Short Descriptions

Mac 802.11

IEEE 802.11 is a set of standards for wireless local area network (WLAN) computer communication. It specifies the **physical layer (layer-1)** and **media access control (layer-2)** layers of **OSI reference model** for wireless communications. "Mac" in "802.11 Mac" refers to the MAC layer, which provides the protocol for accessing the wireless media and managing communication on the network.

Note: My original parameter was Mac 802.15.4. Since it was generating negative throughput, I shifted to Mac 802.11 which provided positive throughput.

DSR

DSR (Dynamic Source Routing) is a routing protocol in ad-hoc wireless networks, where nodes act as routers and dynamically find routes to destinations. It is a reactive protocol, meaning that it only finds a new route when needed, rather than proactively maintaining a route table like in a traditional network. DSR utilizes source routing, where the complete path from source to destination is included in each packet, reducing the overhead on intermediate nodes.

UDP

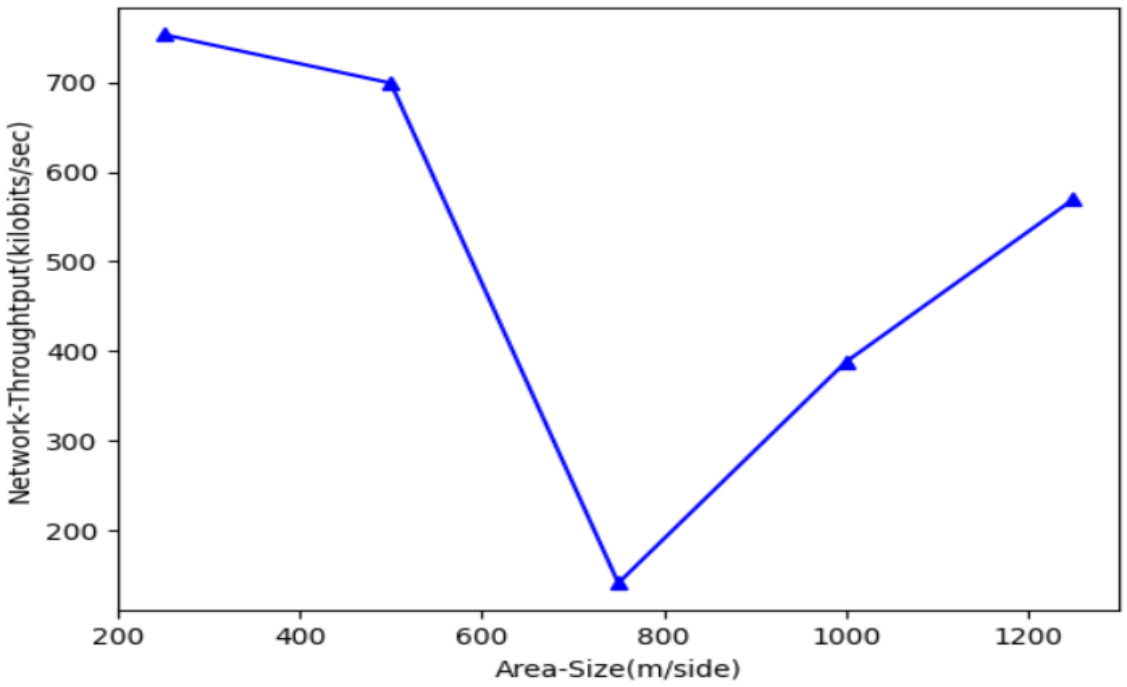
UDP (User Datagram Protocol) is a simple, connectionless Internet protocol for transmitting datagrams (packets) over a network. It operates at the transport layer of the Internet protocol suite and is used by many applications as a reliable, efficient alternative to TCP (Transmission Control Protocol). Unlike TCP, UDP does not provide error checking or retransmission of lost packets, making it faster but less reliable. Applications that require low latency or are tolerant of lost packets, such as video streaming or online gaming, often use UDP.

