

# A Report on NS2 Offline

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## 1 Overview

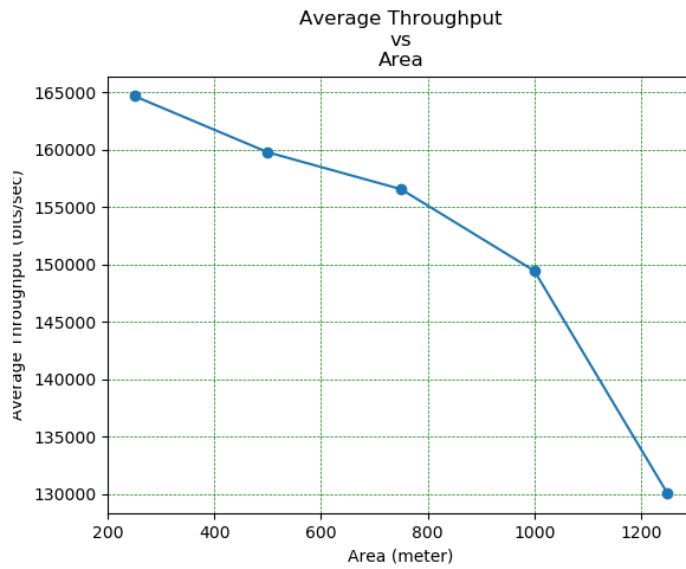
In this assignment, we have implemented a wireless network scheme using NS2 simulator. We have varied the area size, number of nodes and number of flows, and observed how average throughput, average delay, delivery ratio and drop ratio change accordingly.

## 2 Assigned Parameters

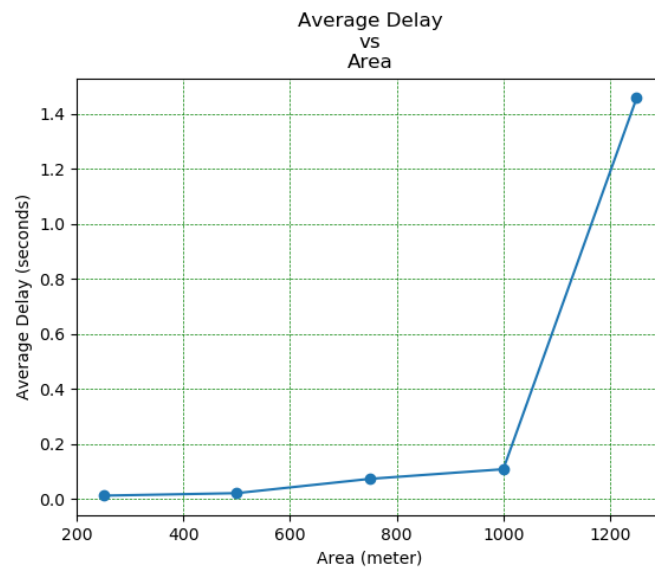
- **Wireless MAC Type:** Wireless 802.15.4  
However, 802.11 has be used for simulation to avoid negative throughput. As we notice from the trace file, in case of TCP agent and MAC 802.15.4, the sent packet size is 16 bytes. Again, the header size is 20 bytes. Therefor, at the time of throughput calculation, the result of subtraction becomes negative.
- **Routing Protocol:** DSR
- **Agent + Application:** TCP Tahoe + Telnet
- **Node Positioning:** Grid
- **Flow:** Random Source Destination
- **Queue Type:** CMUPriQueue  
While using queue type Queue/DropTail/PriQueue with DSR routing protocol, segmentation fault was noticed to occur. Therefore, CMUPriQueue is used as queue type to avoid segmentation fault.
- **Antenna:** Omni Directional
- **Speed of Nodes:** Uniform random between 1m/s and 5m/s for each node.
- **Propagation Model:** Two Ray Ground Propagation Model

### 3 Graphs

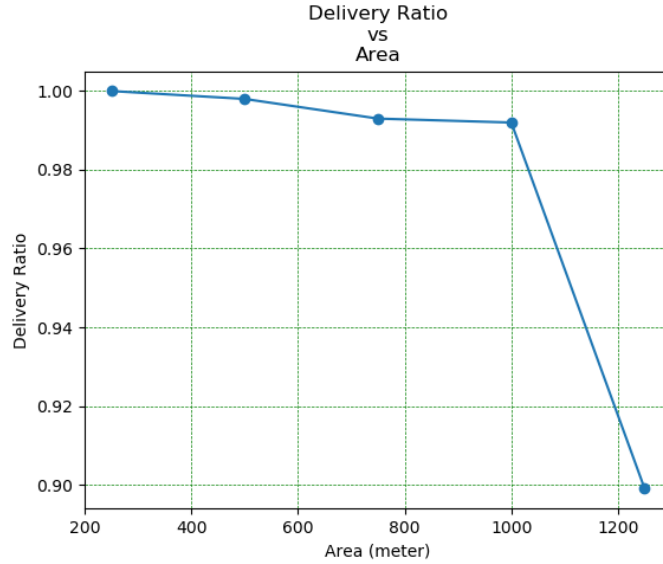
#### 3.1 Average Throughput vs Area Size



