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Cloud Service for Best Gateway in VANET

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Abstract— Cloud computing is widely recognized as next generation computing paradigm, analyzing the possible way's of providing the cloud service to mobile network users using 3G, WiFi, and satellite internet technologies aided undertaking this project. The main purpose of this paper is to grand cloud service to the vehicular ad-hoc network users efficiently, providing enough storage space, increasing the computational power of the users, and increasing the speed of internet connectivity to the users. The ultimate aim of this paper is to discover the best gateway to provide cloud service to the Vehicular ad-hoc network users, by increasing connectivity, decreasing the packet loss, increasing the packet delivery rate

Keywords— VANET, 3G, WiFi, Satellite, Internet, Gateway, Cloud.

I. INTRODUCTION

To determine the appropriate internet gateway to provide cloud service to the VANET users is the significant task for the cloud server. The vehicle getting cloud service hand over's the job of discovering the finest gateway to the cloud server, the cloud server finds the eminent gateway by sending request to the next hop gateway, if the next hop gateway replies with negative acknowledgement the cloud server as to continue this same process by sending request to some other gateway. In VANET using the latest technologies like 3G, WiFi or WiMax and Satellite internet connection proposes the possible ways of providing cloud service to the users. Selecting the best gateway depends on the location, speed and direction of the vehicle. The objective of this paper is to provide cloud service to enhance connectivity to the vehicle ad-hoc network (VANET) users in different geographical location to increase packet delivery rate, decrease the amount of packet loss.

II. EXISTING SYSTEM

VANET applications are widely used technology providing internet [4] to VANET supports various application, gives entertainment and infotainment to the VANET users which can be achieved through Vehicle to infrastructure communication.

Cloud computing is known as next generation computing paradigm [2]. Internet [1] acts as a channel for supplying the cloud resources to the users. It is necessary to continuously connect to the internet to acquire cloud service all over the place. Internet access in VANET is provided through road side gateway. It is difficult to get stable internet connection through road side due to high mobility and changing network topology. The mobile gateway [6] helps in providing stable internet connection to the vehicle under mobility condition. If the vehicle moves to out of coverage areas like terrains or hills where there is no infrastructure or mobile gateways.

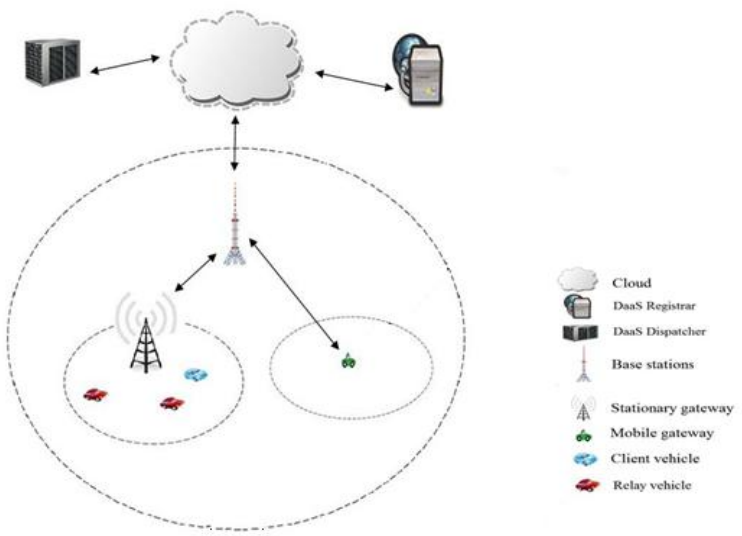

Fig. 1 Existing system

III. PROPOSED SYSTEM

Satellite link [11] is introduced in this proposed project to provide internet connection to vehicle in totally disconnected areas. The stable internet connection in VANET is remarkably necessary for providing cloud service to the VANET users. In this paper an optimized gateway discovery scheme is introduced to overcome the problem of discovering the gateways in various zones to improve connectivity, lessens the packet loss, increase the packet delivery rate.

