

Congestion Control in MANET using NS-3

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Abstract- In versatile Ad-hoc networks (MANET), blockage happens with restricted assets. TCP blockage control works very well on the Internet. Yet, portable specially appointed systems show some extraordinary properties that significantly influence the structure of fitting conventions and conventions stacks when all is said in done, and of clog control component specifically. As it turned out, the immeasurably varying condition in versatile specially appointed system is profoundly hazardous for standard TCP. Numerous methodologies have been proposed to defeat these challenges. Portable specialist based clog control method is proposed to maintain a strategic distance from blockage in impromptu system. At the point when portable specialist goes through the system, it can choose a less-stacked neighbor hub as its next jump and update the directing table as indicated by the hub's clog status. With the guide of portable specialists, the hub can get the dynamic system topology in time. Right now, versatile specialist based clog control component is introduced. To decrease the in cast likelihood across various TCP conventions and the system great put can be expanded reliably by on normal 7x under a few clog. OSLR uses a method called a multipoint transferring for advanced message flooding. OSLR's points of interest is as a proactive convention, the courses to all goals is known and kept up before the usage.

Keywords: Congestion Control, MANET, NS-3, AODV, OSLR.

1. INTRODUCTION

Versatile extraordinarily named system (MANET) (or structure less system) is a mix of advantageous focuses which shapes a system without focal affiliation or standard help gadgets routinely accessible in conventional structures. Focuses right now both produce client and application traffic and do sift through control and directing shows. For the improvement of adaptability, different courses were made. The planning overhead accomplished in keeping up the relationship among source and target focus focuses can be reduced by picking the different routes in a single course exposure. In light of the center flexibility or battery dissatisfaction, the fundamental way may miss the mark. The assistant ways are used to transmit data groups with the objective that extra overhead is created by another course exposure. The coordinating show gives this movement. The coordinating show is guiding count that gives that the most ideal route from the source to the objective. Guiding is the path toward sending the packages from source to the objective by the best course to the send the groups is managed by the coordinating estimation.

2. OVERVIEW OF ROUTING PROTOCOL

In ad-hoc network there are different routing protocols are available. But from these protocols we have used OLSR and AODV in our research network.

OLSR

The connection state steering conventions implies most prominent today in the open source world is OSLR. One of the proactive steering conventions, OSLR convention, which develops a course for information transmission by keeping up a directing table inside each hub of the system. To figure directing table information on topology data is utilized. This information is traded by methods for Topology control (TC) parcels. The TC parcels thus are worked after each hub has filled its neighbors list. This rundown contains the personality of neighbor hubs. A hub is viewed as a neighbor if and just in the event that it very well may be come to by means of a bi-directional connects. OSLR utilizes HELLO messages to locate its one bounce neighbors and its two jump neighbors through their reactions. The sender would then be able to choose its multipoint Relays (MPRs) in view of the one jump hub which offers the best courses to the two bounce hubs. By along these lines, the measure of control traffic can be diminished. Every hub has additionally a MPR selector set. MPR selectors set ascertain hubs that have chosen it as a MPR hub. To put it plainly, every hub processes the way towards a goal by methods for a basic briefest way calculation, with jump consider target metric. Along these lines, a most limited way can result to be likewise not great, from the perspective the bundle mistake rate.

AODV

AODV is receptive steering convention, so a course is made when a hub needs to send a parcel. Each hub sends intermittently hi messages to discover its neighbors. At the point when a hub needs to send a parcel to goal which isn't a neighbor send a course demand (RREQ) to neighbors to discover a way, AODV ensures these courses don't contain circles and attempts to discover briefest course conceivable. AODV is likewise ready to deal with changes in courses and can make new courses if there is a blunder. Specially appointed on-request separation vector (AODV) steering is a directing convention for impromptu systems. It is an on-request and separation vector directing convention, implying that a course is built up by AODV from a goal just on-request. AODV is fit for unicast just as multicast steering. It keeps these courses as long as they are alluring by the sources. Also, AODV makes trees which associate multicast bunch individuals. The trees are made out of the gathering individuals and the hubs expected to associate the individuals. The succession numbers are utilized by AODV.

3. SIMULATION DESCRIPTION AND DESIGN

For reproduction there are diverse test system are accessible, for example, NS-2, NS-3, Qualnet, MATLAB, and so forth. Among the all we have utilized NS-3 to play out a reproduction of specially appointed system.

NS-3

The NS-3 test system is created and dispersed totally in the C++ programming language, since it better encouraged consideration of C-based execution code. The objectives of NS-3 are set high: to make another system test system lined up with present day inquire about requirements and create it in an open source network. Clients of NS-3 are allowed to compose their reproduction contents as either C++ principle projects or python programs. The NS-3's low level API is arranged towards the power-client however increasingly available "assistant" APIs are overlaid on the highest point of the low-level API. So as to accomplish versatility of countless reenacted arrange components, the ns-3 reproduction instruments additionally bolster disseminated recreation. The ns-3 help institutionalized yield positions for following formation, for example, the pcap group utilized by organize parcel investigating devices, for example, tcp dump, wire shark. The ns-3 test system is outfitted with Pyviz envision, NetAnim-3.017 which has been coordinated into mainline ns-3, beginning with adaptation 3.25. It tends to be generally valuable for investigating purposes.

