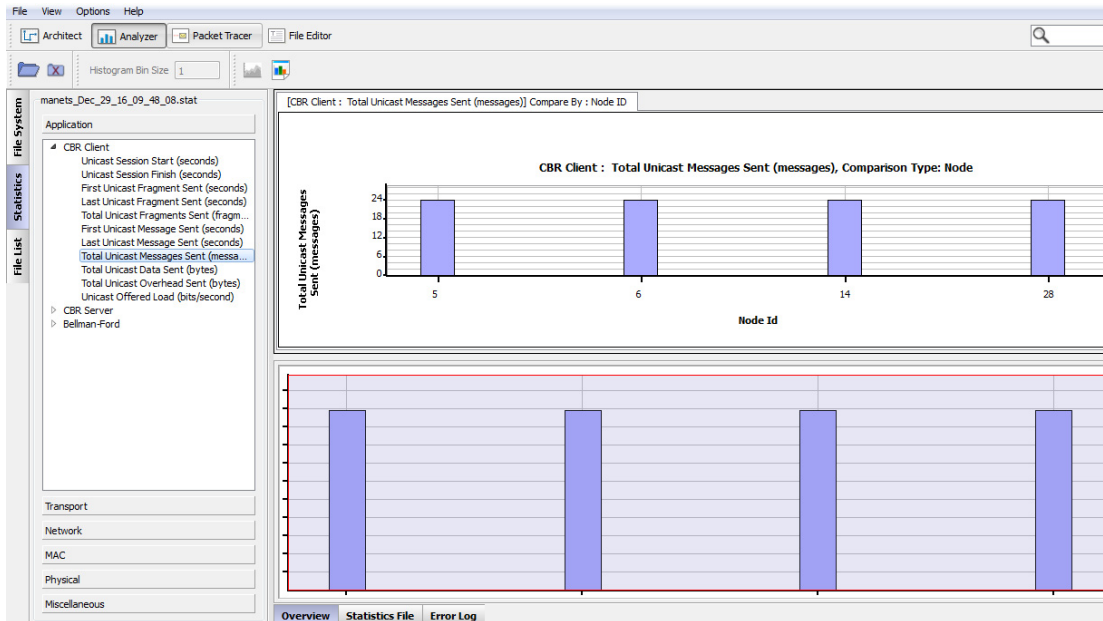
Similarly, observe "Total Unicast Messages Received", Throughput, End-to-End Delay, and Jitter.
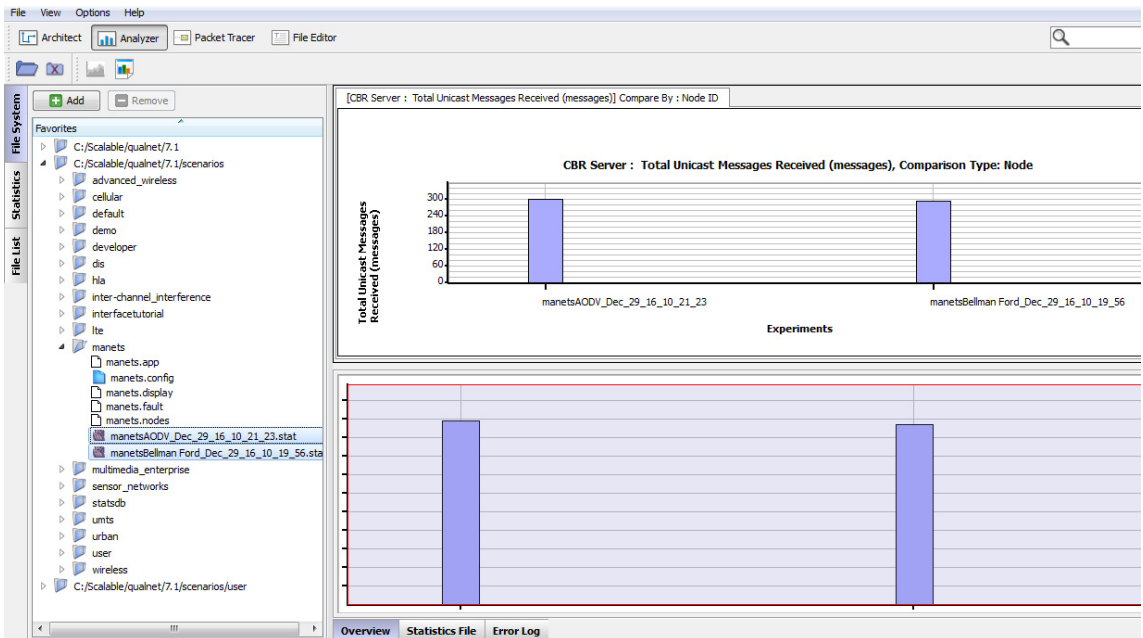
Step 6: Change the Routing Protocol to AODV and repeat the procedure.
Compare the statistics (Total Unicast Messages received, End-to-End Delay, Throughput, Jitter etc.)
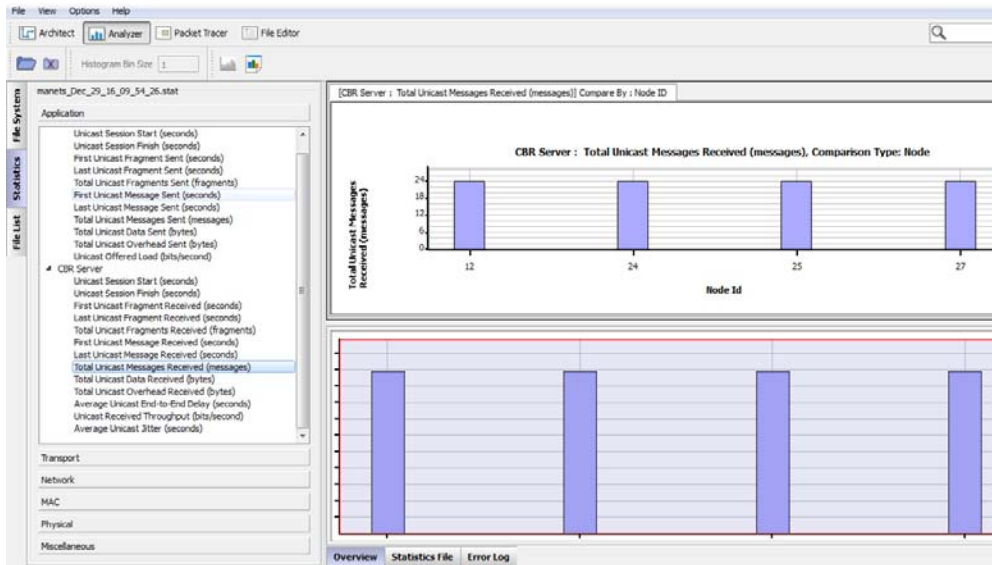

