

PERFORMANCE EVALUATION OF AOMDV-IOT PROTOCOL FOR MANET

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Abstract: *Internet of things (IoT) comprises connecting networks and all the procedure which job based on our setting, and can generate our life safer, faster and healthier. Today IOT is being employed all over the place which is of individual anxiety like smart environment, Smart city, security and residence computerization and healthcare. Designing of steering protocol for IoT is a vital ingredient in the lessons of IoT. The IoT is a fresh conception in IT field, but the do research of routing protocol for IOT is immobile. We have enhanced the AOMDV algorithm through optimizing the protocol, such as we united together routing table and internet connecting table. In this task, we have intended a routing method that can take as routing destination not just like nodes. This type of enhancement is more suitable for the use in IOT, by connecting to the internet. NS-2 simulator is designed for presentation estimate of proposed AOMDV-IOT. Simulation results showed that AOMDV-IOT achieves superior results in packet delivery ratio, average end-to-end delay, through-put and consumed energy.*

Index Terms- *Internet of Things, Machine-to-Machine, Electronic Product Code, Network Simulator, Distance Vector*

I. INTRODUCTION

The term IOT has been a 16 year old theory. But the definite plan of associated strategy had been about longer. Rear then, the method was frequently called “embedded internet” or “pervasive computing”. But the definite expression “Internet of things” was invented by KEVIN ASHTON in the year 1999 through his work. Ashton who was functioning in provides chain optimization, necessary to draw senior management’s concentration to a new stimulating technology called RFID. The mean is to link things to everyone and put up a series of command among them, such as connecting Personal Digital Assistant devices to house appliance in a master-slave connection to create our life easier as well as linking home application to make coffee machines, alter car seats, etc.

The IOT stress: (1) a common accepting of the situation of its user and their appliances, (2) software architectures and invasive communication networks to process and state the related information to where it is applicable, and (3) the analytics apparatus in the IOT that aspire for self-governing and smart behavior[1]. The IOT is, series from an informational system that let the look-up of in order about real-world material by returns of a exceptional ID call Electronic Product Code and a decision mechanism (ONS), to a network of sensors, actuators and autonomous matteract together with every one openly Machine-to-machine (M2M) communication [2].

From a long perspective, the improvement tendency of the IOT consists three steps: embedded intelligence, connectivity, interaction. Firstly, we have implanted intelligences which can do actions automatically. There already have been many applications, for example: the RFID tag implanted in food can record the information about the food and we can get the information by using a RFID reader [19].

IOT is proved to be a rising technological improvement. In the present situation, it is now probable that a helmet of a two wheels equipment can assist with a car for avoiding collision. Connected toothbrush can now check and make one’s experience pleasing .A three dimensional sensor of the electric brush can attach with Smartphone apps and give real time response to the person. Many scopes will be created for technology companies to release offerings as per the behavior of consumers. It may so occur that Netflix can recognize when a person is distressing and alone by monitoring the stylish watch, smart thermostat and in-home camera. Therefore, Netflix may tender a movie to contrast the atmosphere. In consumer electronics demo in Los Vegas, Samsung learned that the company would devote 100 million dollar for progress of IoT. The company will also endorse an open technology ecosystem for facilitating the convention of IOT [20].

Section 2 present related work in detail and Section 3 and 4 present’s algorithm for the proposed system and results respectively and section 5 conclude the thesis with prospect work.

II. PROPOSED WORK

In this study we have projected a protocol based on AOMDV to get better the routing of AOMDV for IOT. It is modified AOMDV to settle in with the usage in IOT. Our main purpose is to find and make the association between nodes and internet efficiently. The routing procedure will locate the mainly appropriate linkage mechanically, and record other links as back up. If a node want to produce a link to the internet, it should first check its internet connecting table, if the information there is valid, the node will choose the node which hops count is the lowest, or start the routing finding process. Then it will take the discovered node as destination node to send message

In this paper we are implementing AOMDV-IOT protocol using network simulator (NS2.34) on ubuntu 10.04. AOMDV and AOMDV-IOT with 25, 50 nodes are considered.

Network Simulator-2 (NS2) is a distinct event network simulator that plays anchief role in network research and progress. To make use of NAM, you include to primary make a trace file that contains topological data like nodes, links and packet traces. One time the trace file is generate, NAM will examine it, construct a topology, pop up a window, do the sketch if required, and then gap at the instance of the initial packet in the sketch out file. NAM provides systematize over lots of aspect of simulation from first to last its user interface, and do simulation by resources of the next building blocks: node, link, queue, packet, agent and monitor.