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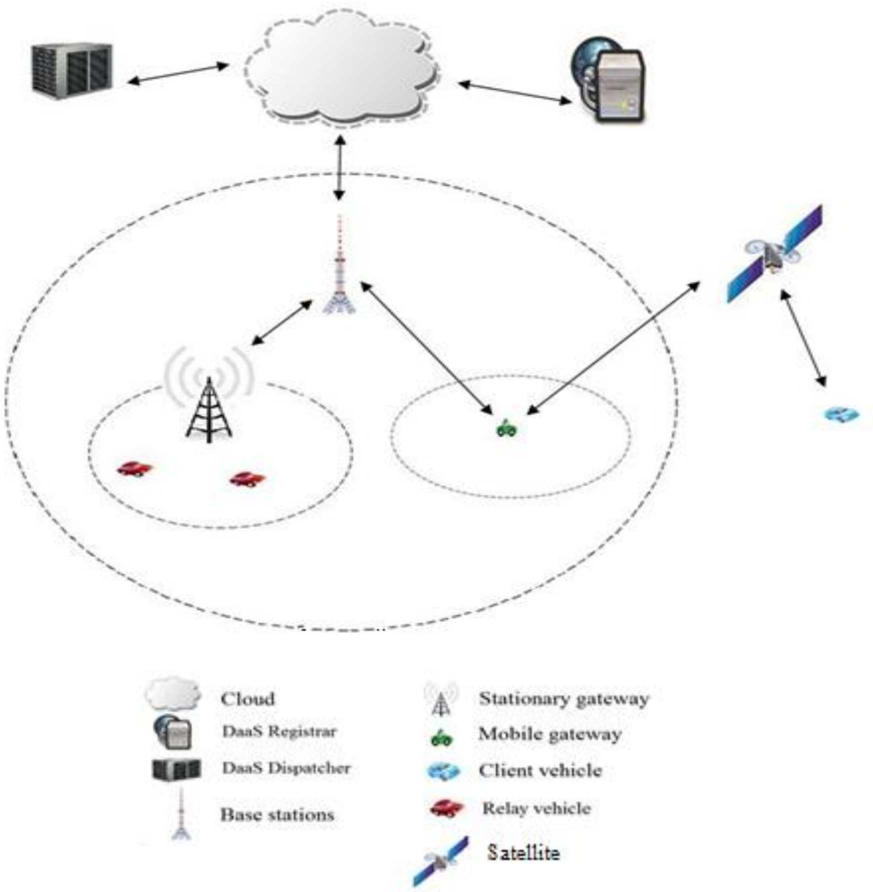

Fig. 2 Architecture of the Proposed system

A. Role of Cloud Server

Cloud server which provides the cloud service, the server registers its service with DaaS(Discovery as a Service) Registrar, which maintains the information of various gateways. DaaS(Discovery as a Service) Dispatcher is responsible for discovering and dispatching the gateway for client vehicles

B. Gateway types

There are two types of gateway they stationary gateway (e.g WiFi, Wi-Max or Base Stations(BS) and mobile gateway (e.g the vehicle that directly connects to the internet)

C. Gateway registration process

The gateway registers its own state information with the DaaS Registrar by sending a Register message. The DaaS Registrar records related state information in related entry in the database, namely, the Gateway pool; and sends back a GID (Gateway ID) to the registering gateway The gateway updates periodically its state by sending a Renew message to the DaaS Registrar.

