Report

MAC Type: 802.11
Routing protocol: AODV
Agent Type: UDP
Application Type: CBR Traffic

802.11

802.11, developed by a working group of IEEE, is an evolving family of specifications for wireless local area networks(WLANs). All the 802.11 specifications use the Ethernet protocol and Carrier Sense Multiple Access with Collision Avoidance(CSMA/CA) for path sharing. Phase-shift keying(PSK) is the original modulation but other modulations such as complementary code keying(CCK) are also used.

AODV

AODV(Ad-hoc On-demand Distance Vector) is a loop-free routing protocol for ad-hoc networks. It is designed to be self-starting in an environment of mobile nodes with a variety of network behaviours. AODV maintains a routing table at each node. The routing table entry for a destination contains three essential fields: a next hop node, a sequence number and a hop count. All packets destined to the destination are sent to the next hop node. The sequence number acts as a form of time-stamping, and is a measure of the freshness of a route. The hop count represents the current distance to the destination node.

UDP

The User Datagram Protocol(UDP) is a core member of the Internet protocol suite. It is a simple message oriented transport layer protocol. UDP uses a connectionless communication model with a minimum of protocol mechanisms. It has no handshaking process, thus the user's programs are exposed to unreliability of the underlying network. There's no guarantee of delivery, ordering or duplicate protection. UDP is suitable where error checking and correction are either not necessary or are done in the application.

CBR Traffic

The Constant Bit Rate(CBR) service category is used for connections the transport traffic at a constant bit rate. There should be inherent reliance on time sunchronization between traffic source and destination. This is an application layer protocol.

UDP/CBR traffic offers three basic characteristics-

1) Unreliable - as we know, the sender doesn't take the responsibility of the lost packet

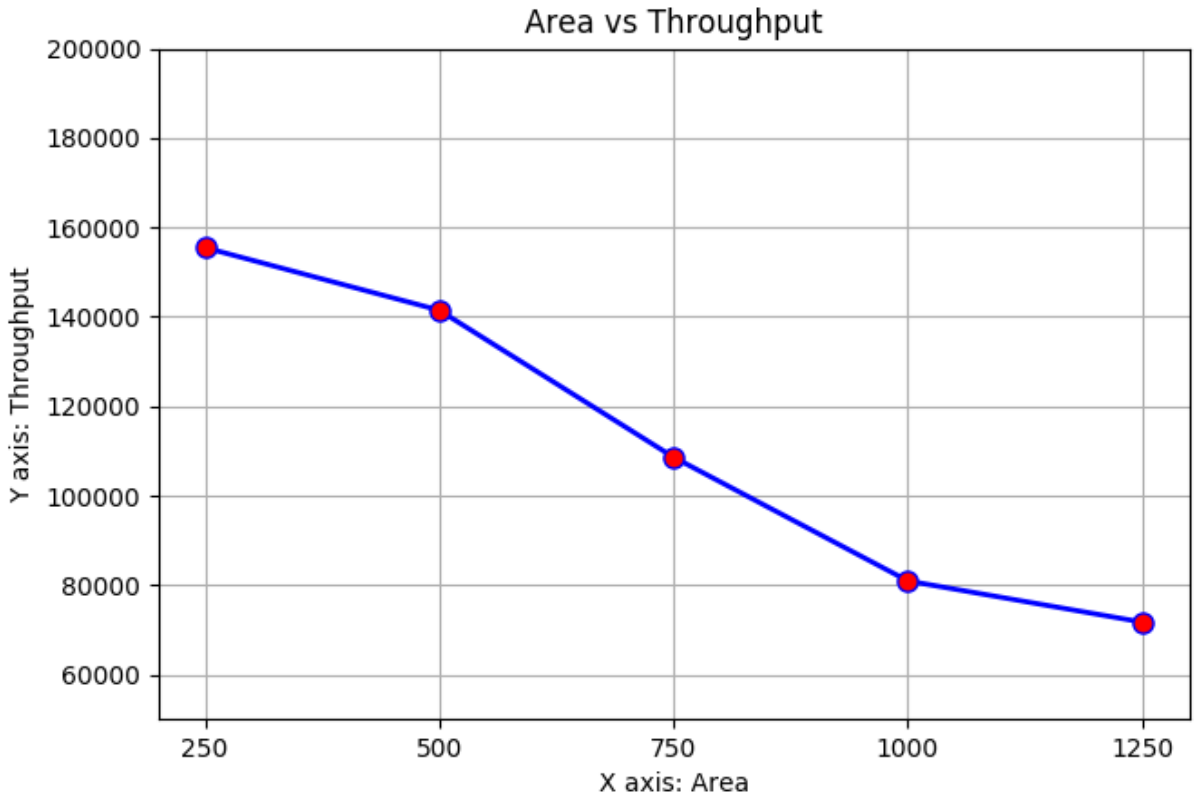
2) Unidirectional - only forward directional data flow takes place, no ack is returned