Routing: distance vector (DV), link state (LS), and multicast
 Transport protocols: TCP, UDP, RTP and SCTP
 Traffic sources: WEB, FTP, telnet, CBR, and Stochastic
 Queuing disciplines: Drop-Tail, RED, FQ, SFQ, and DRR
 QoS: IntServ and Diffserv emulation
Wireless
 Ad hoc routing (AODV, DSDV) and mobile IP
 Directed diffusion, and sensor-MAC

TCL (Tool Command Language): TCL is abbreviated form of Tool Command Language. TCL is embeddable, multi-platform scripting language, extensible, developed in the University of California, Berkeley. It is an agreement of a scripting speech and its own predictor that get rooted to the function. TCL was urbanized at first for UNIX. It was after that ported to window, DOS, OS/2, and Mac OSX. TCL is much similar to extra unix case language like Bourne Shell (Sh), the C Shell (csh), the Korn Shell (sh). It aim at giving that capability for program to cooperate with further program and also for performing arts as an embeddable interpreter. However, the unique aim was to enable programs to interrelate, you can find full-fledged applications printed in TCL/Tk.

TCL Command: TCL control is essentially a record of terms, with the primary report instead of the rule to be executed. After that terms stand for the arguments. In arrange to collection the terms into a on its own dispute, we enclose multiple words with "" or {}.

Command: command arg1 arg2 arg3...

Command is the forename of built-in rule or Tcl procedure. Space and tabs separate command and arguments, eol and; end commands.

Grouping: string within {...} or "... " are combined into particular argument

Substitution: rate of changeable or nested command are in use

Tcl does group than exchange and finally call command.

Procedures

Proc fact {n} {

Set result 1

While {\$n>1} {

Set result [expr \$result * \$n]

Set [expr \$n -1]

}

return \$result

}

Network Animator (Nam): NAM interpret a trace file contain time-indexed set-up actions to animate network transfer in quite a few dissimilar conduct. Typically this trace is generated from an ns simulation, but it can to be generated by processing data taken from a live network to produce a NAM trace. NAM usually runs off line with the trace stored on disk, but it be able to play traces from a running program through a UNIX pipe. A NAM input file contains all information wanted for the simulation: both the static system layout and dynamic events such as package arrivals, going away and drops and link failures, wireless networking simulations comprise node location and movement. A network animator provides packed-level moving picture and protocol-specific graph to assist out the plan and debugging of new network protocols. Agreeable data from network simulators or survive network, NAM was one of the primary tools to give common purpose, packet level network animation. NAM now integrate conventional time-event plot of practice measures and set-up organize capacity.

AWK: AWK is a high level programming encoding language. It is very commanding and particularly planned for text dispensation. It's given name is resulting from the relatives' names of its authors – Alfred Aho, Brian Kernighan, and Peter Weinberger. The account of AWK that GNU/Linux distributes is written and maintain by the Free Software Foundation; it is frequently referred to as GNU AWK.

Uses of AWK

Many of tasks can be completed with AWK. Scheduled under be now a tiny sum of them:

- Text processing
- Producing formatted text reports
- Performing arithmetic operations
- Performing string operations, and many more.

III. ALGORITHM

1. Start the path examines by the control signal with a new sequence number from the source to the destination.
2. Reset the total energy in the lane to zero.
3. in each of the navigated node,
 - 3.1 Mark an entry or update the entrance in the routing table, for every source destination combination, for each of the node traversed provided,
 - 3.1.1 The route to be examine is a fresh one with a fresh series number then,
 - 3.1.2 With minimum hop count from individuals originate so far connecting the corresponding sources destination combinations then,(go to step 3.1.3)
 - 3.1.3 If the total energy computed now is larger than the already computed total energy which is stored in the routing table, then, (go to step 3.1.4)
 - 3.1.4 If the above three circumstances are satisfied, inform the progression if it is a new one, update the hop count if it is negligible, bring up to date the total energy value if it most along the path with minimum hop count, then, (go to step 3.1.5)
 - 3.1.5 For all entrance ready in the routing table a repeal routing table entrance is complete for the node from wherever the signal is obtain.
 - 3.1.6 Else go to step 3.2
 - 3.2 Otherwise drop the control packet.

