International Journal of Combined Research & Development (IJCRD)
eISSN:2321-225X;pISSN:2321-2241 Volume: 11; Issue: 4; April -2022

AN EFFICIENT TRAFFIC STREAM NETWORK FOR MULTIMEDIA COMMUNICATION WITH REDUCED PACKET LOSS

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ABSTRACT:
A traffic stream the executive's strategy, which assigns and coordinates machine type correspondence traffic streams network resources sharing inside cutting edge packet system; a tunnel passage part as a distant sensing network gateway to provide an overlaying access pathway between the devices and progressed packet system and it tends with the effect and association in the design with different segments or components of uses, administrations and terminal node gadgets, and the relative nature of service in quality (QoS) issues in the node or medium. PMIPv6 empowers neighbourhood node of a portable hub with no impact of portability related flagging. Presently, PMIPv6 has been considered for supporting portability in LTE based versatile networks. To help consistent versatility in heterogeneous portable networks, the general packet loss should be limited and to help consistent portability in heterogeneous versatile network, and the method ought to be destined to be secure. This paper aims to resolve the problems in the network resource sharing by preventing debilitating of packer transfer. This arrangement is endorsed by multiplication to exhibit future traffic stream to the current traffic stream to reduce the packet loss. pMAG will be listed in to LMA to another nMAG during handover in layer 2. Once handover is listed in, the nMAG buffers the packet and reduces the packet loss in this stream of traffic in communication network.

KEYWORDS: PMIPV6, jitter, Packet loss, Quality of Service, Quality of Experience.

1. INTRODUCTION:
In most recent couple of years, the correspondence innovation has improved with digitalization with all type of audio and video data, which pulled in nearly society towards the field specifically and furthermore it remunerating the requirement for the disseminated framework utilizing the interactive multimedia data. Mixed media correspondence handles while moves the data as discrete data like content, designs; and analogy data like audio or sound, video for correspondence frameworks through digitalize network and furthermore offers types of assistance and systems [11]. The network appraises the prerequisites of the assets in question, Compiles the start to finish delay, timing limitation and misfortune attributes, since the organization is fit to deal with a well characterize QoS. Headways and upgrades in the interactive media correspondence networks permit the client to arrange the framework according to the necessity and carry on as easy to understand, which results an affluent transmission over the correspondence organization. Indeed, even oblige the conventional information traffic and communicational information. By building up the immediate association of the information and yield transport to the correspondence organization, which can share I/O transport and reduce the expense of association [11].

The fast development of the cutting-edge correspondence and networks is bringing multimedia signal, video and audio administrations into more unavoidable conditions. An ever-increasing number of clients get to and associate with audio and video content utilizing various gadgets, like Television, Personal Computers, tablets, mobile phones and wearable gadgets. Giving things that are very different from each other Quality of Service and Experience that upholds a wide variety of interactive multimedia network node is characterized by careful analysis and judgment for the audio and video broadcasting throughout the cutting-edge remote network. Providing QoEto the clients with heterogeneous media gadgets is fundamental for audio and video broadcasting in the cutting-edge networks. Much exertion has been made to upgrade bandwidth to fulfil the dramatic increment of traffic-driven and exceptionally different equipment and gadgets. One basic prerequisite for future omnipresent conditions is the capacity to deal with the heterogeneity, like different client inclinations, display qualities, equipment and gadget capabilities, and arising intelligent modes. In this way, scientists and researchers are seriously examining, what the core heterogeneous factor in audio and video broadcasting is and how new strategies ought to

be intended for better QoE. The handover latency will be eliminated with the help of proposed PMIPv6, since the presentative convention upholds worldwide IP versatility makes the portable hub not to send or receive any packets, which increases the handover latency. It maintains the IP flexibility without venture of mobile node, and is packed in local Mobility Management.