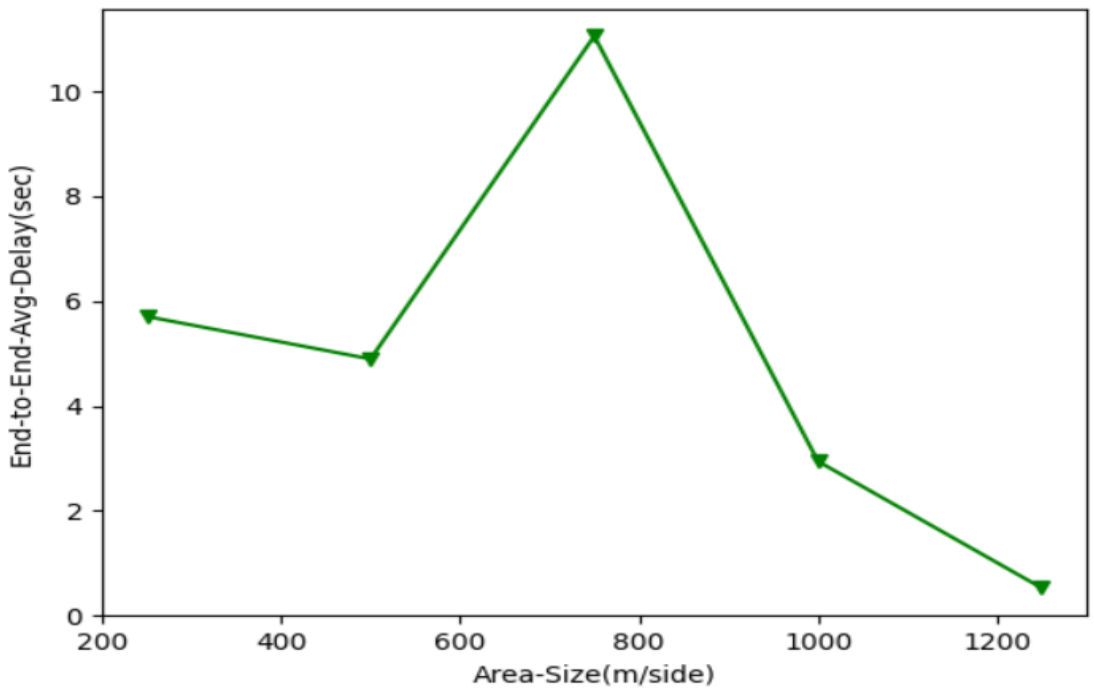
CBR

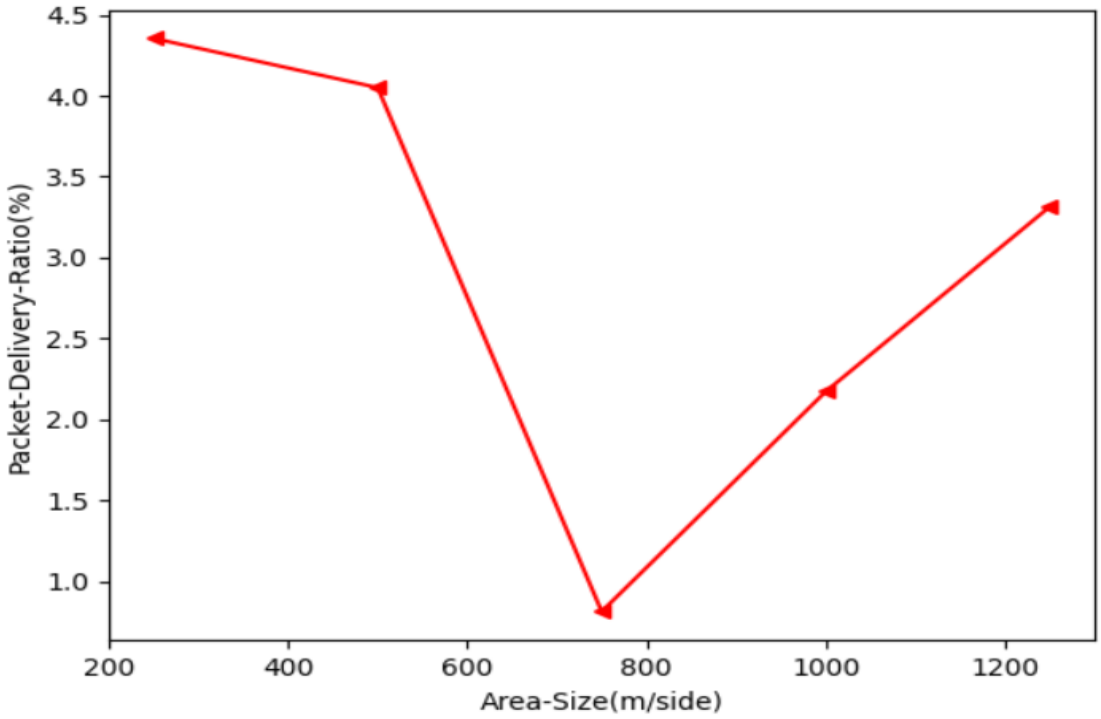
CBR (Constant Bit Rate) is a traffic characterization in computer networks. It refers to a traffic pattern where a constant bit rate of data is sent in a steady stream over the network, with a consistent number of bits per second transmitted. CBR is often used in real-time applications, such as audio or video streaming, where a consistent, predictable delivery of data is necessary to maintain quality. In these cases, CBR is guaranteed by the network through a technique called Quality of Service (QoS) management, which sets aside bandwidth and prioritizes CBR traffic over other types of traffic.