4. This procedure is repetitive until it reaches the target to fall the control packet. If the hop count is more than the time to live (the maximum hop count possible for the network), then drop the packet as there is no route from this node to the destination. When the packet touches the destination additional control packet is started in the repeal track from the destination to the source.
5. The node navigates the path as specified in the reverse routing table to touch the destination.
6. If numerous paths exist up to the source from the destination, the most efficient one with extreme residual reverse lane is chosen. Once the path with highest total energy for pathway organization is chosen,
7. Data transmission starts from the source to the destination.
8. in each node beside the path,
- 8.1 Forward the data until it touches the destination from the source.
9. This procedure is repetitive until there is a node or path failure upon which an original lane search is invoked with total energy initialized to 0.
10. The procedure of examining for a new path lasts until there are no more paths obtainable from the starting place to the end.

IV. RESULTS

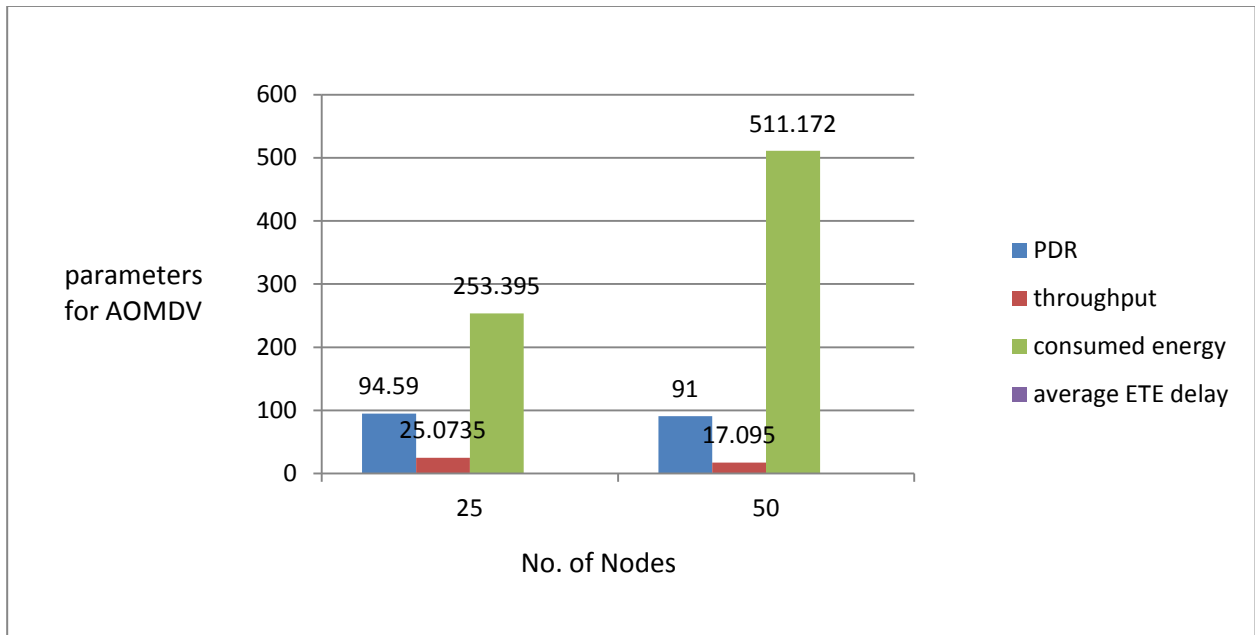


Figure 4.1: Result Parameters for AOMDV

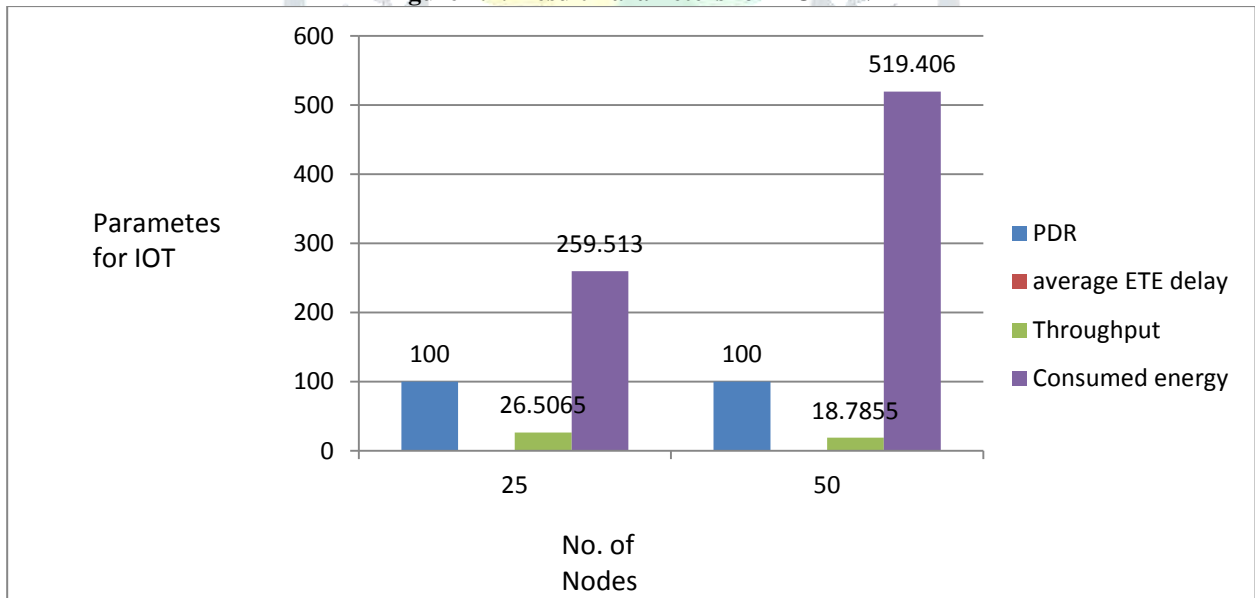


Figure 4.2: Result Parameters for IOT

Table 4.1 : Parameter metrics for AOMDV

No. of Nodes	PDR	Average ETE delay	Throughput	Consumed energy
25	94.59	0.04717	25.0735	253.395
50	91.00	0.02483	17.0950	511.172

```

Performance Metrics
Total Packets Sent           :           53013
Total Packets Received       :           50147
Total Packets Dropped        :           7475
Packet Delivery Ratio        :           94.59
Throughput of the network(KBps) :           25.0735
Average End to End Delay    :0.047170916 ms
pc@pc-VirtualBox:~/mobiwan$