Step 7: We can also compare the performance of the AODV and Bellman Ford Protocols as follows:

Give the different experiment name (scenario Properties → General → Experiment name) for each Routing Protocol (Table view → Networks → Routing Protocol)

After Run Simulations

Go to File system, select the statistics files (.stat) in the Experiment name folder (path: qualnet/7.1/scenarios/user/manets) Right click, Analyze.
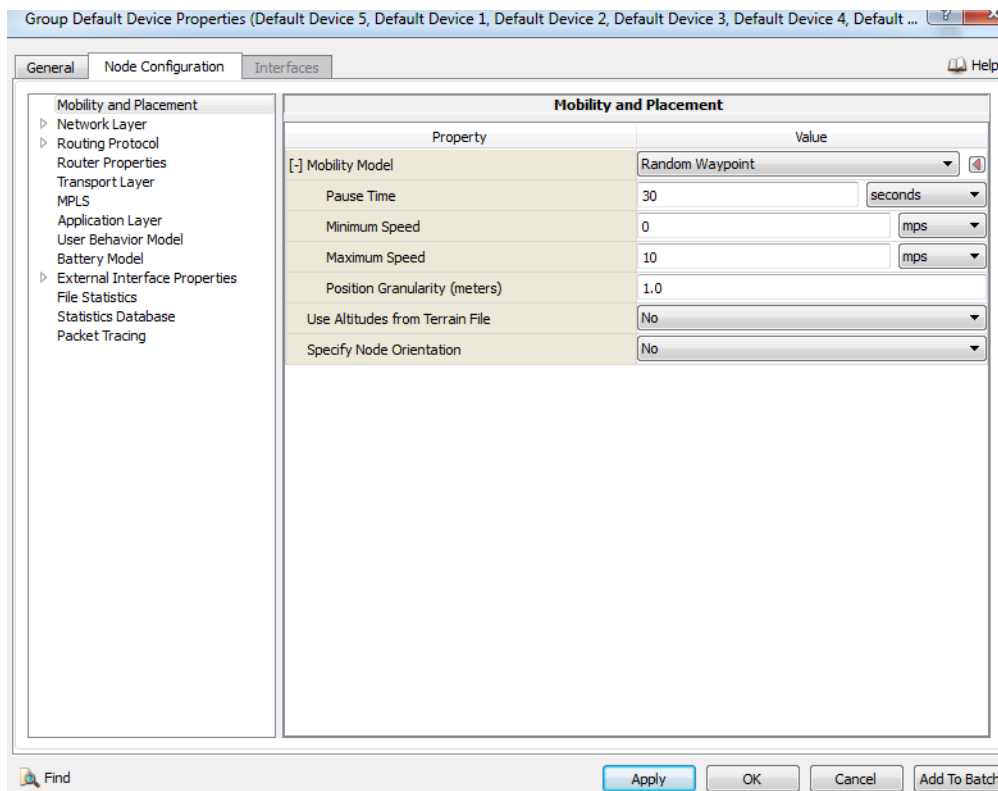

