

## **Submission Deadline: January 30, 2023, Monday, 11:59 PM**

### **Personalised Parameters:**

See [this Google Sheet](#) to know your parameters.

### **Wireless MAC Type:**

- Wireless 802.15.4
- Wireless 802.11

### **Routing Protocol:**

- DSDV
- AODV
- DSR

### **Agent + Application:**

- UDP + Exponential Traffic
- UDP + CBR Traffic
- TCP Reno + FTP
- TCP Tahoe + Telnet,

### **Node Positioning:**

- Random (Randomly place nodes anywhere with area)
- Grid (Place nodes in a grid. You can choose the number of rows and columns yourself)

### **Flow:**

- Random Source Destination (For each flow, choose a random source and a destination. Careful not to choose same node as source and destination)
- 1 Source, Random Sink (except source itself) (Choose a random source X, then for each flow choose X as source, and any other node as destination)
- 1 Sink, Random Source (Choose a random sink X, then for each flow choose X as destination, and any other node as source)

**Parameters:**

Queue: Droptail, max size 50 (*Using Queue/DropTail/PriQueue with DSR may cause segmentation fault. In that case you can use CMUPriQueue instead.*)

Antenna: Omni Directional

Speed of nodes: Uniform random between 1m/s and 5m/s for each node.

Propagation Model: Two Ray Ground Propagation Model

With your personalised parameters and global parameters fixed, vary the parameters below.

**Baseline Parameters:** (while varying one parameter, keep other parameters fixed like below)

- Area Size: 500m x 500m
- Number of Nodes: 40
- Number of flows: 20

**Vary parameters:**

- Area Size: 250m x 250m, 500m x 500m, 750m x 750m, 1000m x 1000m, 1250m x 1250m
- Number of Nodes: 20, 40, 60, 80, 100
- Number of flows: 10, 20, 30, 40, 50

**Metrics:**

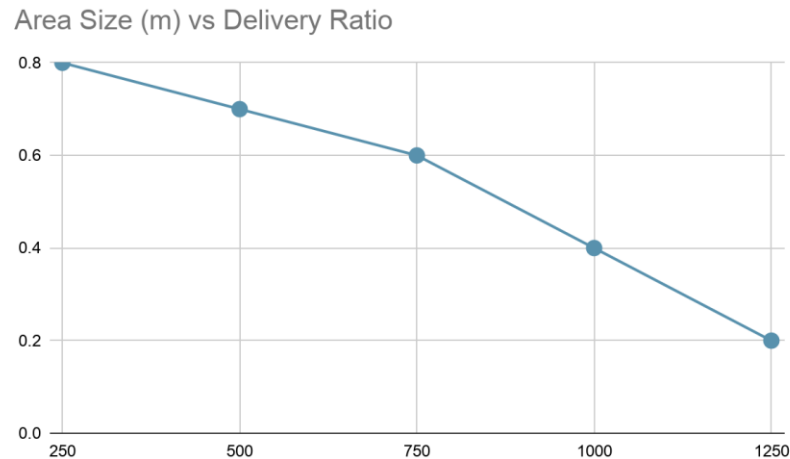
For each of the varying parameters, plot 4 graph showing,

- Network throughput
- End-to-end delay
- Packet delivery ratio (total # of packets delivered to end destination / total # of packets sent)
- Packet drop ratio (total # of packets dropped / total # of packets sent)

**For example:**

Say, for varying area sizes, keep other params fixed as mentioned in baseline. Find 4 metrics for each of the values of area size. Plot each metric in a separate graph. You will get 4 graphs for varying area size. One of them is the Delivery ratio. It may look like this.

**Clearly mention the x-axis, y-axis, x-ticks and y-ticks.**



The total number of graphs will be  $3 \times 4 = 12$ .

**Report:**

- Write short descriptions of your MAC type, Routing protocol, Agent Type, Application.
- Include all the 12 graphs.
- Write short observations on the results you got.

**Submission:**

- Code (exclude the trace files, nam files). Include only the source files (.tcl, .sh, .awk, .py, .ipynb or others)
- Report as pdf.
- Put all of these in a zip file
- Name it as your student id (1805xxx.zip)
- Submit

**Marks Distribution:**

Basic Simulation and configs	4
Vary area size + graph	4
Vary number of nodes + graph	4
Vary number of flows + graph	4
Report	4
<b>Total</b>	<b>20</b>

## Appendix A: List of graphs

Graph No.	x-axis	y-axis	Fixed Param Values		
			Area-size	Number of nodes	Number of flows
1	Area Size <ul style="list-style-type: none"> <li>250m x 250m</li> <li>500m x 500m</li> <li>750m x 750m</li> <li>1000m x 1000m</li> <li>1250m x 1250m</li> </ul>	Network throughput	-	40	20
2		End-to-end Delay	-	40	20
3		Packet delivery ratio	-	40	20
4		Packet drop ratio	-	40	20
5	Number of nodes <ul style="list-style-type: none"> <li>20</li> <li>40</li> <li>60</li> <li>80</li> <li>100</li> </ul>	Network throughput	500m x 500m	-	20
6		End-to-end Delay	500m x 500m	-	20
7		Packet delivery ratio	500m x 500m	-	20
8		Packet drop ratio	500m x 500m	-	20
9	Number of flows <ul style="list-style-type: none"> <li>10</li> <li>20</li> <li>30</li> <li>40</li> <li>50</li> </ul>	Network throughput	500m x 500m	40	-
10		End-to-end Delay	500m x 500m	40	-
11		Packet delivery ratio	500m x 500m	40	-
12		Packet drop ratio	500m x 500m	40	-