D. Determining the proper Gateway

The client vehicle sends a REQ-DaaS message to currently serving gateway Current gateway forwards the REQ-DaaS message to the DaaS Dispatcher. The DaaS Dispatcher queries the DaaS Registrar about qualified gateways by sending a Query message. The DaaS Registrar sends back the list of candidate gateways, namely, the Candidate list, to the DaaS

Dispatcher after retrieving related information of the qualified gateways from the Gateway pool, DaaS Dispatcher selects the gateway with longest link lifetime among the gateways in the Candidate list as the next-hop gateway. The DaaS Dispatcher sends Reserve message to the next-hop candidate gateway for reserving needed resources If locally available resources can meet the QoS requirements of the CV, then, the candidate gateway sends back a positive ACK message to the DaaS Dispatcher. Otherwise, the candidate gateway sends back a negative ACK message to the DaaS Dispatcher. If the candidate gateway replies a positive ACK then the DaaS Dispatcher sends a positive REQ-DaaS message to current gateway. Otherwise, a negative REQ-DaaS is sent to current gateway. Current gateway forwards the REQ-DaaS message to the requesting client vehicle.

E. Pseudo code for the proposed system

```
Begin
Set node configuration values
Set values for global variables
Create instance of the NS simulator
Set addressing type
Set file for trace files, NAM file, Bandwidth, packet loss
Set topology
Create node, node label and assign nodes HA address
Set node position
Mobile Node movement
If record function is called
   Assign time after which the packet delay should be recorded again
   Record number of bytes has been received by the traffic sinks
   pd0= bytes received
   Calculate the Packet delay (in MBit/sec) and write it to the files
   Now=pd0/time*8/1000000
   Reschedule the process until the simulation ends
End if
Create UDP source and attach it to nodes
Create CBR traffic
Connect Source node and CBR traffic
Begin
Start the traffic flow
Cycle 1:
Cloud sends to BS
BS sends to SG
SG sends to CV
SG sends to SAT
SAT sends to CV
Cycle 2:
Cloud sends to BS
BS sends to MG
MG sends to SAT
SAT sends to CV
Cloud sends to BS
BS sends to MG
MG sends to CV
End
Assigning node initial position
If stop function is called
          End the simulation
          Write trace file and NAM file
          Close trace file and NAM file
          Execute NAM
          Move packet loss info into loss file
          Exit
End if
Start the ns simulation
End
```

IV. EXPERIMENTAL SETUP

A. General constraints in experimental set up

- Operating system should be Linux to run NS2.
- User should know TCL & C++ languages.

- Since mobile node, router is wireless there is no acknowledgment for UDP packets.
- The protocol uses the UDP CBR packets to achieve real life scenario.