3) Predictable – as it offers constant bit rate, fixed packet size, fixed interval, fixed and known packet stream

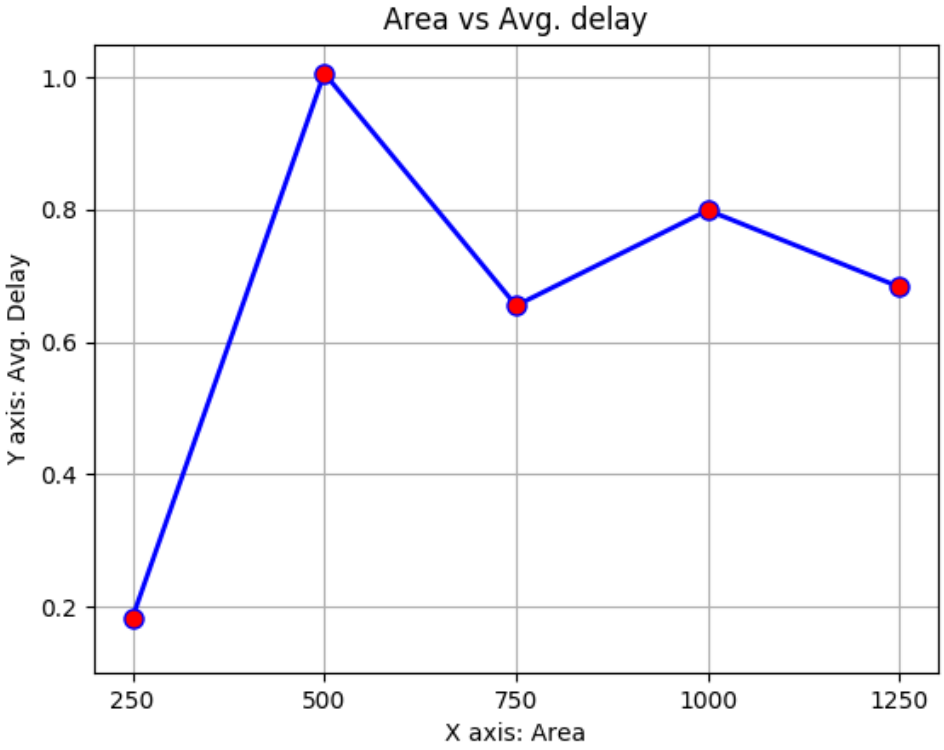
GRAPHS