Table-1 briefs the simulation parameters of our research

Parameters	Values
Area size	1000m x 1000m
MAC	IEEE 802.11b
Wireless Interface Mode	Ad-Hoc Network
Propagation Delay Model	Constant Speed Propagation Delay Model
Number of Nodes	25
Number of Flows	1 (5 -> 1)
Transport Protocol	TCP New Reno
Maximum Segment Size	536
Data Rate	1Mbps
Routing Protocol	AODV, OLSR
Hello Interval	0.5,1.0,1.5,2.0,2.5,3.0
Packet size	1024
Number of Packets	1000

4. METHODOLOGY

Our project on congestion control in MANET using NS-3 is based on some concepts and methodologies that we devised during our initial study and visualization of the project. We have planned our project keeping in mind the networking concepts that can be applied to the project. The project is strongly supported at the back end by python programming language. The front end is developed using object oriented programming language. The initial we have to provide number of inputs in the program such as maximum segment size, data rate, routing protocol, Hello interval, Packet size, number of Packets. The detail description about all the Inputs:

Maximum Segment Size:

The most extreme fragment size (MSS) is a parameter of the alternatives field of the TCP header that indicates the biggest measure of information, determined in bytes, that a PC or specialized gadget can get in a solitary TCP portion. It doesn't tally the TCP header or the IP header.

Data Rate:

The information rate is a term to indicate the transmission speed, or the quantity of bits every second moved. The helpful information rate for the client is generally not exactly the genuine information rate moved on the system. One purpose behind this is extra bits are moved for example flagging, the location, the recuperation of timing data at the collector or mistake revision to make up for conceivable transmission blunders. In media communications, it is regular use to express the information rate in bits every seconds(bit/s), see bit rate. In information correspondence, the information rate is frequently communicated in bytes every seconds(B/s).

Routing Protocol: AODV, OSLR Hello Interval:

Directing gadgets send hi bundles at a fixed interim on all interfaces, including virtual joins, to build up and keep up neighbor relationship. The Hello interim determines the time allotment, in a flash, before the directing gadget sends a welcome bundle out of an interface. This interim must be the equivalent on all directing gadgets on a common system. Of course, the steering gadget sends hi bundles like clockwork (Broadcast and point-to-point systems) and 30 seconds (non-communicate numerous entrance (NBMA) systems).

As per the given input we have calculate the following results of following parameters:

Throughput (mbps), mean delay, Mean jitter.

5. RESULT

As per table 1 we have calculated the following results of following parameters: Throughput (Mbps), mean delay. Mean jitter.

Throughput

Normal throughput gauges the normal pace of messages effectively transmitted over the correspondence channels. Chart 1 shows the throughput of 25 hubs. Here we have expanded the welcome interim.

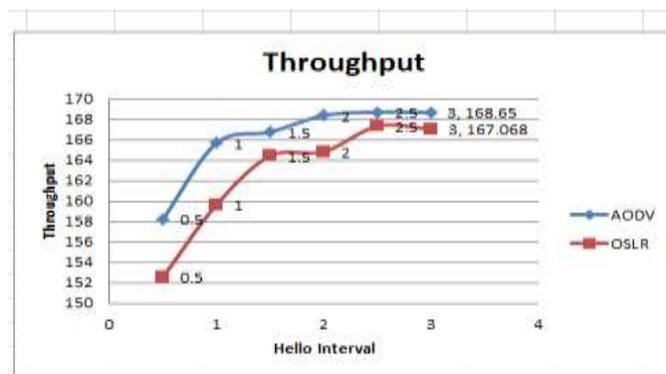


Chart-1 : Throughput

Delay

This rule shows the length of time required to convey a bundle from the sender to the recipient. Chart 2 shows mean deferral in the reenactment of those impromptu system.

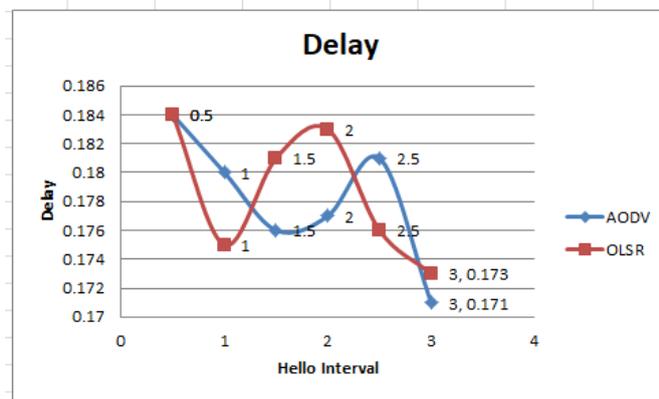


Chart-2: Delay

Jitter

In this creation shows the duration of time between two packet chart 3 shows the Jitter at graph different packets.

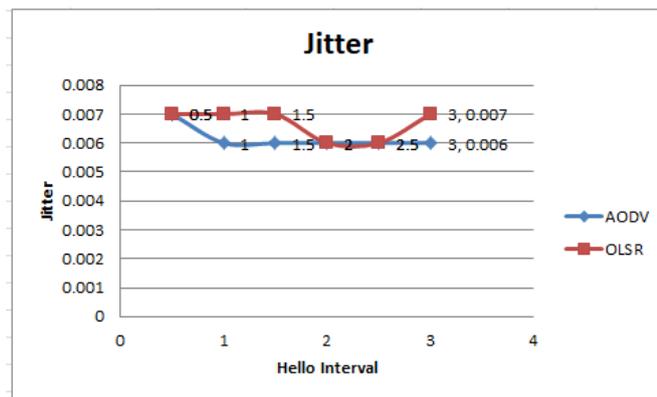


Chart-3: Jitter

Screenshots of animation



Figure-1: NetAnim animation

6. CONCLUSION-

Right now, assessed by reproduction, throughput, mean deferral, mean jitter and clog window of an impromptu system. We utilized OLSR and AODV convention and sent parcels utilizing TCP. We made recreation for various number of parcels in the system. In this way, as indicated by that we found the outcome as hi interim builds blockage in organize diminishes. Because of that the throughput of the system likewise increments.

7. REFERENCES

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