B. Snapshots of the proposed system

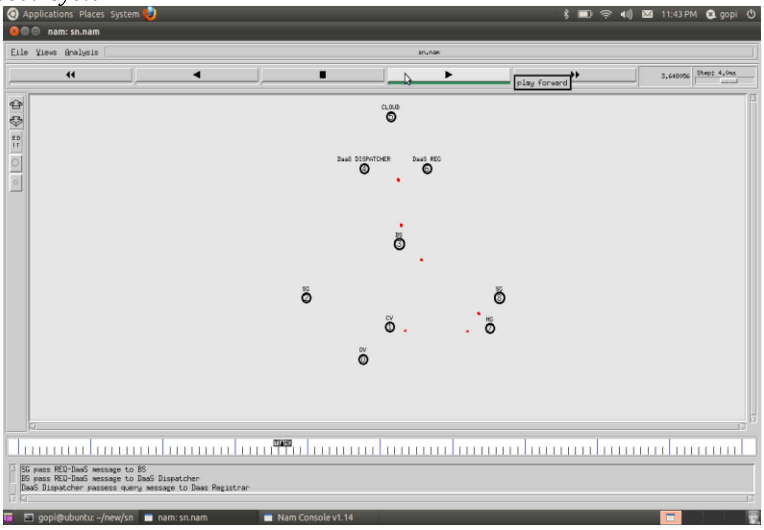

Fig. 3 Existing scenario 1- Cloud service to CV via SG

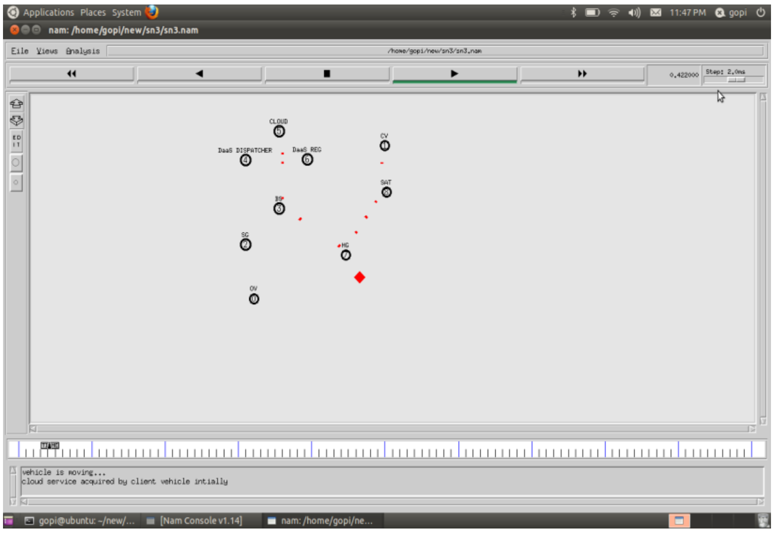

Fig. 4 Existing scenario 1- Cloud service to CV via MG

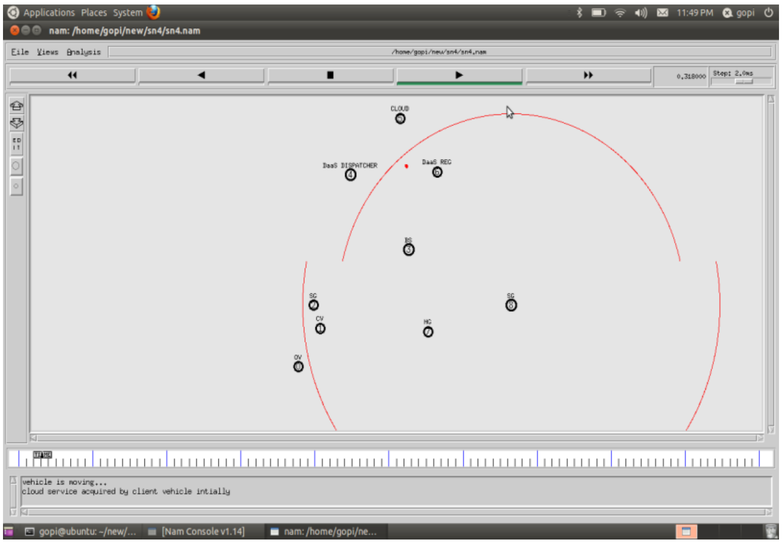

Fig. 5 Existing scenario 2- CV within Coverage area

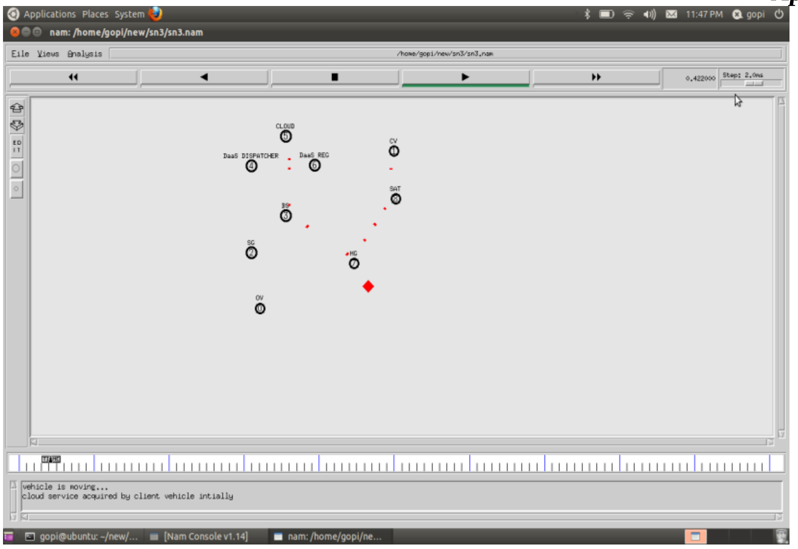

Fig. 6 Proposed scenario 2- CV enters into coverage area getting service via Satellite CV