<u>Varying Network Area:</u>

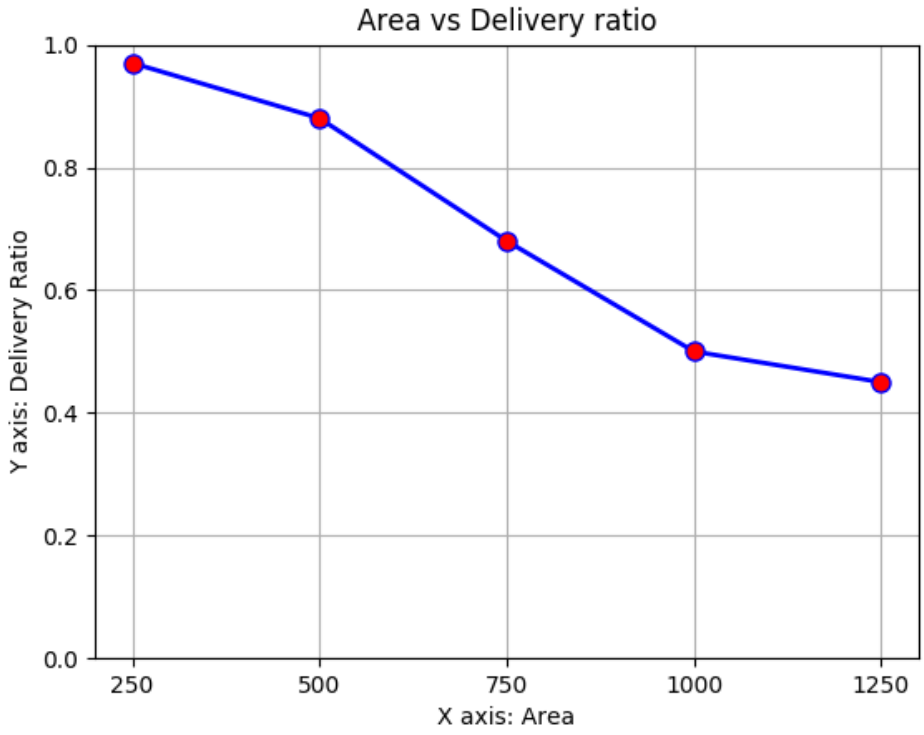
1) Area(mxm) vs Throughput(bits/sec)



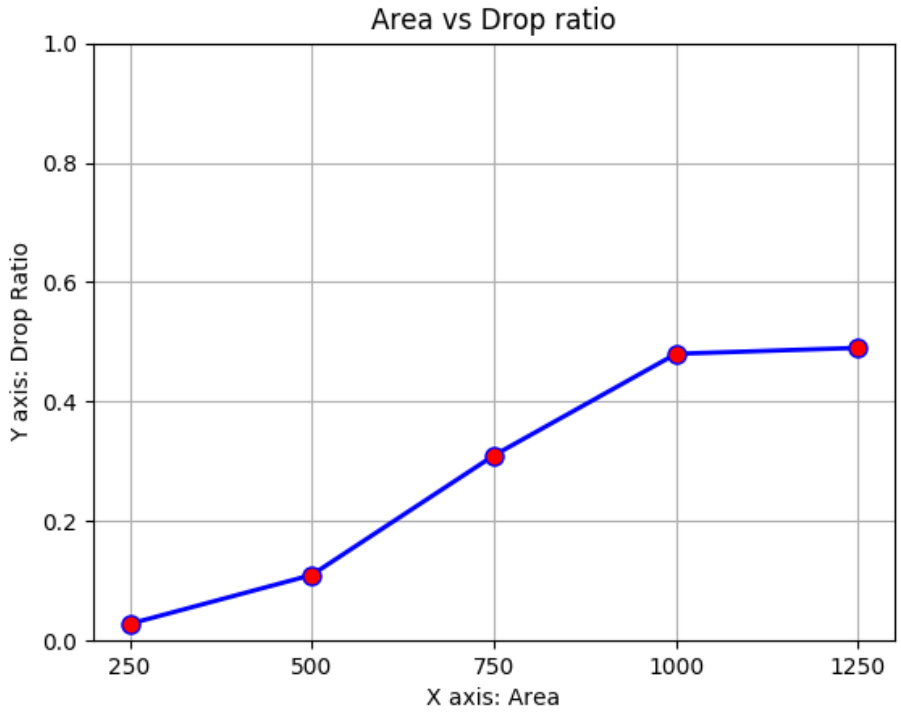
2) Area(mxm) vs Avg. Delay(secs)