1480 simulation seconds
1490 simulation seconds
pc@pc-VirtualBox:~/Preeti$ awk -f energy.awk trace.tr
Total Consumed Energy      253.395
pc@pc-VirtualBox:~/Preeti$

```

Figure 4.3 Result of Aomdv and consumed energy for node (n=25)

Table 4.2: Parameter metrics for IOT

No. of Nodes	PDR	Average ETE delay	Throughput	Consumed energy
25	100.00	0.001659	26.5065	259.513
50	100.00	0.001686	18.7855	519.406

```

Performance Metrics
Total Packets Sent           :           53013
Total Packets Received       :           53013
Total Packets Dropped        :           0
Packet Delivery Ratio        :           100.00
Throughput of the network(KBps) :           26.5065
Average End to End Delay    :0.001659730 ms
Metric values are correct
pc@pc-VirtualBox:~/mobiwan$

pc@pc-VirtualBox:~$ cd Preeti
pc@pc-VirtualBox:~/Preeti$ gedit energy.awk
pc@pc-VirtualBox:~/Preeti$ gedit aomdv.tcl
pc@pc-VirtualBox:~/Preeti$ awk -f energy.awk trace.tr
Total Consumed Energy      259.513
pc@pc-VirtualBox:~/Preeti$

```

Figure4.4: Result of AOMDV-IOT and consumed energy for node (n=25)

V. CONCLUSION AND FUTURE SCOPE

IOT has the widespread future with providing applications with many aids to users. Internet of Things has prominent potential of benefits over the worldwide. As every new technology has some challenges, IOT has also some challenges. The present has discussed AOMDV routing procedure for IOT. Herewe enhanced the algorithm throughout optimizing the protocol, such as routing table and internet connecting table be shared into one. Application alarmed study is desirable for different industrial application in which IOT be capable of to be used in sort to initiate a latest technological revolution. New security experiments and utilize of lightweight cryptographic protocol must to be considered further.

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