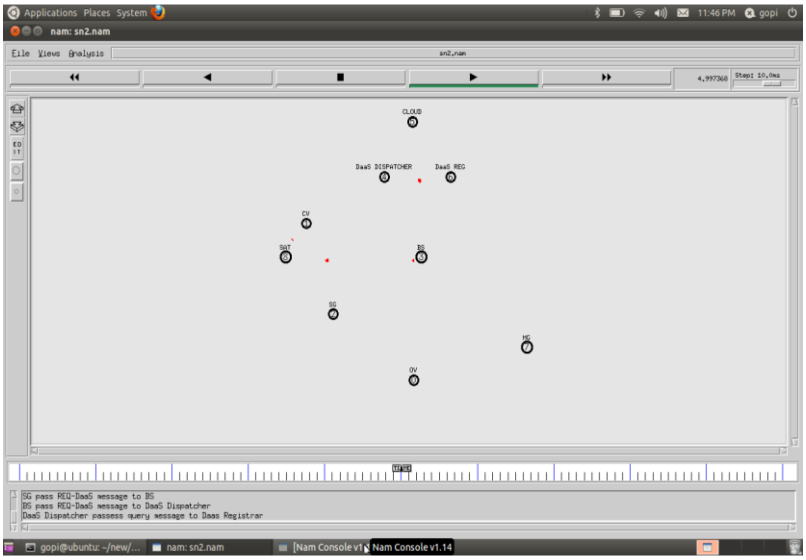

Fig. 7 Proposed scenario 2- CV gets service via satellite in the out of coverage area