3) Area(mxm) vs Delivery Ratio

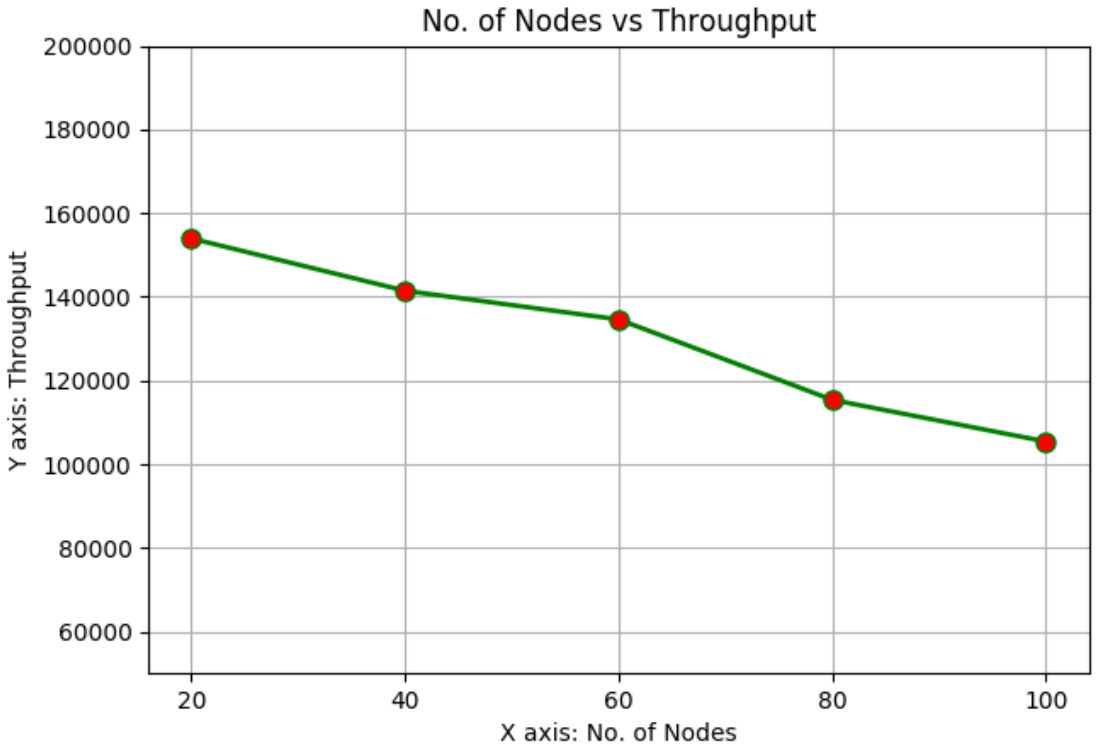


4) Area(mxm) vs Drop Ratio

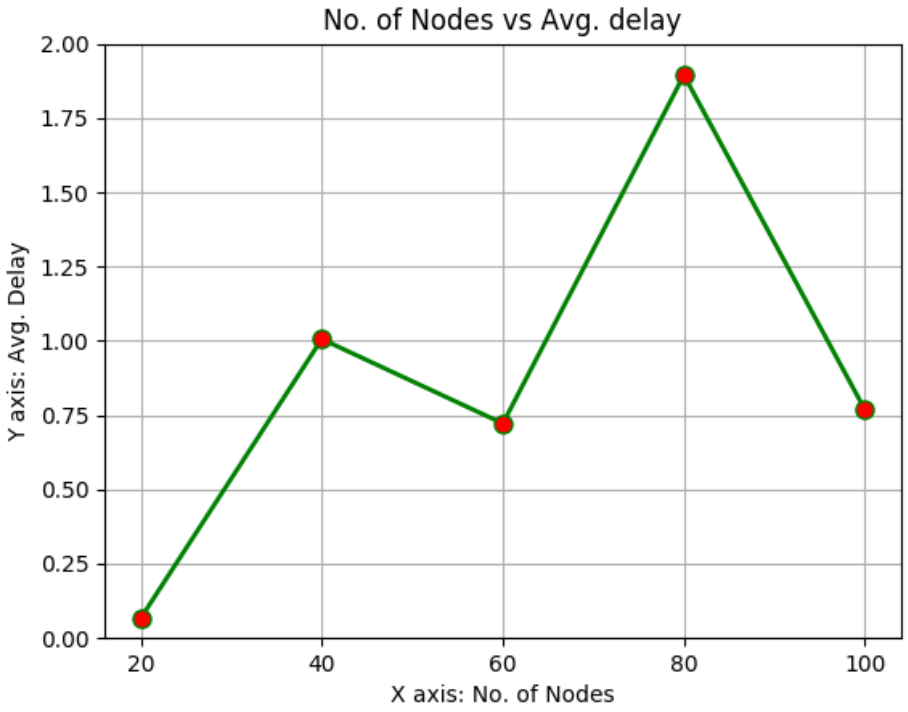


Varying Number of Nodes