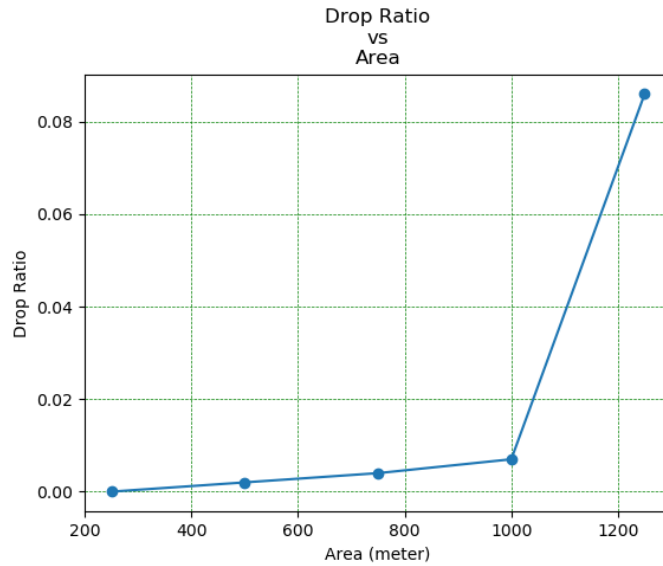
#### 3.2 Average Delay vs Area Size



### 3.3 Delivery Ratio vs Area Size

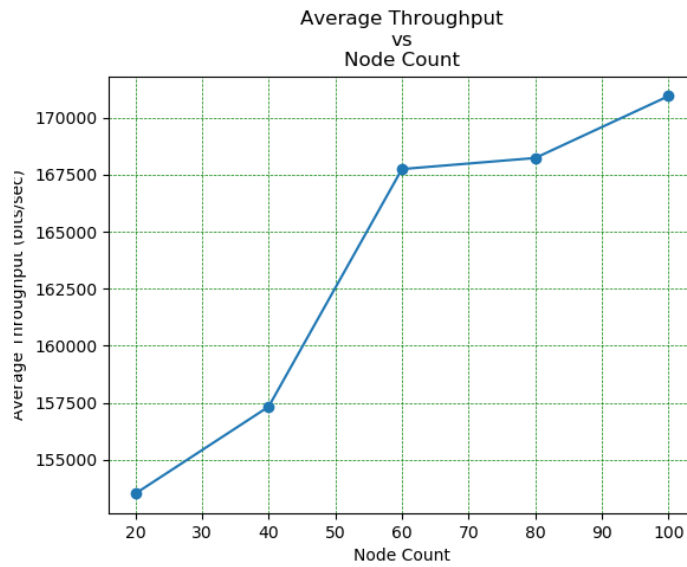


### 3.4 Drop Ratio vs Area Size

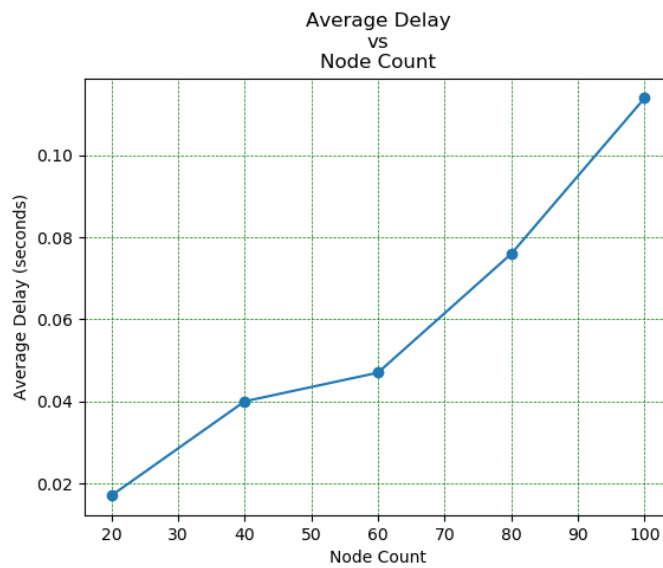


**Observation:** If we increase the area size, the average throughput increases, delay for transmitting packets increases, delivery ratio decreases and finally, drop ratio increases. Node count and flow count have been kept 40 and 20, respectively while varying the area size.