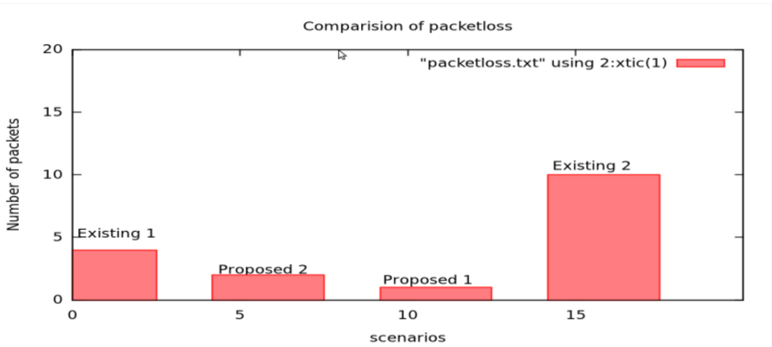

Fig. 8 Packet loss comparison

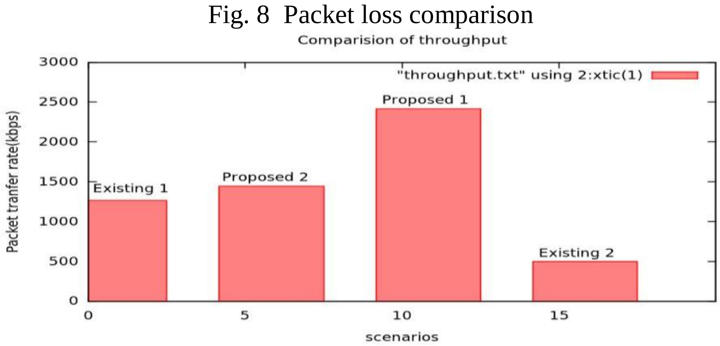

Fig. 9 Throughput comparison

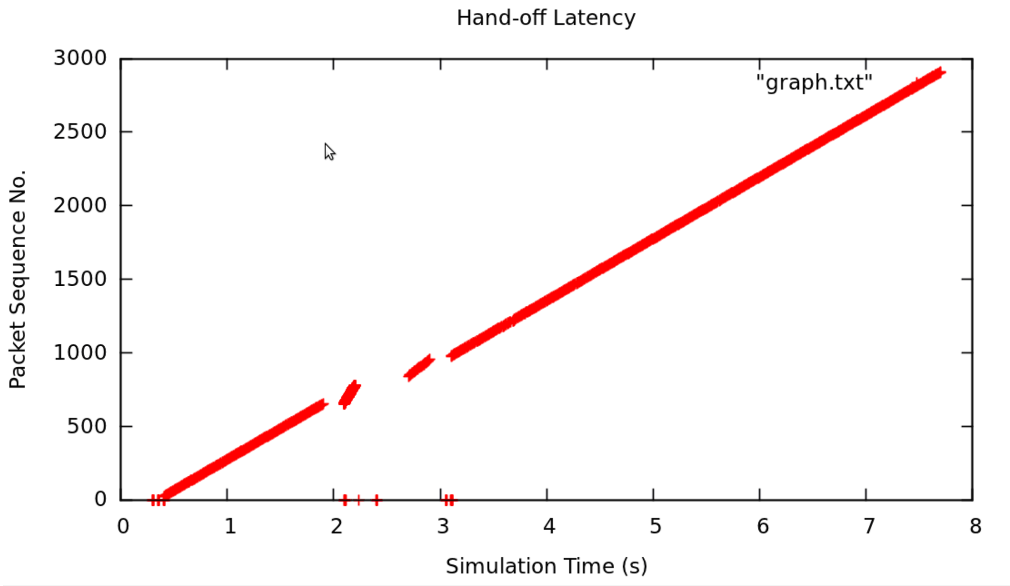

Fig. 10 Hand-off latency Existing scenario 1

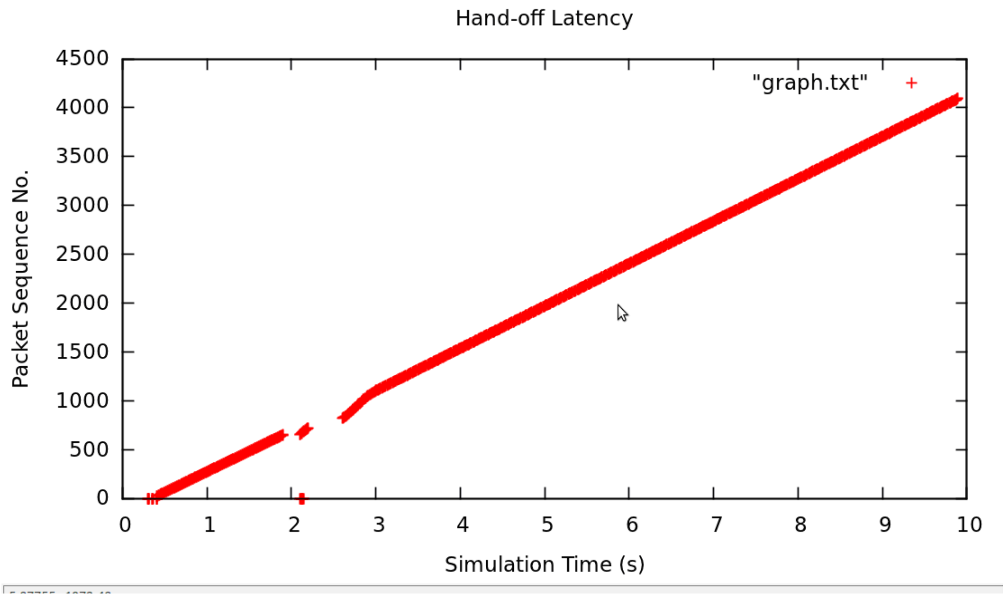

Fig. 11 Hand-off latency Existing scenario 2

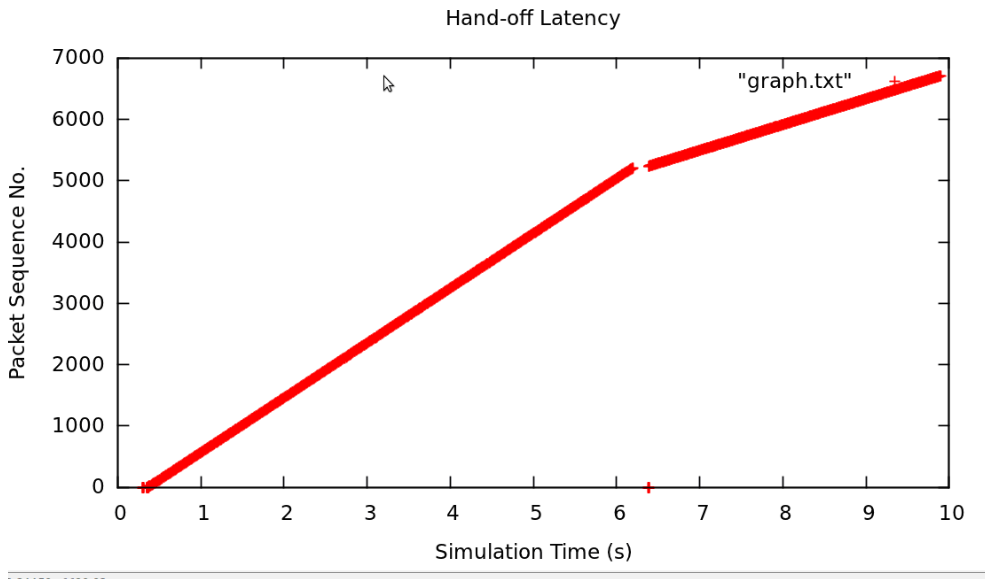

Fig. 12 Hand-off latency Proposed scenario 1

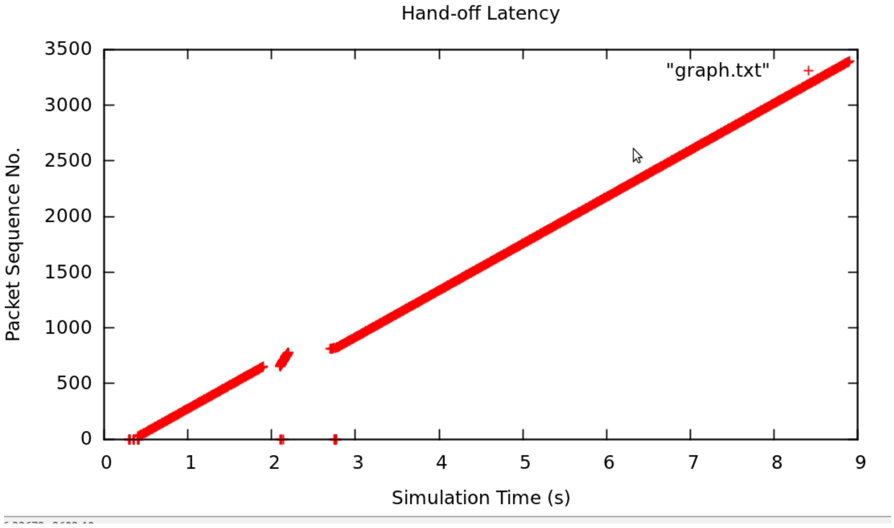

Fig. 13 Hand-off latency Proposed scenario 2

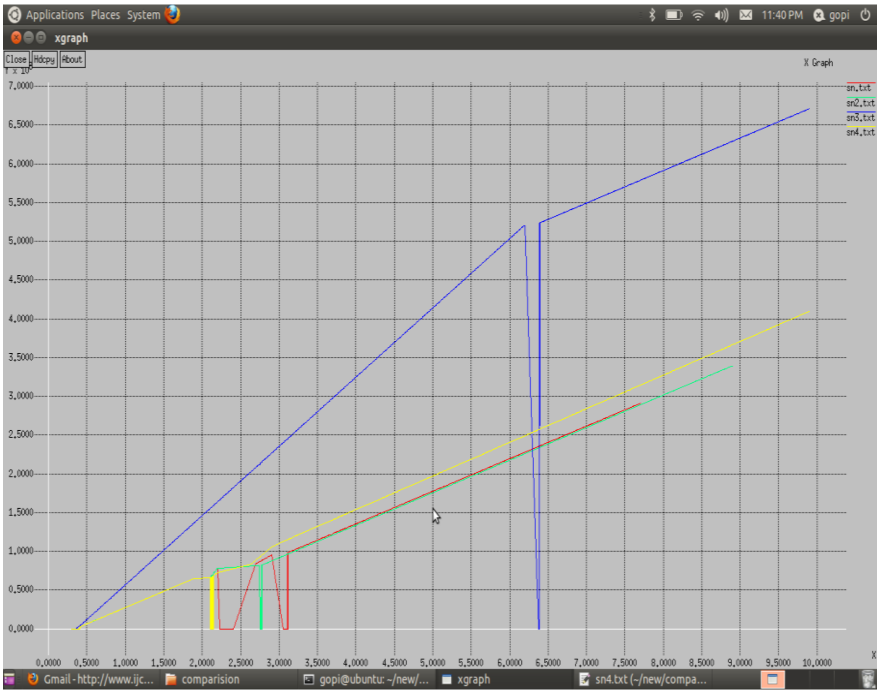

Fig. 14 Hand-off latency comparisons

V. CONCLUSIONS

In this proposed, optimized gateway discovery mechanism is proposed to Vehicular Ad-hoc Network, using Satellite Link. The server selects the gateway based on the location, speed of the vehicle, and stable connectivity. In case of the changing topology the server