2. RELATIVE WORK:

In this, research is engaged to build up the PMIPv6 which is utilized to overcome the handover, transmission delay and packet loss during interactive media information transmission, similar to message, sound/video. The connected works dependent on the PMIPv6 is referenced in this part,

Tae-Kook Kim et al. [14] have built up the handoff technique in versatile media correspondence with PMIPv6 for get in content conveyance organization (CDN). The versatile administration convention in the organization was called as PMIPv6. In PMIPv6, the portable hub which was by and by getting placated from one space moves into adjoining area, which can acquire its past move effectively. The convention gives numerous benefits like as upgraded the steering way of the source and transmission postpone minimization individually. Also, the strategy can be given to answer for limit the transmission delay from the computer-generated simulation (VR) and increased reality (AR) offices.

Vishal Sharma et al. [15] have presented cross-layer handover convention which depended on Media Independent Handover (MIH) with quick intermediary portable IPV for security reasons. Typically, the versatile network correspondence framework has the security issues in the field of IOT networks which was diminished with the assistance of the introduced strategy. The strategy was used to acquire low inertness through minimization of re-verification way during the between versatile access door (MAG) handovers. In the technique was examined by utilizing Validation of IPSec applications reasoning independently.

Byungjoo Park et al. [16] have built up the information streaming course streamlining strategy which was advanced the activity of transmission control convention (TCP) realignment calculation. The improvement cycle was utilized to diminish the packet scattering issue, which was created under hubs correspondence in the IoT climate to each other gadget activity. Mostly, the parcel realignment forestalled, controlled the packet traffic speed moreover improved execution of TCP was achieved with the assistance of the introduced strategy.

Md Mahedi Hassan et al. [17] have acquainted change procedure of Signal with Interference and Noise Ratio (SINR) for expectation reason. The philosophy sets up a prior affiliation subject to the versatility forecast, diminishes a chance to acquire the details, takes out onthefly parcel misfortune, and executes level and vertical handover using SINR change. Thisstrategy was to separate and evaluate the Proxy Mobile IPv6 convention over video execution.

Because of the gradual use of web, the media information transmission over private web convention gets expanded. As a result of the fast development of the remote innovation the versatile clients get expanded impressively and lead intricacy to give continuous correspondence between portable clients. In interactive media correspondence the versatile clients get influenced more than work area client due to the handover delay and QoS. Subsequently the handover in versatile correspondence ought to be eliminated as conceivable as to keep up continuous assistance particularly media information correspondence. In creators proposed an information streaming framework for staying away from information misfortune because of handover delay [16]. In creators proposed a SINR based procedure for dealing with handover and to stay away from handover delay in video transmission [17]. In creator proposed a quick handover strategy for any information transmission in IPv6. In [16] and [17] the creators concentrated to give the nature of administration and put forth an attempt to keep away from information misfortune in media information correspondence.

3. PROPOSED PMIPV6:

Generally, in the multimedia communication in PMIPv6 contains the elements such as number of mobile nodes (MN), Access network (AN), Local mobility Anchor (LMA), Mobility access Gateway (MAG), Previous Mobile Access Gateway (p-MAG) and New Mobile Access Gateway (n-MAG).

- **MN:** It is a device such as laptop, PDA, cell phone
- **LMA:** It is a home agent to the MN
- **MAG:** It is the access network to the MN
- **p-MAG:** It is the previous access network to the MN
- **n-MAG:** It is a new access network to the MN

- **AAA** – Server provides Authentication, Authorizationand Accounting

In PMIPv6, the handover latency relies upon exchanging delay, validation delay and enlistment delay and so on. In the proposed plan, the verification delay is decreased essentially when contrasted with PMIPv6 proposed in by eliminating excess flagging messages [10].

To facilitate with secure and enhanced establishment of packet delivery without loss, the MAG sends a confirmation packet consisting node identity to authentication server later productive approval from authentication server to access gateway with nodes details meanwhile authentication server establishes a connection and verify with LMA's node identity and gateway identity. As a result, LMA validates MAG from AAA sever and decreases the verification and validation process. Figure 1 explains the improvement of MN in proposed PMIPv6.