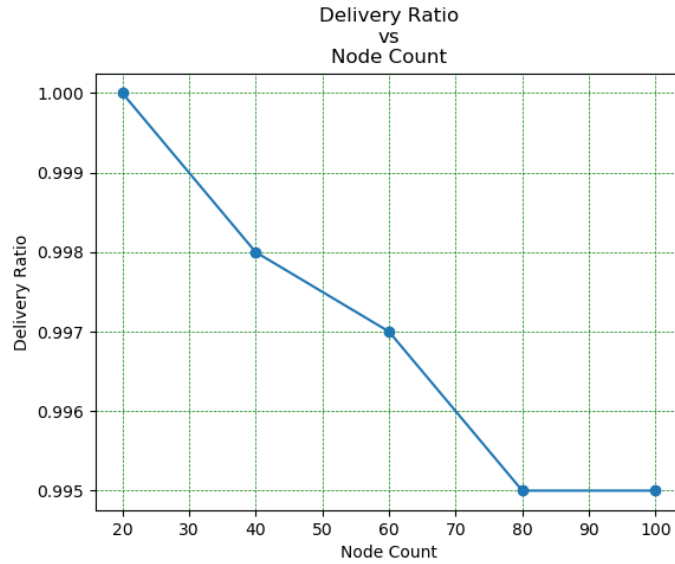
### 3.5 Average Throughput vs Node Count