selects the gateway with the longest link time. If there is no network to connect where vehicle wants to get the service, the server chooses Satellite Link to provide the cloud service. As shown in the simulation result the hand off latency has been reduced, increased packet delivery rate and reduced packet loss, while acquiring cloud service in VANETs.

REFERENCES

[1] Yen-Wen Lin, Jie-Min Shen, and Hao-jun Weng, Cloud-Assisted Gateway Discovery for Vehicular ad Hoc Networks, Taichung, Taiwan, R.O.C.

[2] Yen-Wen Lin, Jie-Min Shen, and Hao-Chun Weng, *Gateway Discovery in VANET Cloud*, Taichung, Taiwan, R.O.C .

[3] H. Moustafa, and Y.Zhang, Networks-Techniques, Standards, and Applications, CRC Press, 2009.

[4] A. Iera, A. Molinaro, S.polito, and G.ruggeri, A Multi-Layer Cooperation Framework for QoS-Aware Internet Access in VANETs, 2009.

[5] A.Benslimane, S.Barghi, and C.Assi, An Efficient Routing Protocol for Connecting Vehicular Networks to the Internet, Pervasive and Mobile Computing, 2011.

[6] V. Namboodiri, M.Agarwal, and L. Gao, A Study on the Feasibility of Mobile Gateways for Vehicular Ad Hoc Networks, 2004.

[7] W.Su, S.J.Lee, and M.Gerla, Mobility Prediction and Routing in Ad Hoc Wireless Networks, 2011.
[8] A. Benslimane, T. Taleb, and R.Sivaraj, Dynamic Clustering-Based Adaptive Mobile Gateway Management in Integerated VANET-3G Heterogeneous Wireless Networks, 2011.
[9] NS2, available at: NS2-www.isi.edu/nsnam/ns.
[10] Ali E.Atia, "Ka Band Satellite System Architecture for Local Loop Internet Access", Orbital Science Corporation German Town, MD20874.
[11] A.M Vegni, C.Vegni, and T.D.C .Little," Oppurtunistic Vehicular Networks by Satellite Links for Safety Applications.