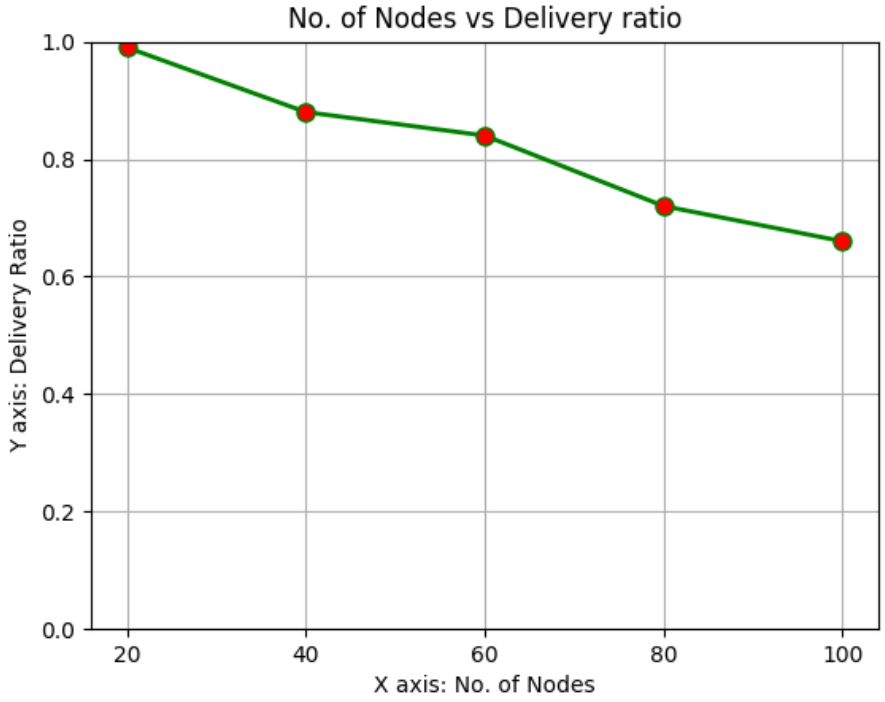
1) No. of Nodes vs Throughput(bits/sec)



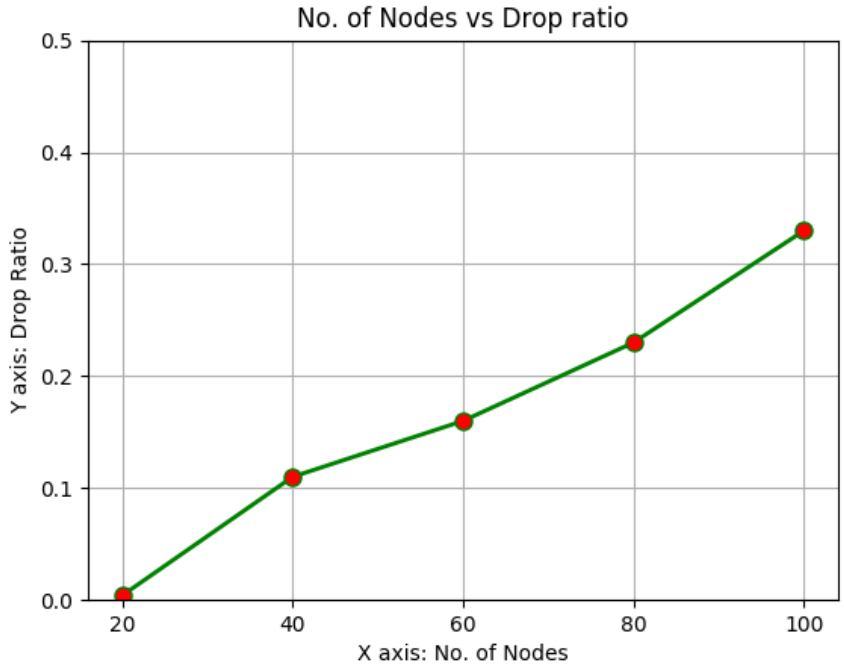
2) No. of Nodes vs Avg. Delay(secs)