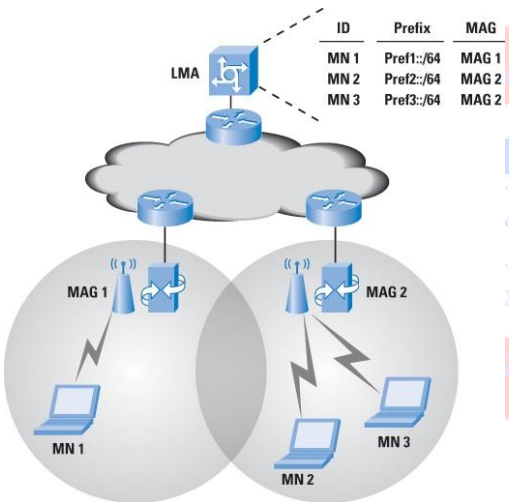

Figure 1: Network Entities in Proxy Mobile IPv6

PMIPv6 empowers IP mobility inside LMD in any portability flagging [8]. The MAG also has obligations as like Access register for certain extra capacities. It is responsible for initiation portability related flagging and monitors the development of the Mobile Node inside Localized Mobile Data. LMA functions as structured node point for certain extra abilities needed to help PMIPv6 [10]. AAA server is used to verify and approve the MN and MAG inside LMD to setup the bidirectional node for transmission between them.

3.1 Quality of Experience (QoE)

It is a measurement to assess the client's fulfilment to provide the insights towards the nature of multimedia transmission [4, 5]. As mentioned QoS arrangement strategies that underline on specialized standing for packet conveyance, QoE weights on the assurance of a base degree of nature of the ongoing video information to satisfy the end-client's needs. Thus, giving QoE ensures frequently ensures cross-layer collaborations, towards media encryption in the higher layer of OSI model to the quality-of-service arrangements and also in other, as relationship credits of interactive media sound and video data in correspondence network to decrease data overabundance while moreover to increase transport extent [4].

3.2 Operation in PMIPv6 handover process:

It is proposed to provide the versatile node-based Internet Protocol mobility board backing to a portable hub, without acquiring the support of the mobile node in any Internet Protocol portability with flagging. Network mobile substances will follow Mobile Nodes (MN's) developments and start portability flagging arrangement in expected state of directing. The mobility element LMA is liable to keeping up the expectable state of MN and the same will match the HNP. Then, MAG plays out portability to provide the benefit of a MN on the gateway to make secure transmission [12], which is used to identify MN's developments in the entire state for starting restricting enrolments to the MN-LMA.

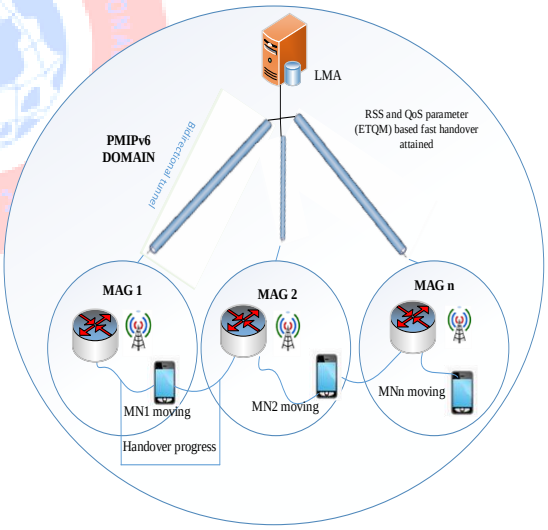

Figure 1: Multimedia Mobile communication handover process in PMIPv6

PMIPv6 DOMAIN MN1 moving MN_2 moving MN_n moving RSS and QoS parameter (ETQM) based fast handover attained Handover progress.