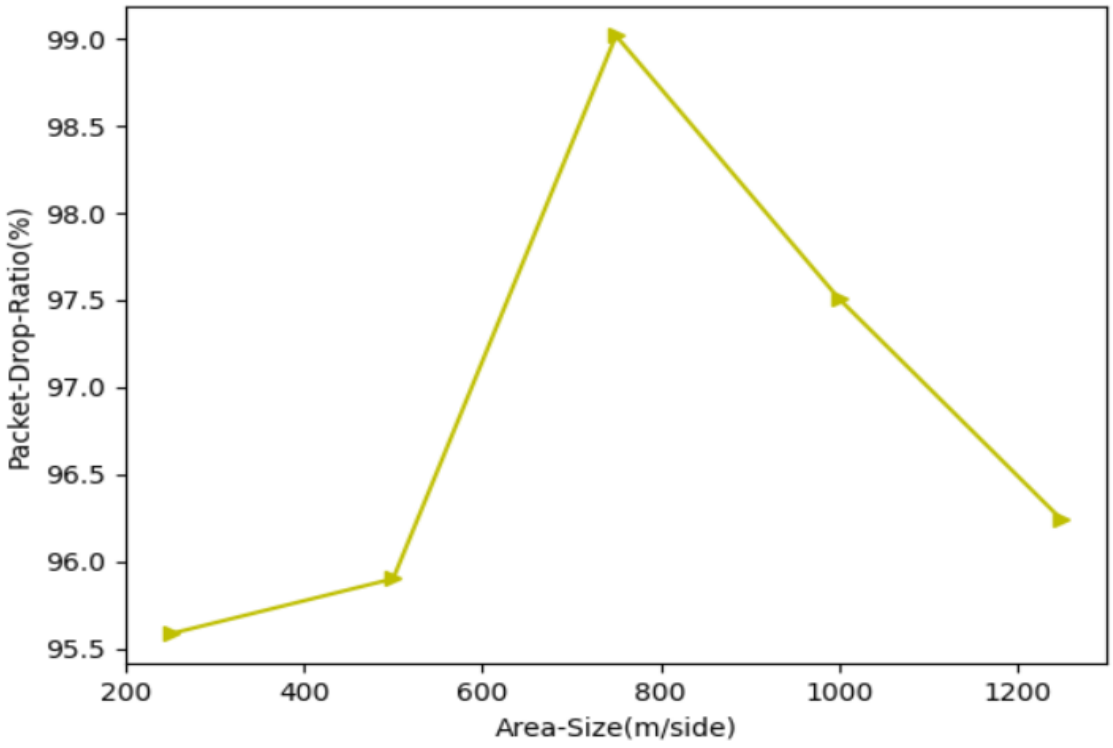
Graphs

Varying area size

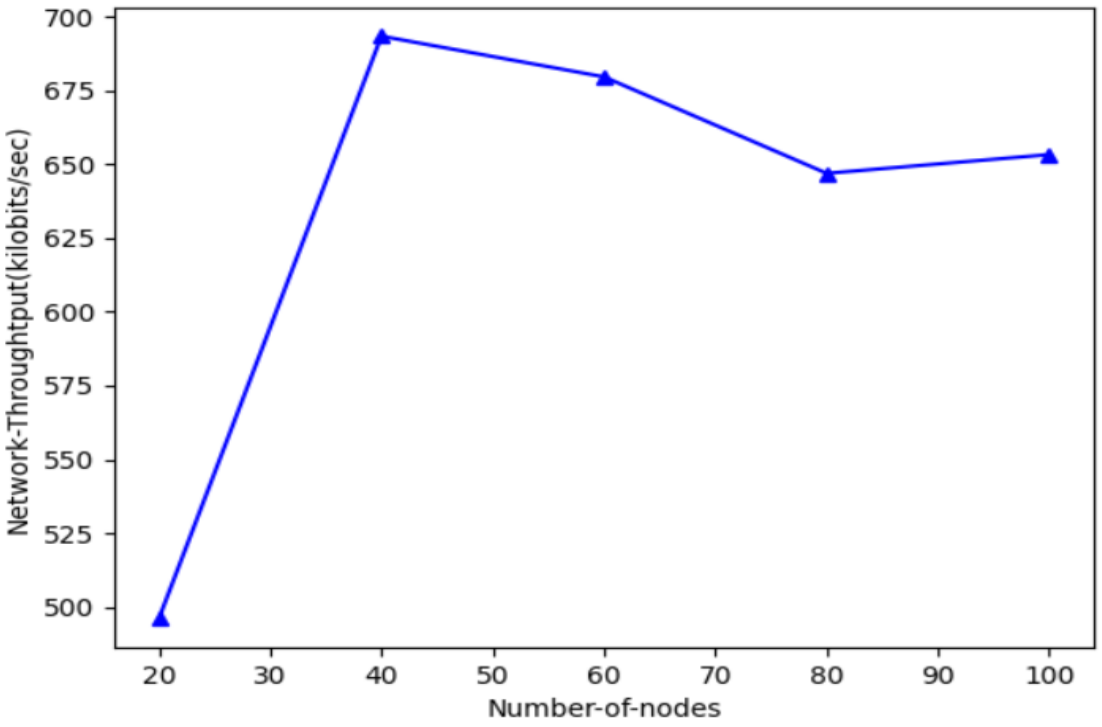


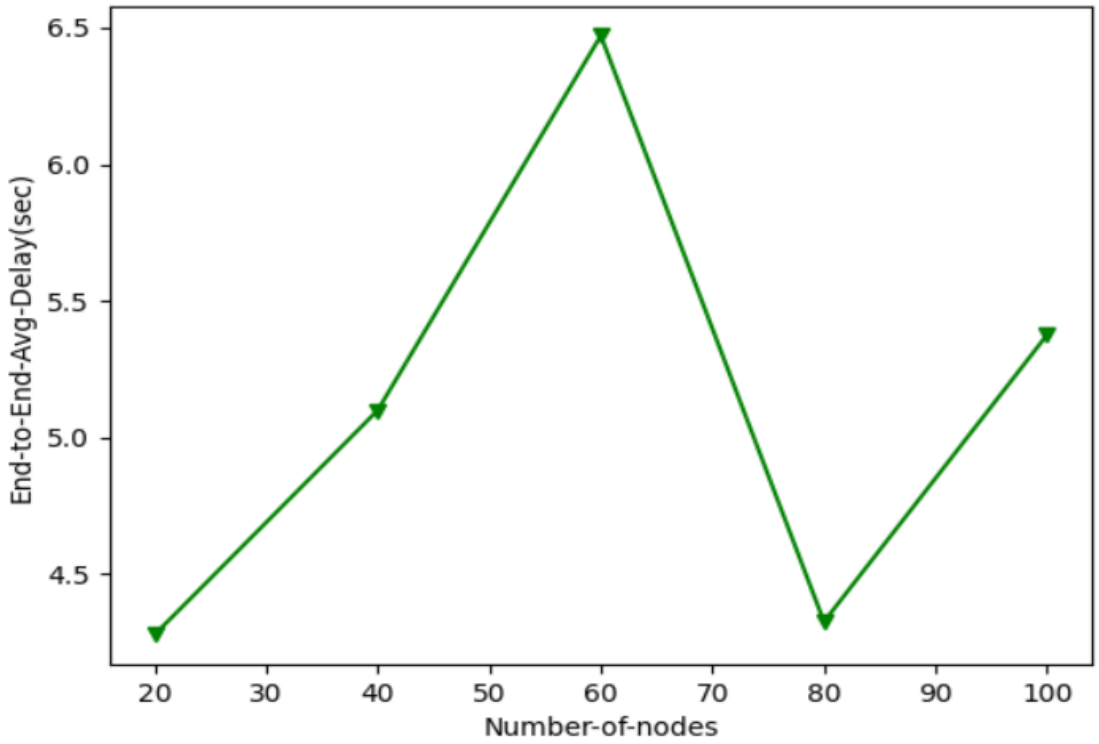


