CSE 322
Offline NS2 Report

Md. Tamimul Ehsan

1805022

Wireless MAC: 802.11

The provided task was 802.15.4. But this with AODV was generating negative throughput. So according to instruction it was changed to 802.11.

IEEE 802.11 standard, popularly known as WiFi, lays down the architecture and specifications of wireless LANs (WLANs). WiFi or WLAN uses high frequency radio waves instead of cables for connecting the devices in LAN. Users connected by WLANs can move around within the area of network coverage.

The 802.11 MAC sublayer provides an abstraction of the physical layer to the logical link control sublayer and upper layers of the OSI network. It is responsible for encapsulating frames and describing frame formats

Routing Protocol: AODV

AODV (Ad-hoc On-demand Distance Vector) is a routing protocol for mobile ad-hoc networks (MANETs). It is a reactive routing protocol, meaning that it only establishes routes as needed, rather than maintaining routes at all times.

When a node in a network wants to send data to a destination, it first checks if it has a route to that destination. If there is no route, the node broadcast a route request (RREQ) message to its neighbours. The RREQ message is forwarded through the network until it reaches a node that knows the route to the destination.

The node that knows the route then sends a route reply (RREP) message back to the source node along the reverse path of the RREQ message. The source node then updates its routing table with the new route to the destination

Agent Layer: TCP Tahoe

TCP Tahoe is a congestion control algorithm used by Transmission Control Protocol (TCP) to manage network congestion. It is named after Lake Tahoe, California, where it was first developed.

TCP Tahoe operates on the principle of detecting congestion by observing the number of unacknowledged packets (also known as "segments"). If the number of unacknowledged packets exceeds a certain threshold, TCP Tahoe assumes that the network is congested and reduces the sending rate by cutting its congestion window in half. This process is known as slow start.

Once the congestion window is reduced, TCP Tahoe waits for the network to recover before gradually increasing its sending rate again. This is done to prevent further congestion and avoid the global synchronization of flows that can result in inefficient use of network resources

Application Layer: Telnet

Telnet is a network protocol used to remotely access and manage network devices such as servers, routers, and switches. It allows users to connect to a remote device, log in with a username and password, and access a command-line interface (CLI) to execute commands and configure the device.

Telnet operates on the Application layer of the OSI model and uses the Transmission Control Protocol (TCP) to establish a virtual terminal session between the client and server. This allows users to remotely access the command-line interface of a network device as if they were physically connected to it.