When a MN enters PMIPv6 area and connects to an entrance interface, the MAG on that entrance interface, in the wake of distinguishing the MN and securing its character, will decide whether the MN is approved for the organization-based versatility the board administration. PBU message will be send to acquire the present location of mobile node to MN-LMA by the MAG [22]. Once

PBU message received, LMA acknowledges that message with MN-HNP and send request to sets up a bidirectional pathway to MAG [12], which accepts acknowledgement message and sets up a bidirectional pathway to provide packet transmission through LMA for the mobile node traffic. Access gateway sends Router Advertisement messages to the mobile node on gateway with MN-HNP to facilitate connect prefix [22].

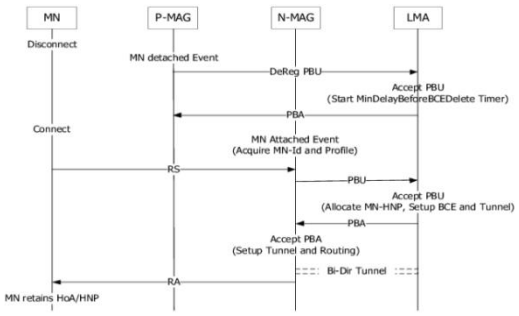

Figure 2: Operation in PMIPv6 handover process

Figure 2 explains latency traffic stream handover, which recently connected pMAG to recently joined nMAG. Subsequent to get underlying location setup in proxy mobile IPv6 area, pMAG will identify the separation of MN connection and will flag LMA to eliminate the latency and state of direction for the MN [22]. As a result, LMA after tolerating the solicitation will hang tight [12]. After identifying the new MAG (nMAG) on MN in the gateway and flags to LMA to refresh the delay state. Once flagging finished, MN keeps on accepting the RA's message contains HNP, causing to trust that until receives similar connection and utilize a similar location design on the new access interface.

3.3 Establishment of tunnel in PMIPV6:

It is proposed to provide the versatile node-based Internet Protocol mobility board backing to a MN's network area in any IP mobility related flagging. Practical parts utilized to help versatility in PMIPv6 are the PS, LMA, and MAG. PS, element that deals with the MN's verification and keeps up the MN's profile designed for the available MN [21]. LMA has extra capabilities to help PMIPv6 and to keep up accessibility to the location of MN. LMA incorporate at present enrolled MN with updated cache entry information. MAG identify the development of MS and transfer the mobility information to MN-LMA to update the MN and guarantees the address received by the MN from its home network and may transfer any place inside the mobility area to set up a tunnel for packet transmission of LMA. By this, MN trusts it is utilizing a similar connection acquired with its underlying location setup, even in the wake of changing its place of connection inside the network.

Figure 3 explains that the flagging progression with general tasks in proposed PMIPv6; the means associated with the underlying connection and handover strategy are portrayed as follows:

Step 1: In PMIPV6 area, MN goes into another LMD and identifies the connection of MN with MAG-1.

Step 2: MN-Identifier (MN-ID) play out a system to get to the validation utilizing access security conventions on gateway network.

Step 3: MAG-1 gets the MN-Identifier, LMA address (LMA-A), and arrangement mode for the upheld address through access confirmation.

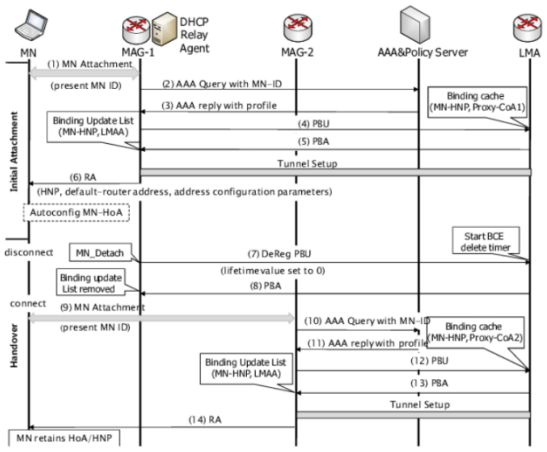

Figure 3: Signal flow in proposed PMIPv6

Step 4: MAG-1 transmits the PBU message to the Mobile node's LMA in the interest of the mobile node to refresh the LMA to acquire the present location of the MN.