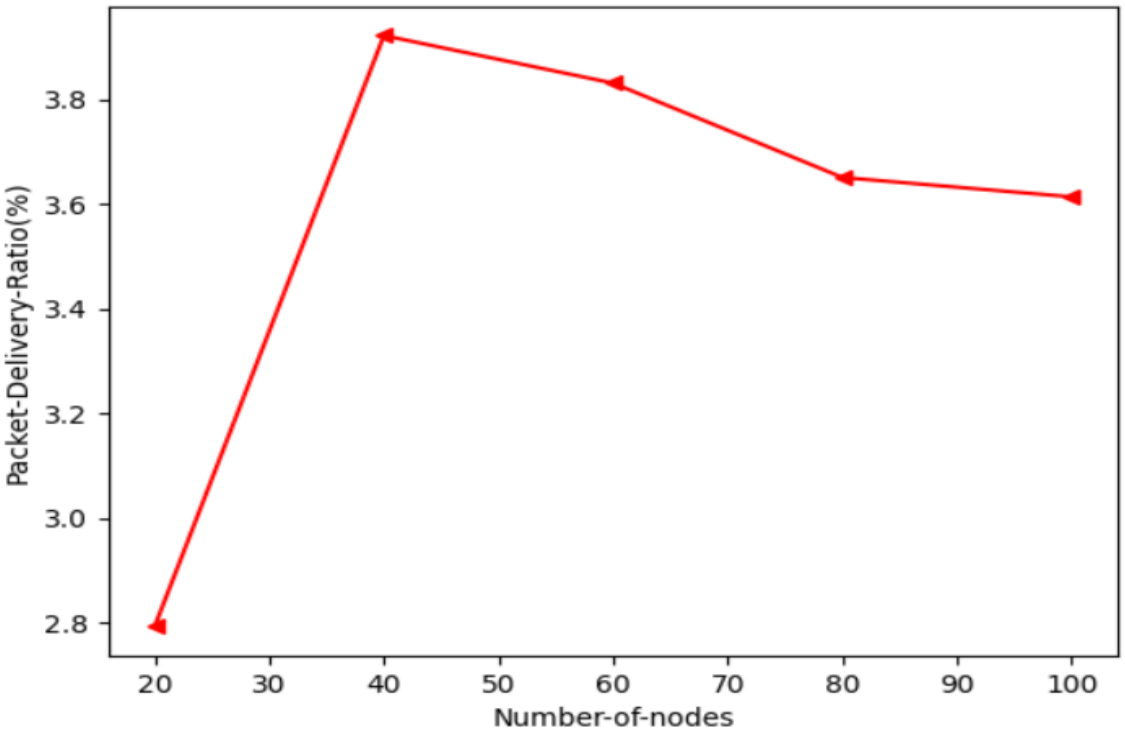

Packet-Delivery-Ratio(%)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
200
400
600
800
1000
1200
Area-Size(m/side)