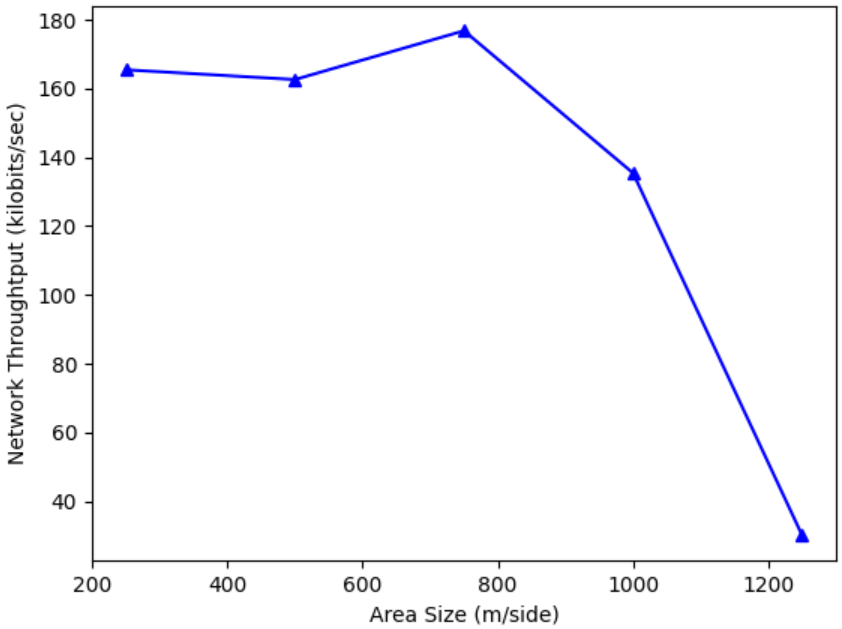
Node Positioning: Random

Flow: 1 sink, random source

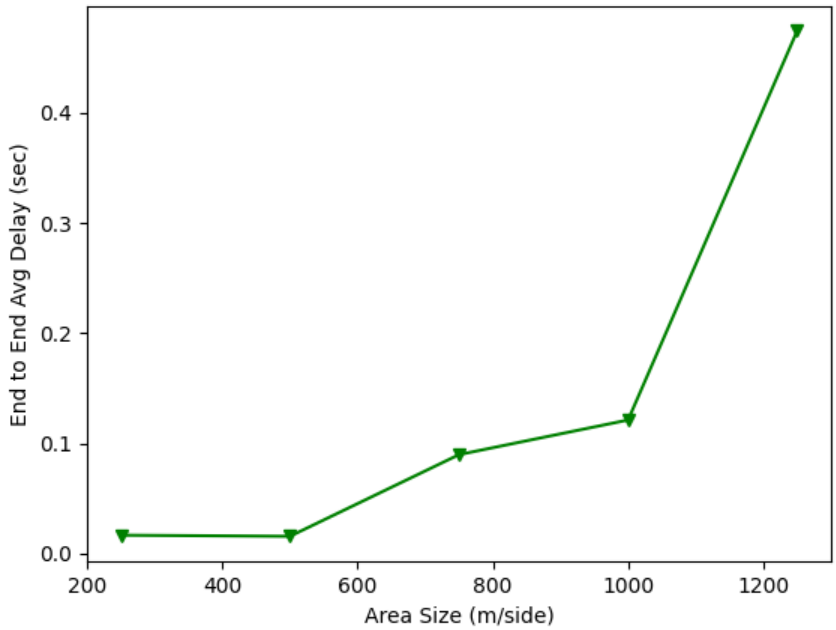
Graphs:

Varying Area:

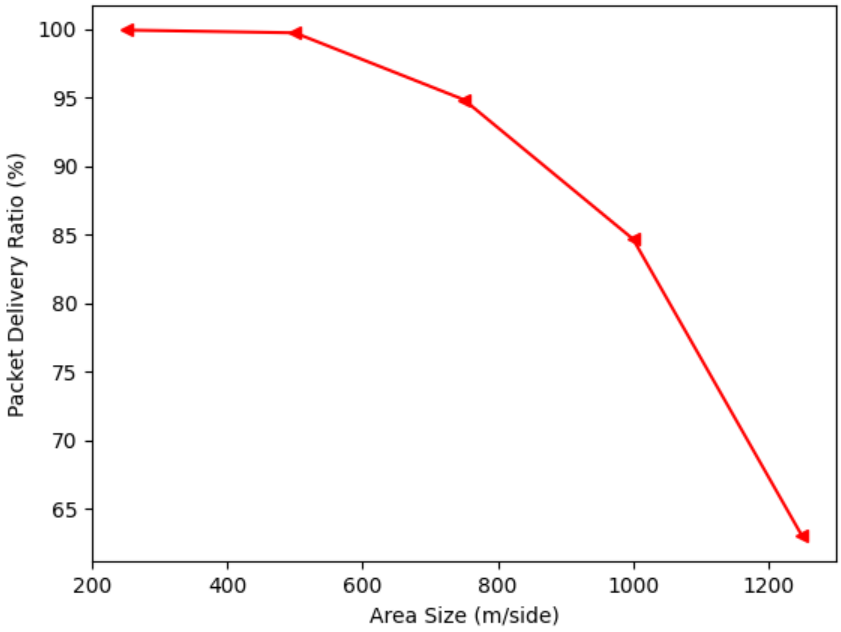
Average Throughput



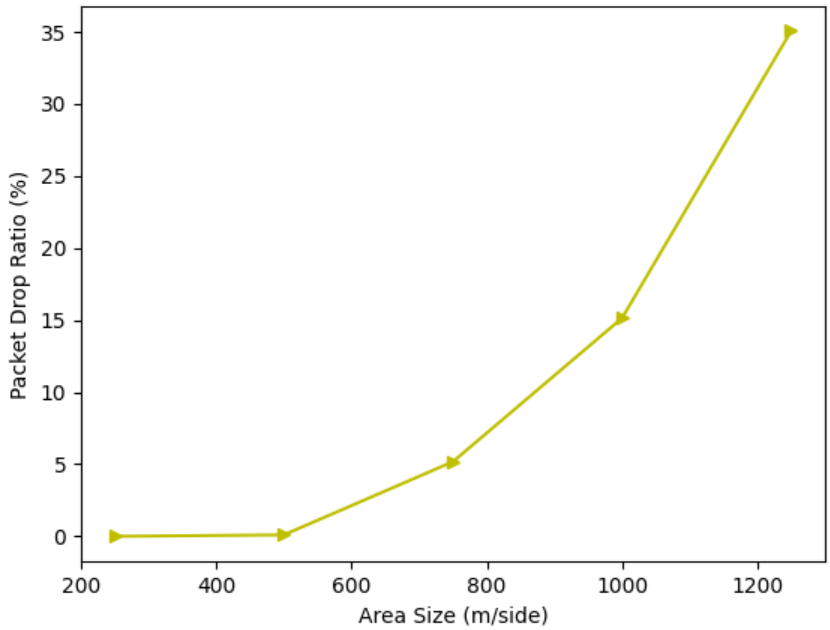
End-to-end Delay



Packet Delivery Ratio

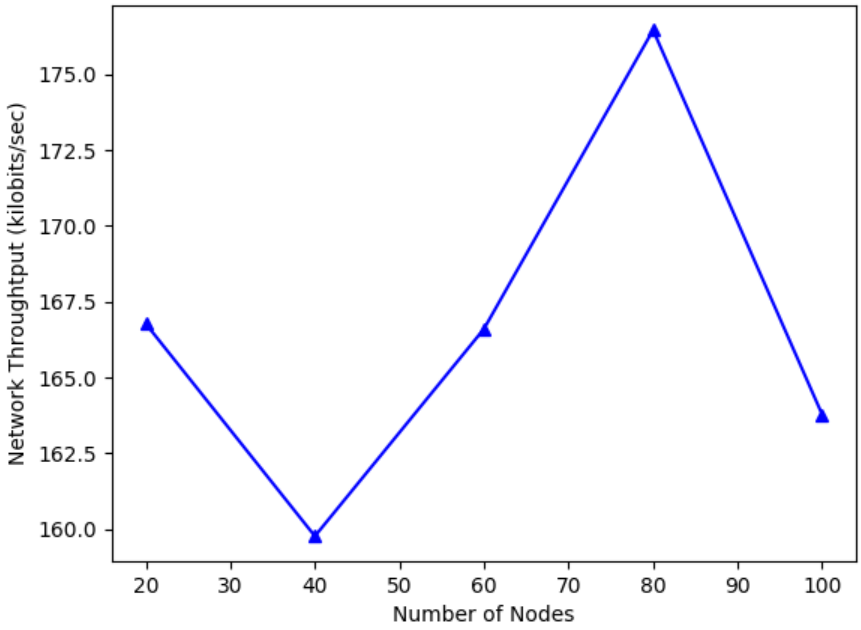


Packet Drop Ratio

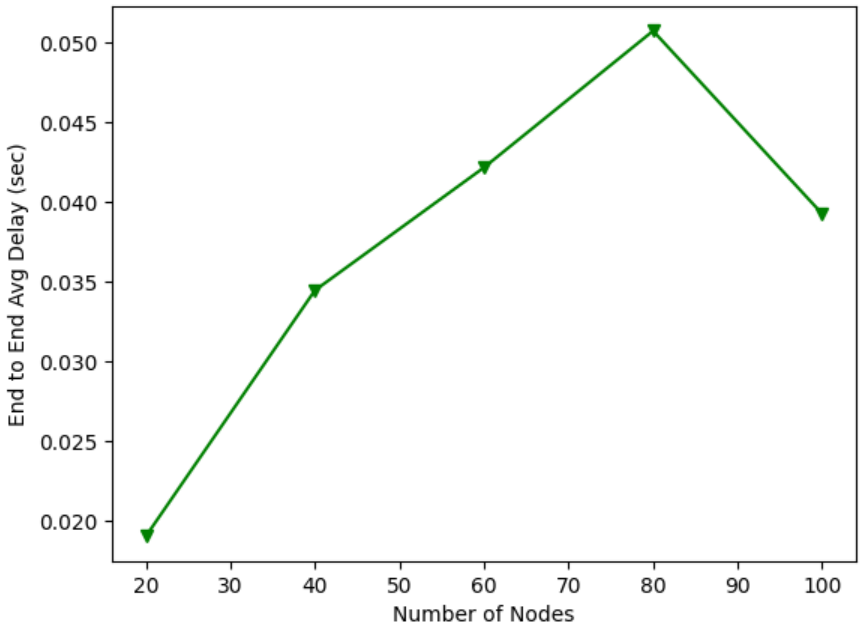


Varying Number of Nodes:

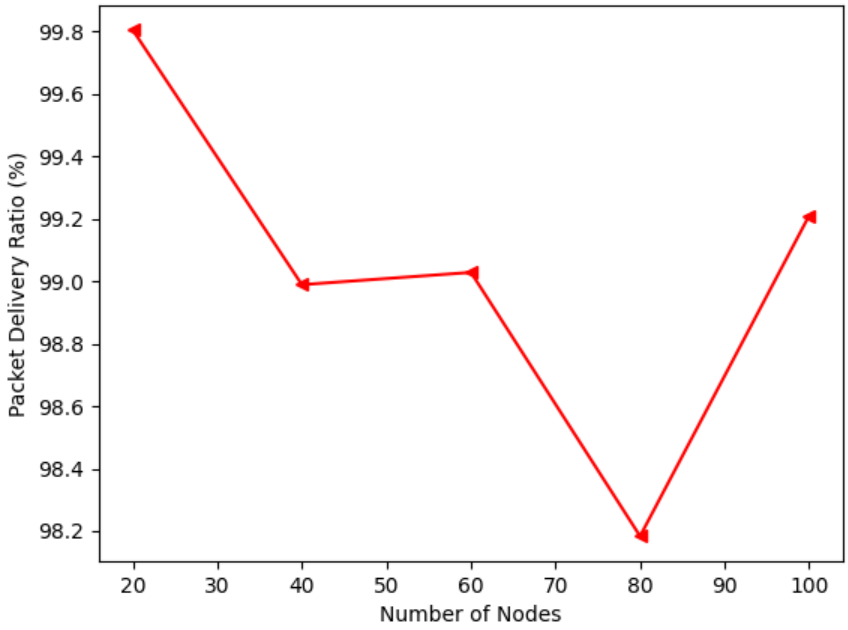
Average Throughput



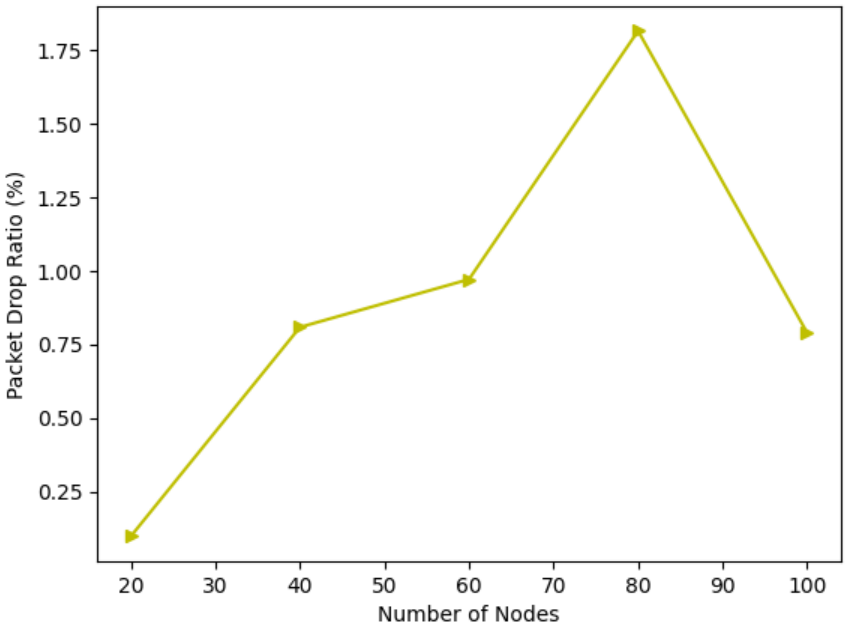
End-to-end Delay



Packet Delivery Ratio