Step 5: LMA doles out MN's Home Network prefix and acquire the packet entry that ties the MN's Home Network prefix to a Proxy-CoA, the location of MAG-1 subsequent to accepting update message.

Step 6: The LMA transfer the acknowledge message with MN's HNP and set up the tunnel for the bidirectional pathway to MAG-1.

Step 7: MAG-1 set up a tunnel to the LMA and add the setting to LMA and makes update List to connects MN's Home Network prefix and LMA's acknowledgement subsequent to get PBA message.

Step 8: Router Advertisement (RA) messages is sent by the MAG-1 to the MN on the gateway to promote the MN's Home Network prefix to facilitate connect prefix.

Step 9: MN arranges the address to design modes, subsequent to accepting these RA messages and finishes the location setup strategy for packet transmission.

Step 10: MAG-1 recognizes the development of MN away from its entrance connect, towards the entrance organization of MAG-2 and sends a De-enlistment update message to the LMA with life time set to 0.

Step 11: LMA acknowledge the MAG-1 and solicitation to MinDelayBeforeBCEDelete time before removes the cache entry.

Step 12: MAG-2 acquires the MN's profile utilizing identity for authentication by recognizing connection of MN and rehashes Step 1, 2 and 3.

Step 13: Within MinDelayBeforeBCEDelete stand by period, MAG-2 sends a PBU message to the MN's LMA and solicitation to refresh the current area of the MN, if that solicitation is acknowledged, the Binding Cache section isn't erased, yet rather refreshed with another worth.

Step 14: After refreshing the cache entry, LMA transmit acknowledgement to MAG-2, which transmit the RA message to MN with its Home Network prefix. MN trusts it is as yet on the home connection.

In proxy mobile IPv6 tunnelling is set up to provide the lossless packet transmission between LMA and MAG and guiding other MN's affixed to a similar access gateway. This basic tunnel reduces the traffic in network overhead. Local anchor mobility will have updated with all traffic streams through the mobile node, if the bidirectional tunnelling is successfully setting up. Ensuing to get the data, the MAG tunnel eliminates the external header and directs the data packet to mobile node [21], hence lossless packet transmission will be ensured in the network.

4. HANDOVER LATENCY

4.1 Analysis of Handover Latency:

Handover latency is perhaps the very basic elements towards the cutting edge all Internet Protocol mobile networks. This will investigate the handoff dormancy in proxy mobile IPv6 to notable host-based mobility managements protocols [24]. To work on the investigation, as an underlying advance, analyse the handover latency inside a space in light of the fact that the different handover situations are conceivable if there should be an occurrence of the between area development identified with PMIPv6.

4.2 Handover Verification and Validation process:

Initial verification and validation:

When mobile nodes are connected with domain of proxy mobile IPv6 the authentication process starts first with request message as shown in figure 4.

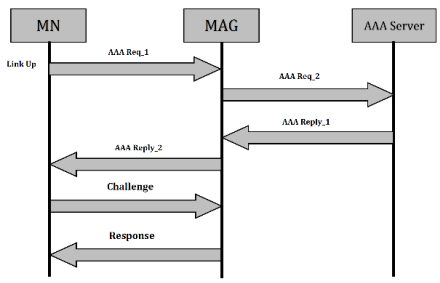

Figure 4: Initial Verification and Validation signal flow diagram.

. The initial verification and validation process signal flow diagram. First the authentication request (AAA Req_1) raised by MN is send to MAG, which forwards the authentication request (AAA Req_2) to Authentication Server. AAA Server response with authentication reply as (AAA Reply_1) to MAG. Later transfers respond to MN AAA Reply_2. Once received the reply message for authentication, Mobile nodes will rise the ticket for challenge to mobile access gateway and response received for the same to mobile node.

Final verification and validation:

Final authentication will be processed when the mobile node acquires the handover inside the same area as shown in figure 5. Authentication message is encoded message using the DES or AES encryption method with shared secret keys between the mobile access gateways. Challenge and Response message are the similar like initial validation process with the minor change of the nonce value.