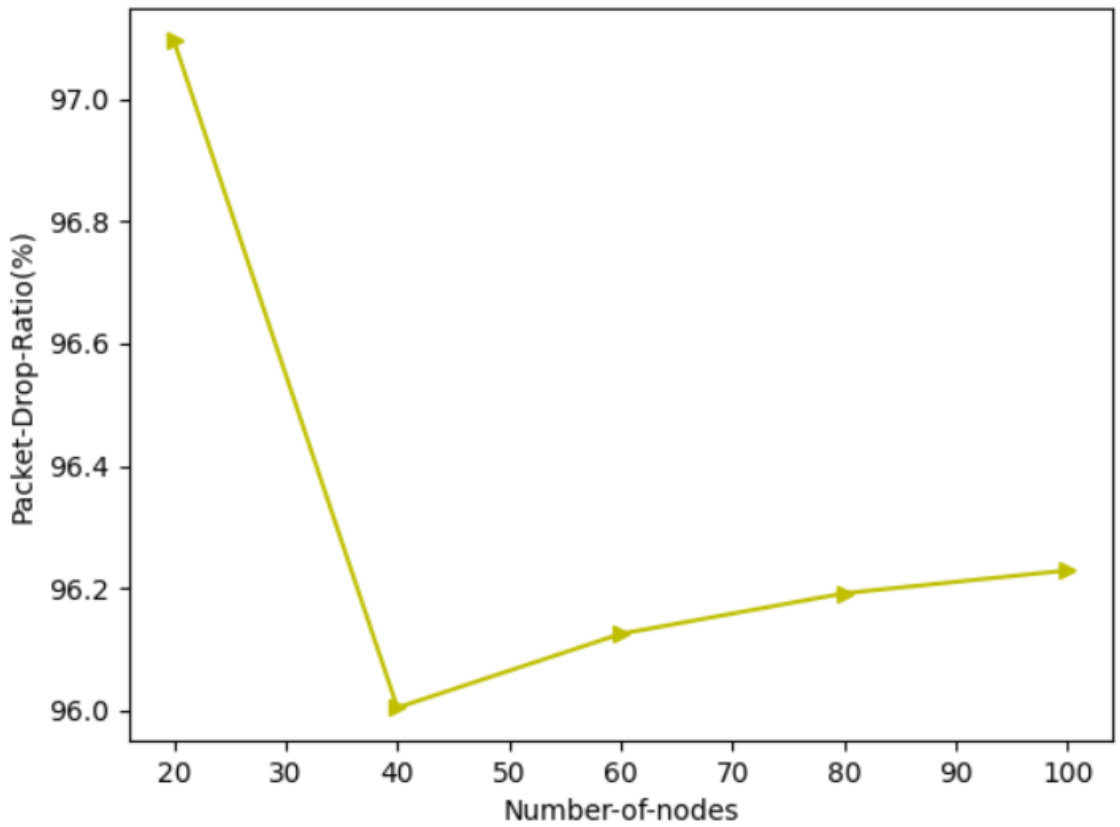

Packet-Drop-Ratio(%)
99.0
98.5
98.0
97.5
97.0
96.5
96.0
95.5
200
400
600
800
1000
1200
Area-Size(m/side)