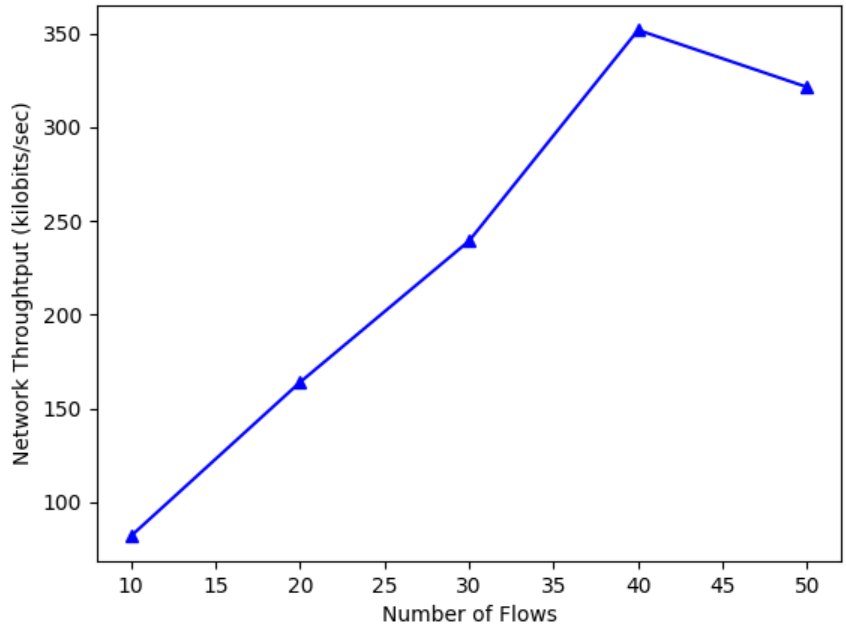


Packet Drop Ratio

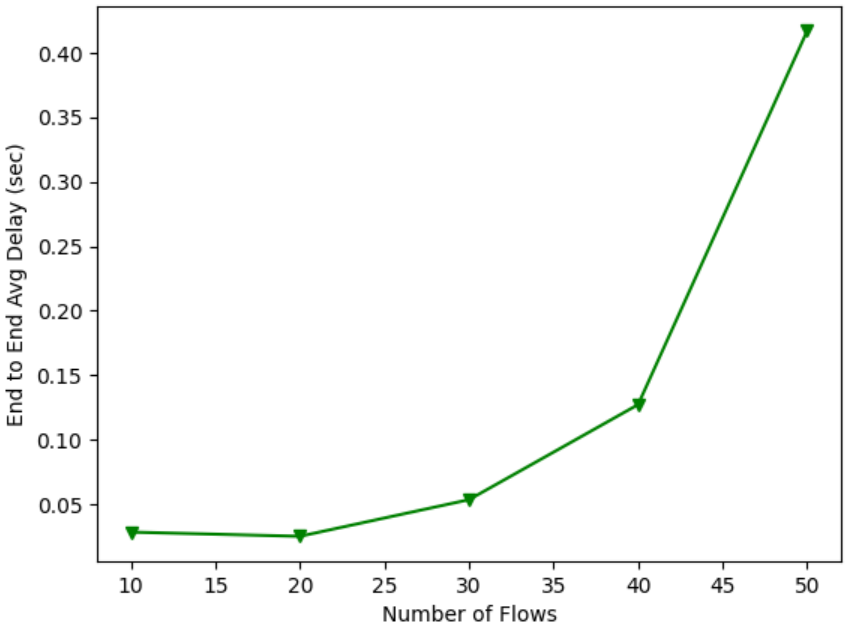


Varying Number of Flows:

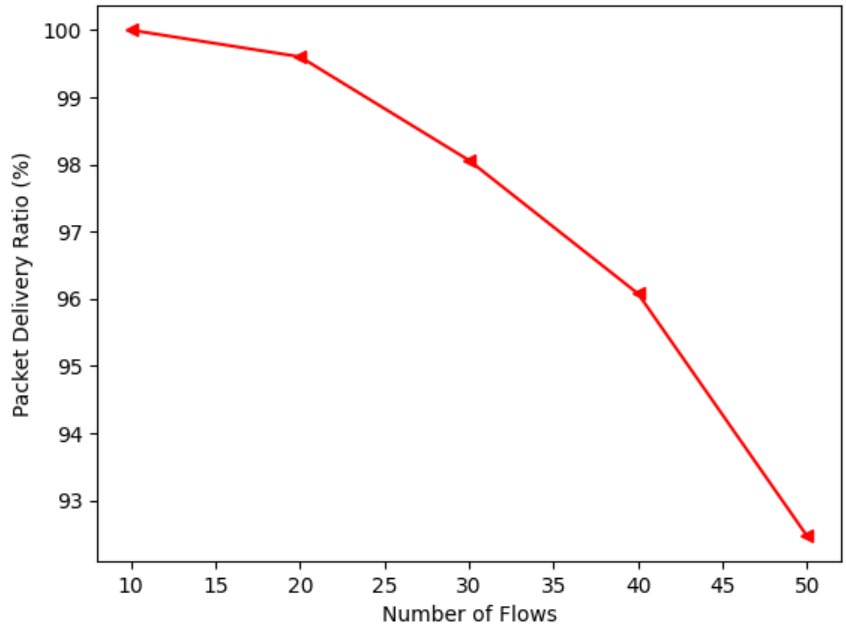
Average Throughput



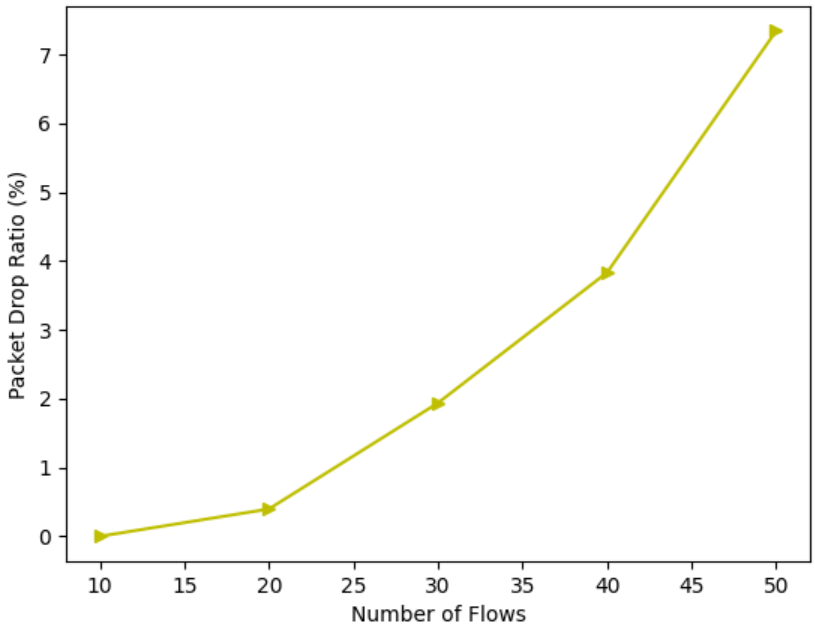
End-to-end Delay



Packet Delivery Ratio



Packet Drop Ratio



Observations:

1. As expected with the increase of distance the throughput, delivery ratio decreases and packet drop and delay increases.
2. But for increasing nodes the graphs seem a bit random.
3. And for increasing flows more packets drop and delay increases.