3)No. Of Nodes vs Delivery Ratio

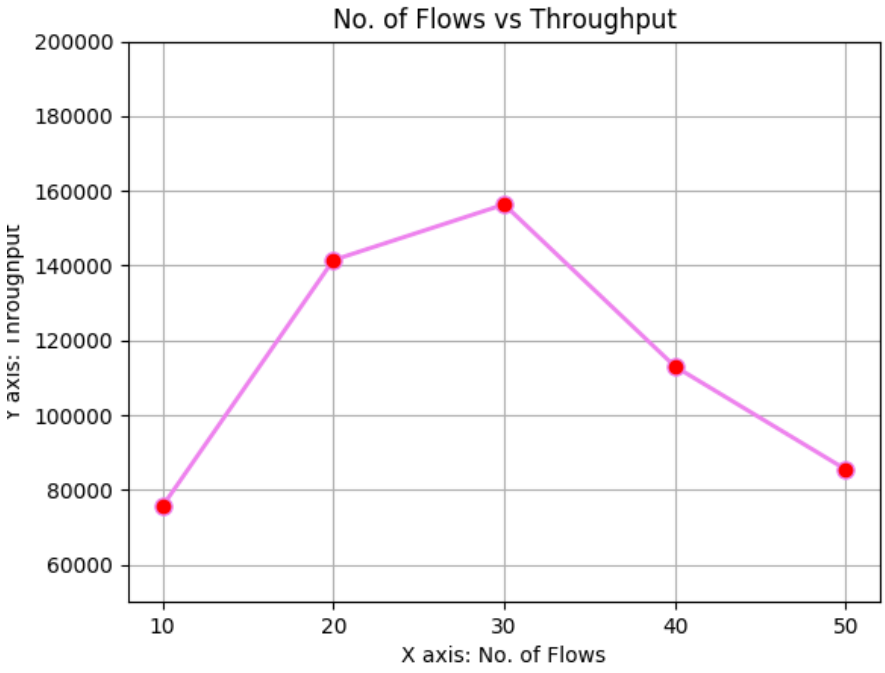


4)No. Of Nodes vs Drop Ratio

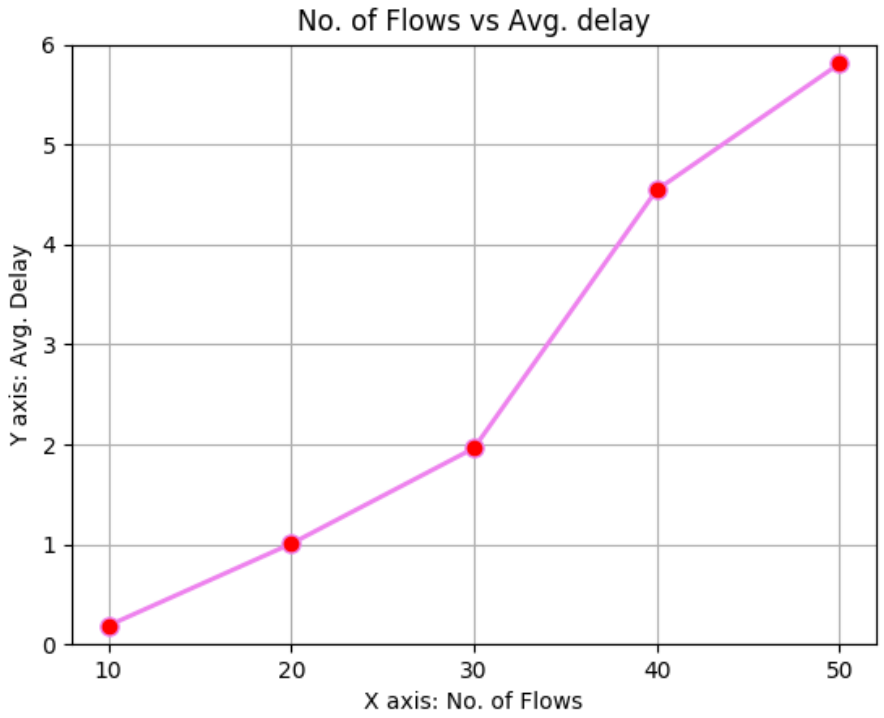


Varying Number of Flows

1)No. Of Flows vs Throughput(bits/sec)

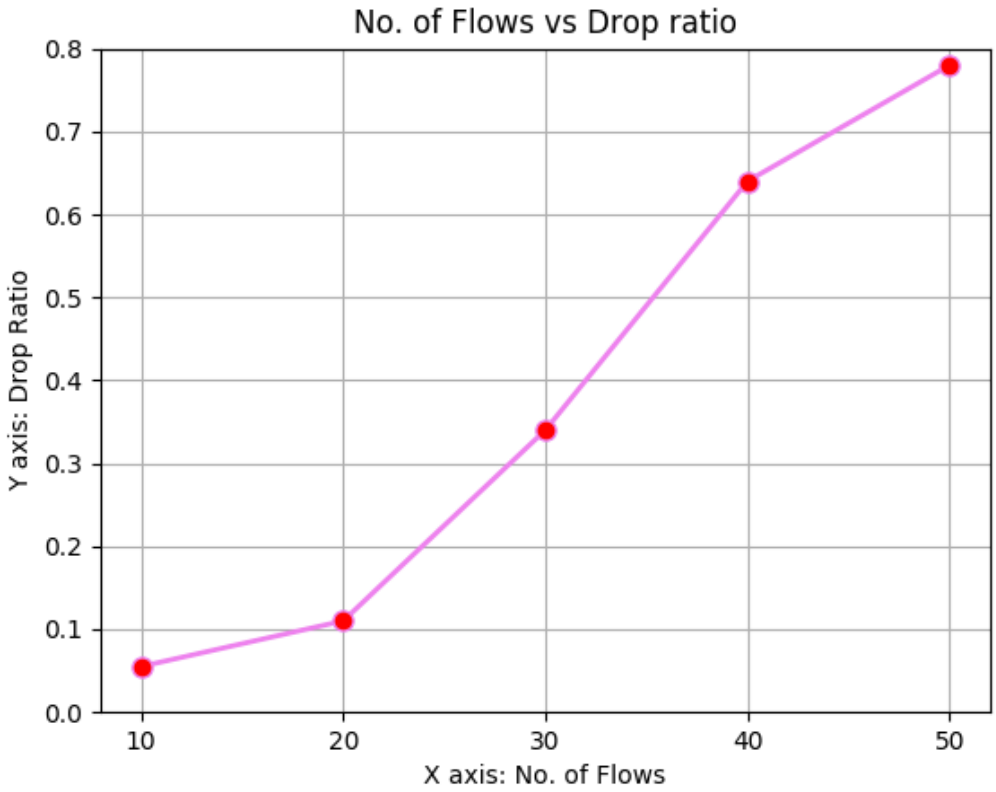


2)No. Of Flows vs Avg. Delay(secs)



3)No. Of Flows vs Delivery Ratio

4)No. Of Flows vs Drop Ratio



Observations on the results

In case of varying network area, we noticed that as we enlarge the area, the network throughput varies and decreases as shown in graph; the end to end delay is not uniform also, it firstly increases and afterwards decreases a little; the packet delivery ratio decreases because of the enlargement of network area and the packet drop ratio increases as well.

In case of varying number of nodes, we noticed as we enlarge the number of nodes, throughput varies a little, end to end average delay isn't uniform and varies quite a lot, the delivery ratio slightly decreases and so the drop ratio increases a little.

In case of varying number of flows, as we enlarge the number of flows, throughput changes quite a lot but the change is not uniform, end to end avg. delay increases and the delivery ratio decreases and so the drop ratio increases a lot.