Varying nodes

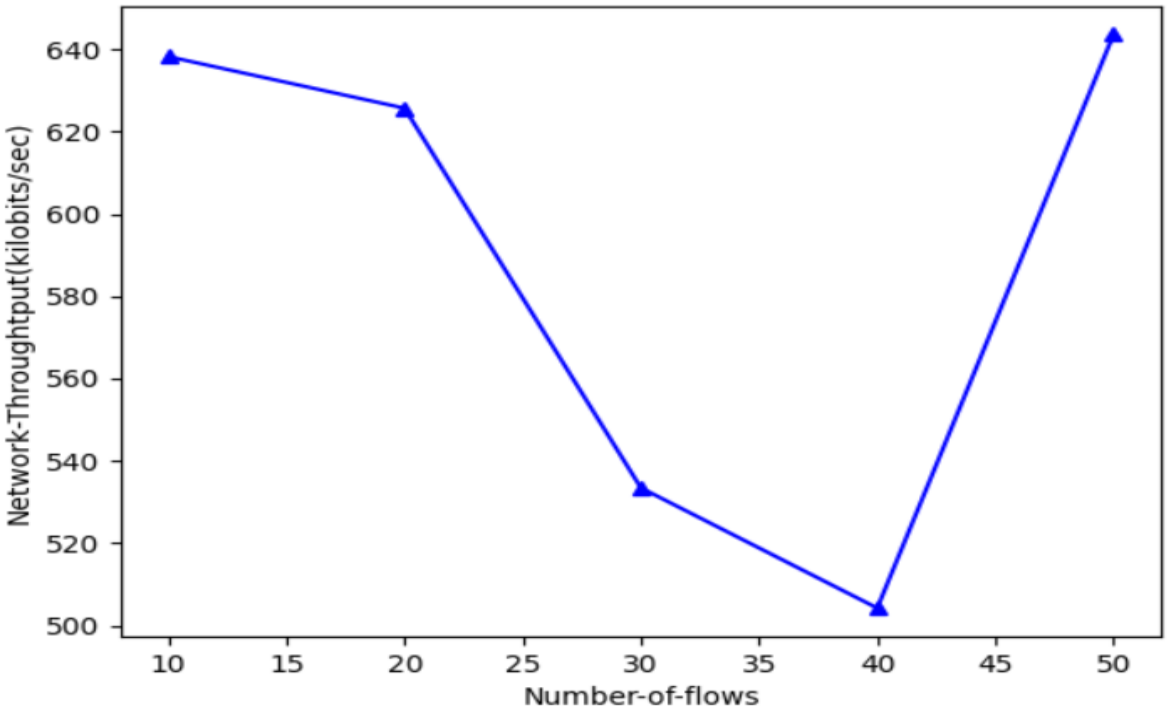


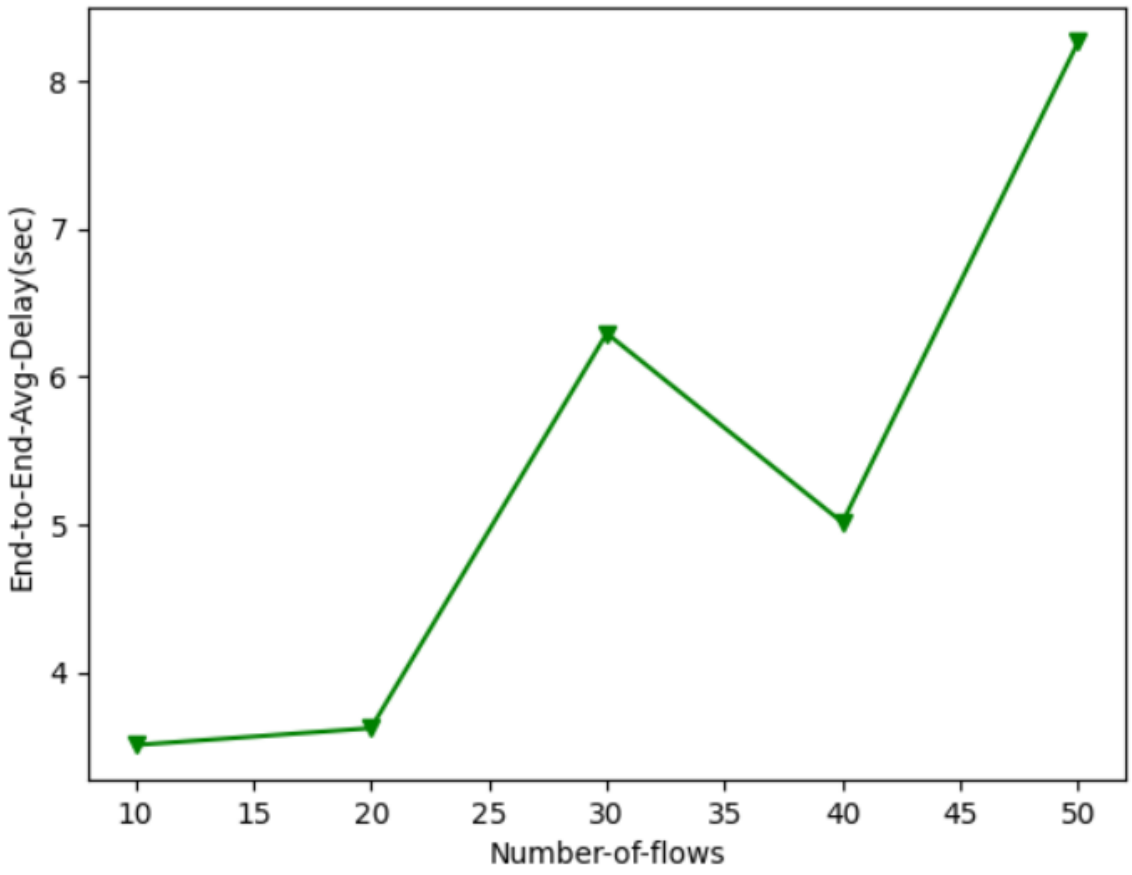