Go to Statistics; compare the End-to-End Delay, Throughput and Jitter.
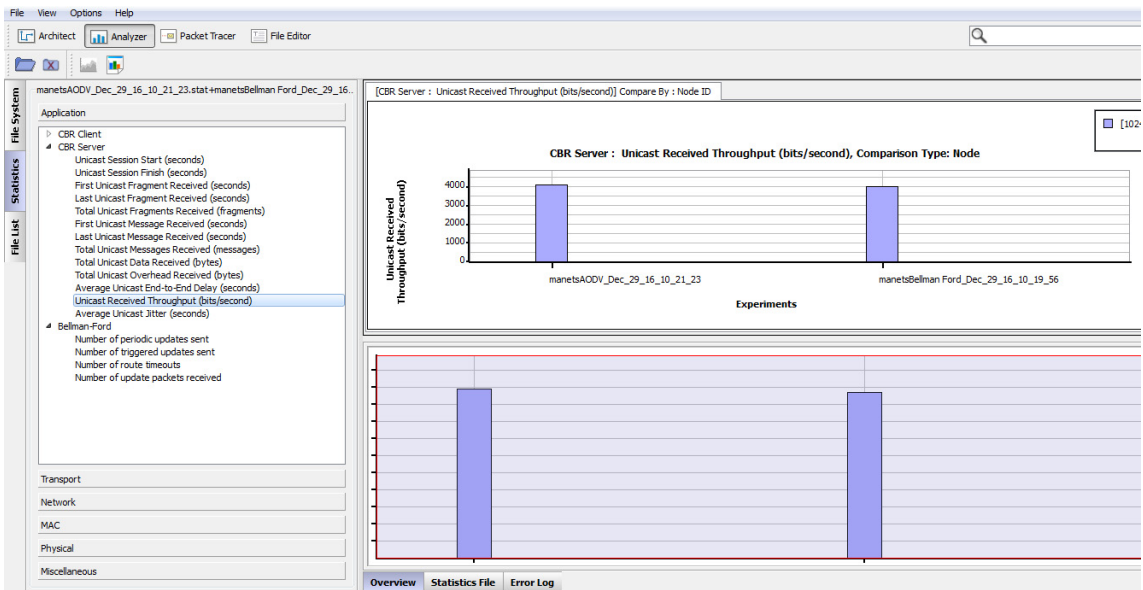
With Mobility (MANETs):