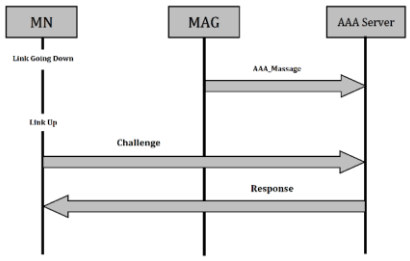

Figure 5: Final Verification and Validation signal flow diagram.

The final verification and validation process signal flow diagram, at the final mobile access gateway (MAG) transmit an authentication acknowledgement with secret shared key through encrypted algorithm (AAA_Message). Later Mobile node sends the challenge to authentication server and gets the response from the same authentication server.

4.3 Handover Latency in PMIPv6 and proposed PMIPv6:

Here the verification, when LMD listed the MN for the first time and determine the latency by adding the verification delay from authentication server by restricting store section of MAG and LMA, and delays the transmission of data packet [13]. To be listed in, 2 messages of PBU and PBA are communicated. For verification, all out 4 parcels are communicated, two packets for validation demand and two verification response packets. Hence latency may be addressed as follows:

$$T_{proxy} = T_{auth} + T_{reg} + TNR + TRA \quad (1)$$

$$T_{reg} = 2TAN \quad (2)$$

$$T_{auth} = 2 * 2Ta \quad (3)$$

Now equation (1) becomes

$$T_{proxy} = 4Ta + 2TAN + TNR + TRA \quad (4)$$

Handover latency in proposed PMIPv6: It decreases verification and validation delay. Two packets consist of update and acknowledged messages are sent for enrolment and three packets includes one packet of validation request and two of validation response to MAG to LMA. Finally, local mobility device handover latency may be addressed as follows:

$$T_{Proposed\text{-}Proxy} = T_{auth} + T_{reg} + TNR + TRA \quad (5)$$

$$T_{reg} = TAN \quad (6)$$

$$T_{auth} = 2Ta \quad (7)$$

Now equation (5) becomes

$$T_{Proposed\text{-}Proxy} = 2Ta + TAM + TMR + TRA \quad (8)$$

5. RESULT AND DISCUSSIONS:

5.1 Packet Loss

The lacking of information packet in a network whilst it's far over-burden and cannot well known extra packets at a given instant because of handover latency. The loss is typically cushioned for overflow on the end-frameworks. The support, which is a transitory for statistics this is being sending from an outer node. Handover embrace connect exchanging, which may not be entirely organized with quick handover latency. Consequently, packets may show up at the nMAG before the MN which can build up its connection.These record packets could be lost except if they're buffered via the nMAG. Likewise, assuming the MN ties to the nMAG and, sends a PBU message, statistics packet displaying up at the pMAG until the PBU is prepared might be lost except if they're supported.

5.2 Scenario of Packet Loss

Packets may show up at nMAG before the MN can build up its connection. These data packets will be lost except if they are cradled by the nMAG. Assuming MN appends to nMAG and, sends a PBU message, data packet showing up at pMAG until the PBU are cycles will be lost except if they are cushioned.

5.3 Reduction of Packet Loss

To decrease Packet Loss, tunnelling is set up in between the pMAG and nMAG before MN getting exchange from the nMAG and is thoughtful to get every packet sent through the old way before MN accepting the parcels from the new way.

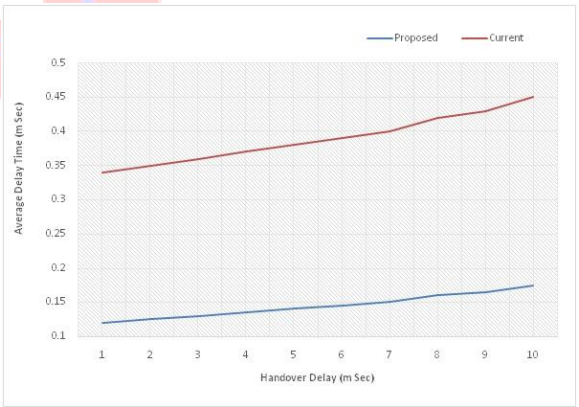

Figure 6: Average Handover delay

Utilizing last packet pointer strategy, the nMAG changes to LI when known to every one of the packets from pMAG in the after effect of node test system. Consequenceof follow document shows that there is no packets loss. All sent packets from respective hub to portable hubs were delivered without loss.