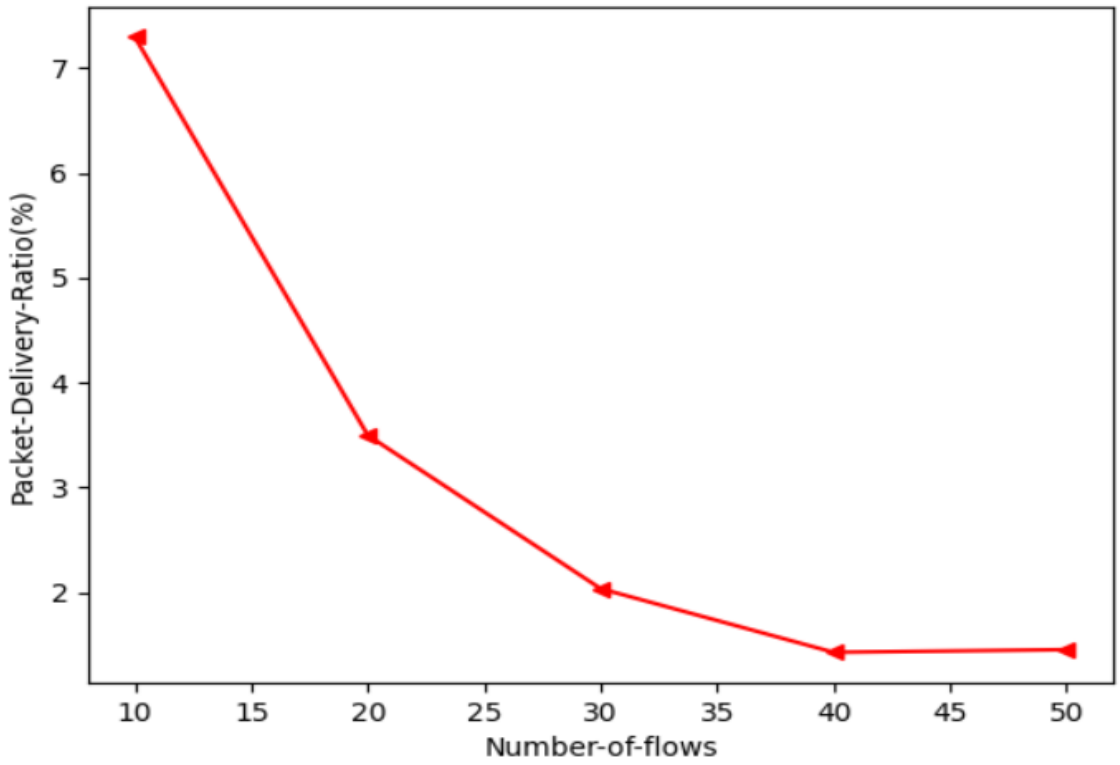

Packet-Delivery-Ratio(%)
3.8
3.6
3.4
3.2
3.0
2.8
20
30
40
50
60
70
80
90
100
Number-of-nodes