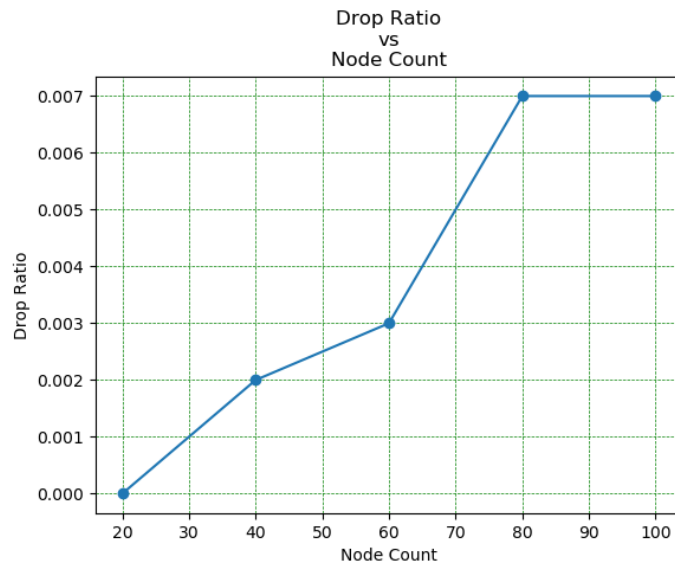
### 3.6 Average Delay vs Node Count



### 3.7 Delivery Ratio vs Node Count

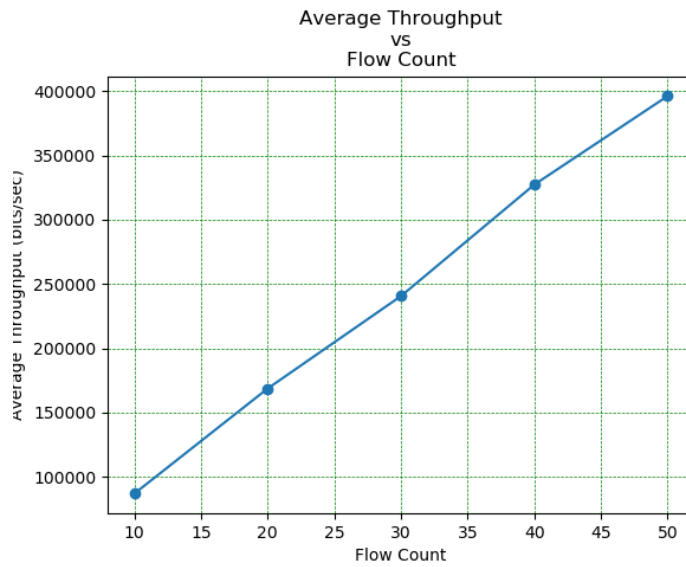


### 3.8 Drop Ratio vs Node Count

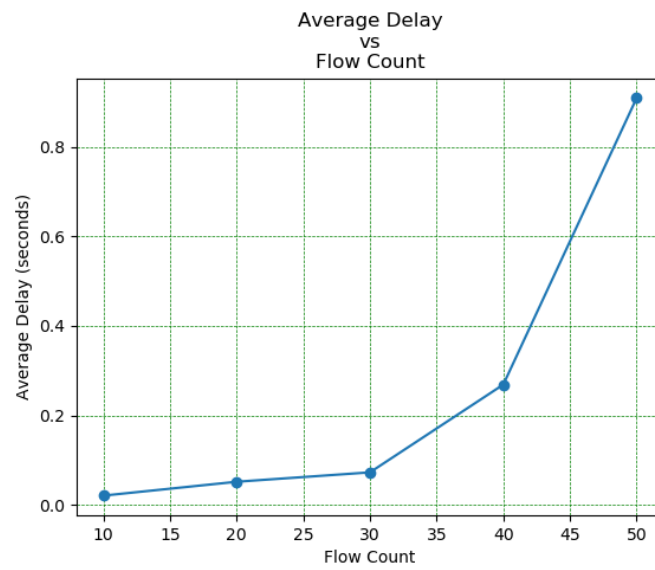


**Observation:** If we increase the number of nodes, the average throughput increases, delay for transmitting packets increases, delivery ratio decreases and finally, drop ratio increases. Area size and flow count have been kept 500m X 500m and 20, respectively while varying the number of nodes.

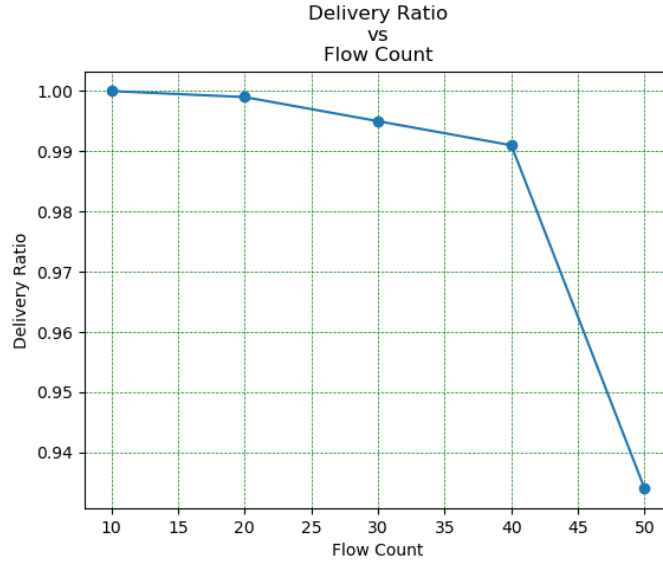
### 3.9 Average Throughput vs Flow Count



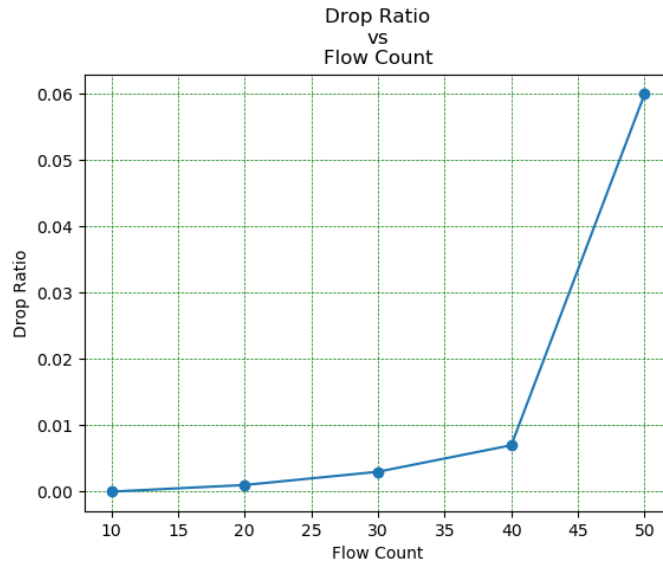
### 3.10 Average Delay vs Flow Count



### 3.11 Delivery Ratio vs Flow Count



### 3.12 Drop Ratio vs Flow Count



**Observation:** If we increase the number of nodes, the average throughput increases, delay for transmitting packets increases almost exponentially, delivery ratio decreases and drop ratio increases. Area size and node count have been kept 500m X 500m and 40, respectively while varying the number of flows.