Step 8: In the same scenario, Go to Table view → Nodes →select all the nodes, right click, properties → Node Configuration → Mobility and Placement → Mobility Model → Random Waypoint
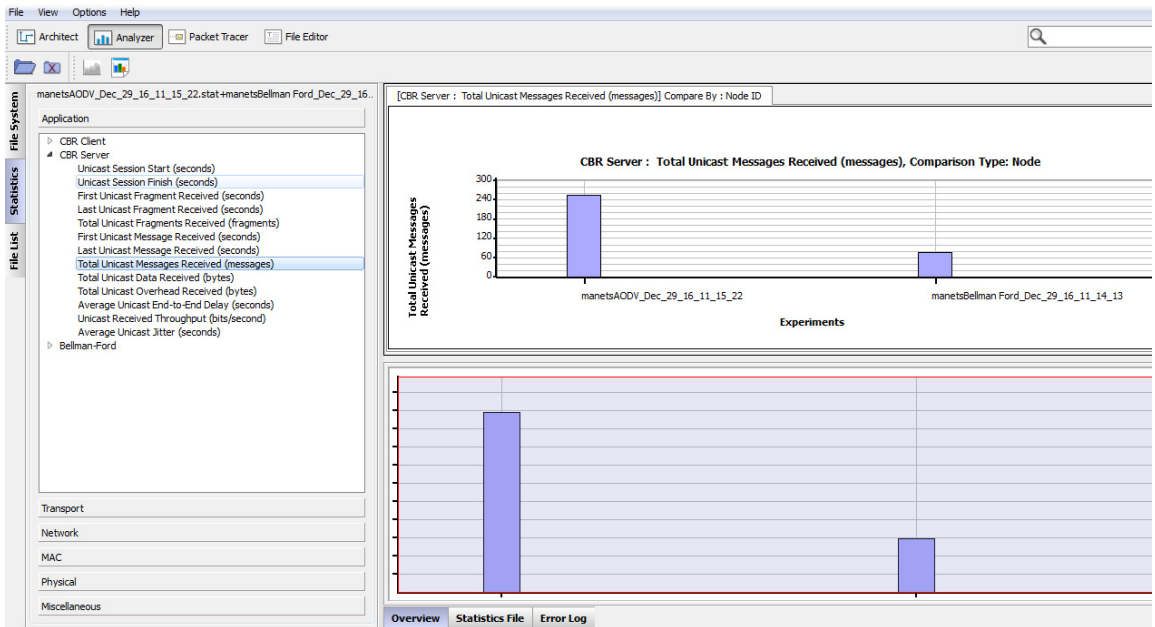

Step 9: Save the Scenario, Run Simulation, Play, Analyze Statistics of Current Scenario.

Repeat the procedure for AODV Routing Protocol. (Change the scenario name to "manetsAODV")

Step 10: Go to File system → select the both the statistics files (.stat), right click Analyze.

Go to Statistics, compare the Total Unicast messages received, End-to-End Delay, Throughput, Jitter etc.

B) **Procedure:**

Create a folder with your registration number under "C://qualnet/7.4/scenarios/user/"

    Go to File→new→save as→wifiaccesspoint

Go to Scenario Properties→General Settings → Give Experiment name, Simulation Time: 300 Seconds

Terrain → scenario Dimensions →1000 x 1000 meters

Step 1: Go to Tools → Node placement → Number of nodes → 30 Click Apply, Ok Select all the nodes, under Network Components→ select Wireless Network, and drag on to canvas.
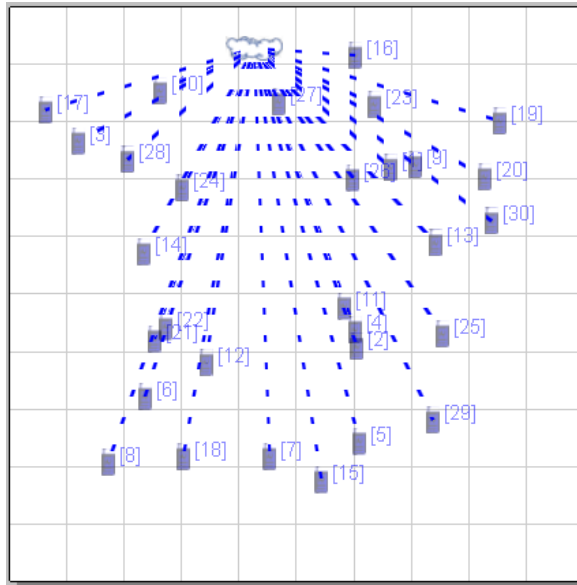
Step 2: Go to Table view → Networks, right click, properties → MAC Layer → Station Association Type→ Dynamic Station Scan Type → Active
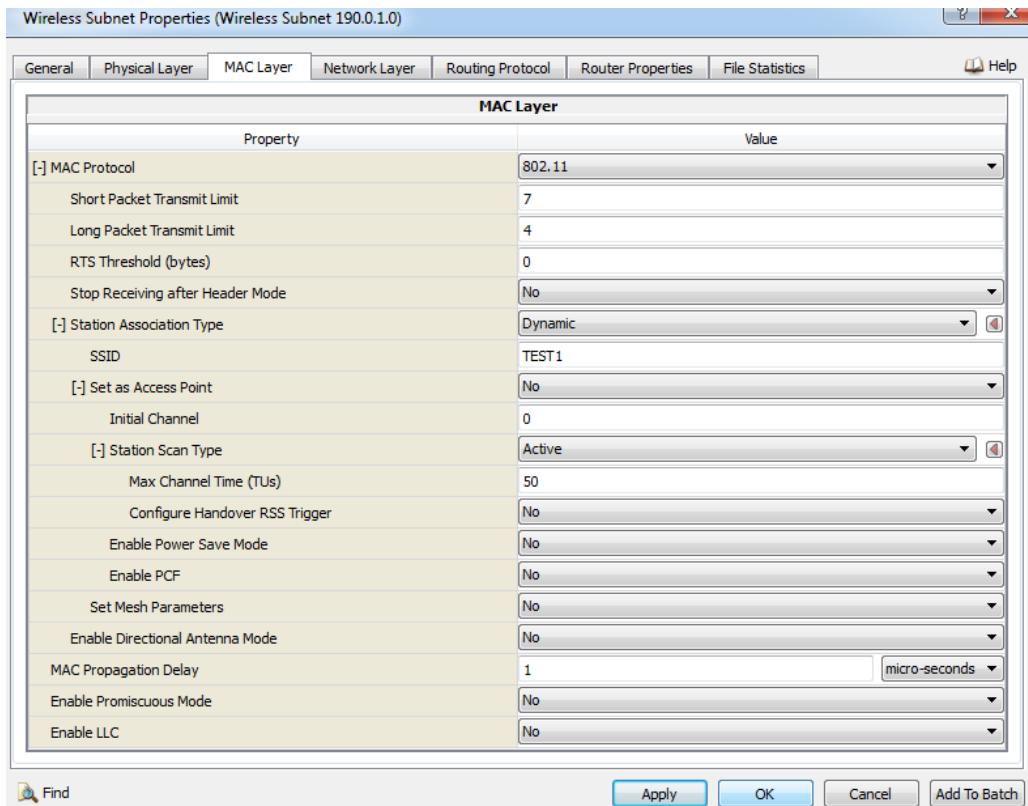
Step 3: To set Access point:

Select one of the nodes (which you want to set as access point) in the canvas, right click, properties, interfaces, MAC Layer → Set as Access point → YES

Step 4: Create CBR Traffic between few pairs of nodes.
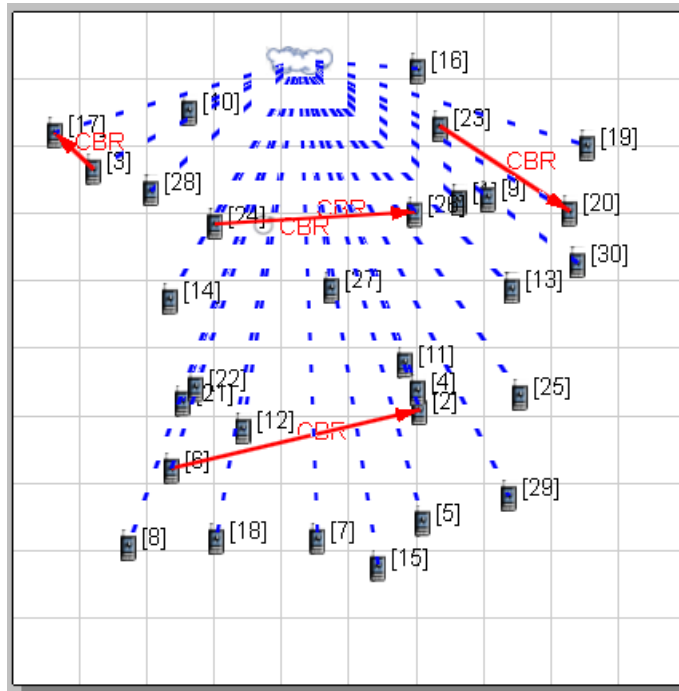
Step 5: Save the scenario, Run Simulation, Play and Analyze Statistics of Current Scenario.
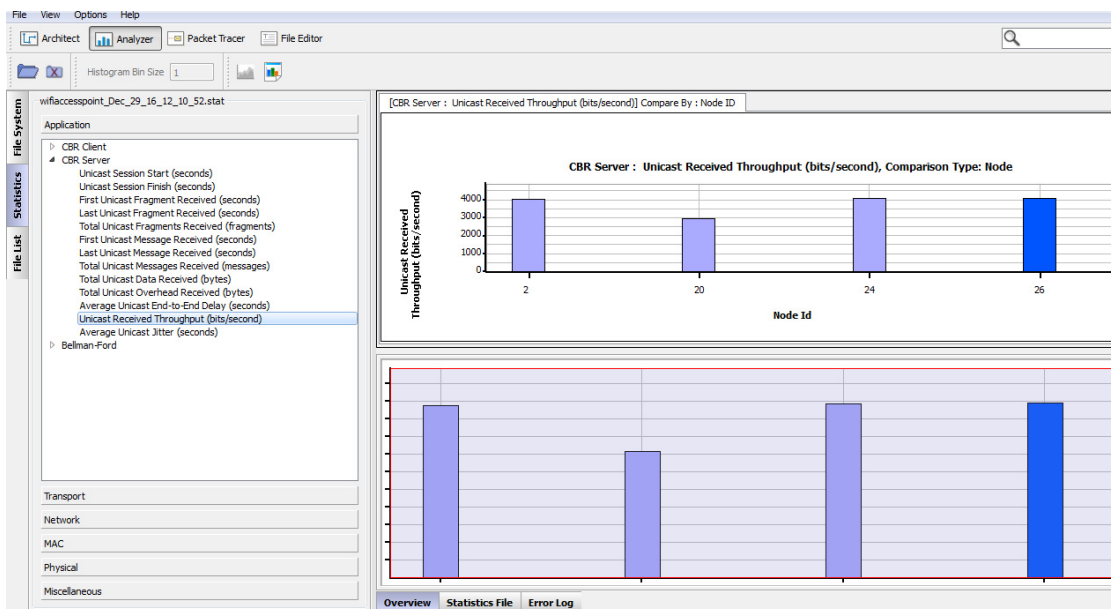
Step 6: For creating Mobility for the Nodes:

Go to Table View → Nodes → Select all the nodes, right click, properties → Node Configuration → Mobility and Placement → Mobility Model → Random Way Point

Step 7: Save the Scenario, Run Simulation, Play, Analyze Statistics of Current Scenario Observe the "Total Unicast Messages Sent" at Client.
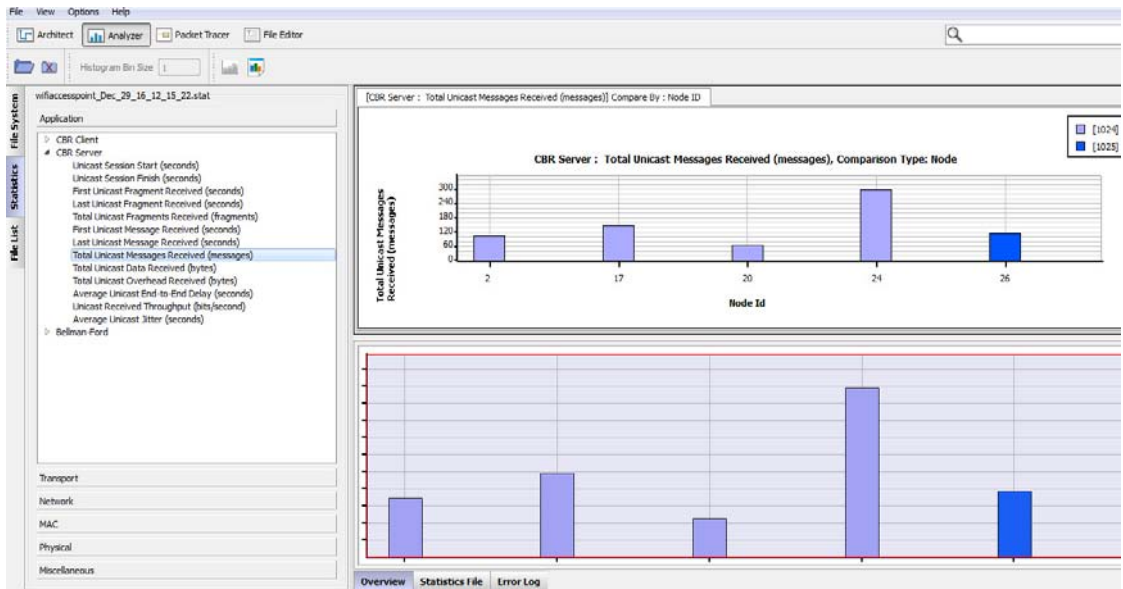
Similarly, observe "Total Unicast Messages Received", Throughput, End-to-End Delay, and Jitter.

Exercise 1: Simulate CSMA/CA network and analyse the performance over CSMA network.