5.4 Investigation of Packet Loss Ratio

The out of order packets issues are addressed in two ways for the data packets in the Mobile Node.

The estimations are measured between the amounts of out of order packets with sending rate in kbps.

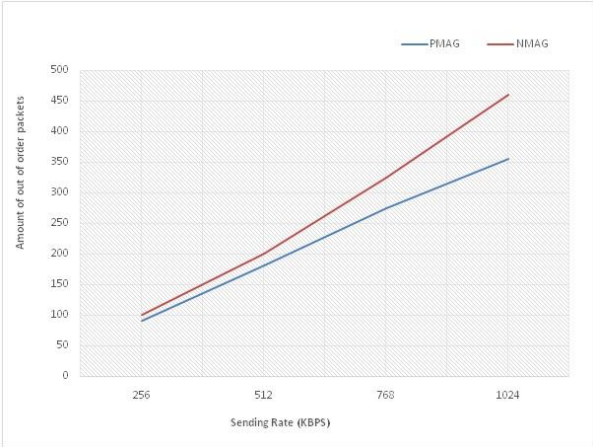

Figure 7: Out of order packets

The measure of out of order packets in pMAG and nMAG has been shown in the graph. The technique of last packet pointer method had set up in order to reduce loss of data packet issue. LPI is used to stay away from packet loss on the hour of handover delay time.

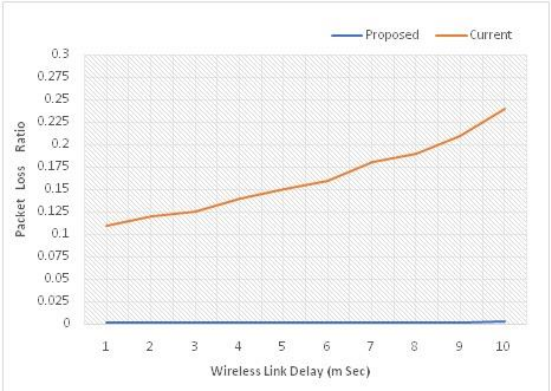

Figure 8: Ratio of Packet Loss

This studied estimation shows that, reduced number of packet loss on the hour of handover latency of that reproduction result.

6. CONCLUSION

For consistent versatility in IPv6 network, various conventions are proposed by scientists and researchers. In MIPv6, the host-based portability the executive convention and in PMIPV6, the subsequent conventions have higher flagging overhead than the organization-based versatility convention. Versatile Network innovation is progressively being utilized by every single individual on the communication network around the worldwide. In Mobile node paradigm, a successful transmission of packets in portable network is needed for accomplishing loss less transmission. Be that as it may, essential PMIPv6 was not totally secure. The proposed PMIPv6 shows better execution as far as handover latency for packet loss investigation. This work summarizes and explains the strategy for keeping away from packet loss and limiting delay at the hour of handover.

7. FUTURE ENHANCEMENT:

The enhancement is acknowledged as far as loadon LMA, size of mobility latency messages and number of mobile nodes to be refresh in individuals from a mobile network and handover time. The packetloss has diminished because of the reduction in the handoff latency still packet loss might be decreased by utilizing predictive handoff approach by permitting the packet for buffering in the MAGs and sending them to the new MAG. Also, the analysis of the performance metrics of handover delay, jitter, packet loss and SINR are need to study to proves the efficiency and accuracy of the proposed method and need tocompare with the existence proxy mobile IPv6 to prove the efficiency of the proposed method.

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