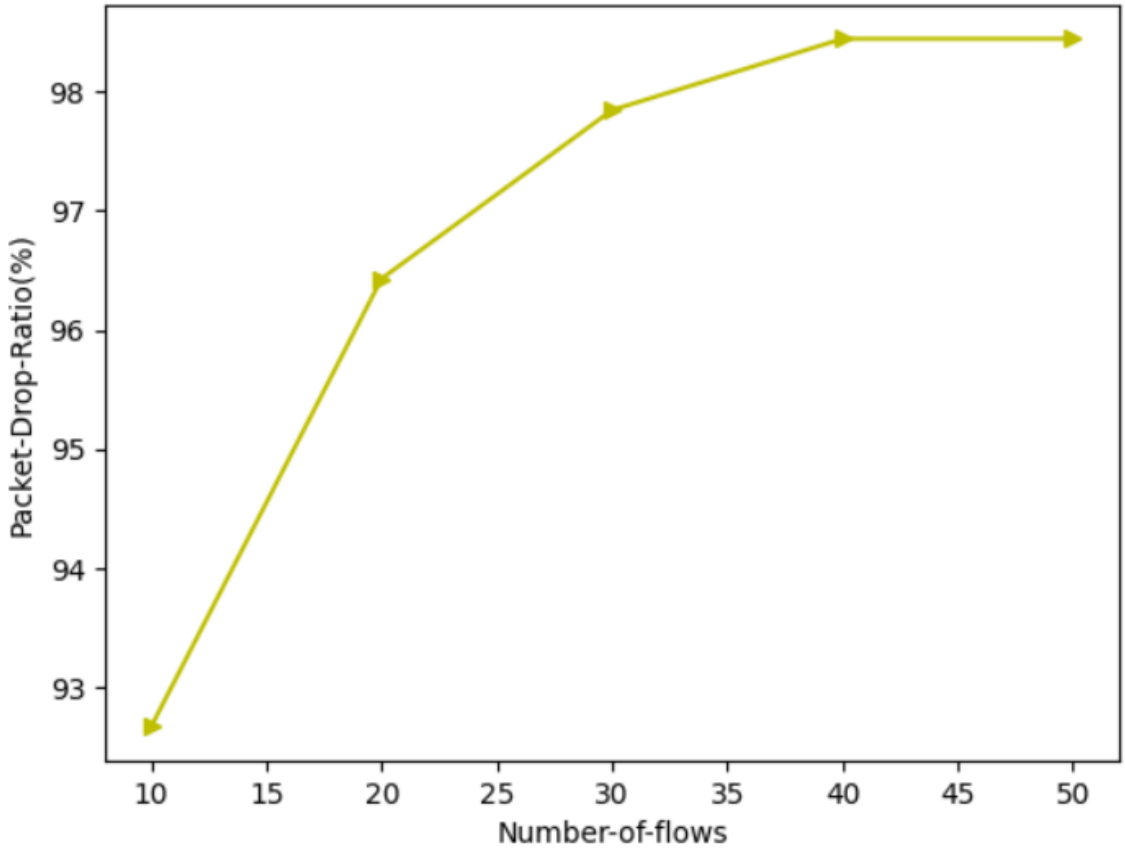

Packet-Drop-Ratio(%)
97.0
96.8
96.6
96.4
96.2
96.0
20
30
40
50
60
70
80
90
100
Number-of-nodes

Varying flows






Packet-Delivery-Ratio(%)
7
6
5
4
3
2
10
15
20
25
30
35
40
45
50
Number-of-flows


Packet-Drop-Ratio(%)
98
97
96
95
94
93
10
15
20
25
30
35
40
45
50
Number-of-flows

Specific Metric Related Observations

Area Size / Nodes

As area size OR number of nodes increases ---

The metrics displayed no predictable behavior

Flows

As number of flows increases ---

Throughput generally decreases but there was a steep rise for flow=100

End-to-end average delay increases

Packet delivery ratio decreases

General Observations

UDP is a connectionless protocol which makes it unreliable. This claim is justified as we can observe amount of packet drop is significantly higher than amount of packet received

When simulation is stopped, some packets are neither in “received” state, nor in “dropped” state. Therefore, summation of received and dropped packets do not equal sent packets.