Improvising RAODV Routing Protocol For Overcoming The Link Break Issue In Manet

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Abstract- *In mobile ad hoc networks, there is no centralized infrastructure to monitor or allocate the resources used by the mobile nodes. The absence of any central coordinator makes the routing a complex one compared to cellular or wired networks. Here in MANET medium of communication is air. The Ad hoc On Demand Distance Vector (AODV) routing protocol is designed for ad hoc mobile devices. AODV uses an on demand approach for finding routes. AODV and most of the on demand ad hoc routing protocols use single route reply along the reverse path. Due to rapid changes of topology the route reply may not arrive to the source node resulting in sending several route request messages and degrading the performance of the routing protocol. The extended AODV called Reverse Ad Hoc On Demand Distance Vector routing (R-AODV) protocol uses a reverse route discovery mechanism (R-RREQ) and performs well in terms of mobility when compared to AODV. Proposed Reverse Ad hoc On demand Distance Vector algorithm to reduce the link breakage scheme for mobile ad hoc networks. Proposed approach will reduce packet loss and finds optimized route by taking into consideration of received signal strength (RSS) parameter. The performance analysis and simulation will be carried out to evaluate network performance using network simulator NS-2 based on the quantitative basic parameters like Packet Delivery Ratio, throughput, end-to-end delay along with various traffic models and mobility scenarios.*

Keywords- MANET, Ad hoc On Demand Distance Vector (AODV), Reverse Ad Hoc On Demand Distance Vector routing (R-AODV), Received signal strength (RSS), reduce link breakage, Throughput, Packet Delivery Ratio

I. INTRODUCTION

Wireless Network correspondence is the exchange of data and information between two or more points that are not joined or connected by an electrical conductor.

The most widely recognized remote innovations utilization radio. With radio waves separations can be short, for example, a couple meters or to the extent thousands or even a great many kilometres for profound space radio correspondences. It includes different sorts of altered, versatile, and compact applications, including two way radios, cell phones, personal digital assistants (PDAs), and remote systems administration. Different cases of uses of radio remote innovation incorporate GPS units, carport entryway openers, remote PC mice, consoles and headsets, earphones, radio beneficiaries, satellite TV, telecast TV, cordless phones, garage door openers.

Fairly less normal routines for accomplishing remote correspondences incorporate the utilization of other electromagnetic remote technologies, for example, light, magnetic, or electric fields or the use of sound.

Wireless means transmitting signals utilizing radio waves as the medium rather than wires. Remote advancements are utilized for undertakings as straightforward as exchanging off the TV or as complex as supplying the sales force with data from a mechanized venture application while in the field. Presently cordless consoles and mice, PDAs and computerized and PDAs have turn out to be a piece of our day by day life.

II. LITERATURE REVIEW

PERSONALIZED RAODV ALGORITHM FOR REDUCE LINK BREAK IN MOBILE AD HOC NETWORKS[1]by R.Senthil Kumar and P.Kamalakkannan (IEEE)

Versatile specially appointed systems is a self-arranging remote systems for cell phones. Each host is a switch and parcel forwarder. Every hub may be portable, and topology changes often and unusually because of the discretionary portability of versatile hubs. This angle prompts regular way disappointment also, course reconstructing. In this paper, customized Ad hoc On interest Distance Vector (RAODV) calculation to diminish the connection break plan for portable commercial adhoc systems. This present methodology diminishes parcel misfortune and discovers streamlined path by mulling over of transfer speed, delay which comes about by change of nature of administration.

MODIFIED REVERSE AODV ROUTING ALGORITHM USING ROUTE STABILITY IN MOBILE ADHOC NETWORKS [2] by Mehdi Zarei , KarimFaez and Javad Moosavi Nya(IEEE)

In this paper another on-interest directing convention for versatile specially appointed systems is displayed taking into account connection/course security estimation. AODV diminishes upkeep overhead in specially appointed systems, yet some way breaks can fundamentally bring about overhead. Reverse AODV (RAODV) steering calculation is one of the AODV forms which lessens overhead of directing. At the point when a dynamic course comes up short, the source hub with the consciousness of secure qualities of courses, can choose the best course in set of accessible courses. Paper proposes a strength estimation technique and connected that in a streamlined variant of specially appointed on interest separation vector (AODV) steering calculation by doing some adjustment at RAODV calculation.

REVERSE AODV ROUTING PROTOCOL EXTENSION USING LEARNING AUTOMATA IN ADHOC NETWORKS[10]by Mehdi Zarei(IEEE)

This paper proposes a novel switch on-interest steering convention for portable impromptu systems in view of best course determination with learning automata. The strategy connected is an enhanced rendition of specially appointed on-interest separation vector (AODV) steering calculation, specifically Reverse AODV (R-AODV) directing calculation. In way revelation stage, the source hub select best course that has high security between accessible paths. The principle thought that utilized as a part of proposed convention is changing wellness of courses relaxing Also with the attention to wellness of courses, source hub can choose best course in sets of accessible course, when dynamic path failures

PERFORMANCE ANALYSIS OF AODV, AODVUU, AOMDV AND RAODV OVER IEEE 802.15.4 IN WIRELESS SENSOR NETWORKS [3]by Gowrishankar.S, SubirKumarSarkar and T.G.Basavaraju(IEEE)

In this paper the attention is on the execution investigation of four steering conventions, to be specific AODV, AODVUU, RAODV and AOMDV (AODV Family). Despite the fact that AODV what's more, AODVUU are not diverse conventions, we needed to check whether there is any change in utilizing the AODVUU usage for a sensor system environment. Additionally, the converse course revelation components utilized in RAODV is checked for a sensor system. There is a need to comprehend the adaptable behavioral parts of these directing conventions in a remote sensor system with shifting movement burdens and the quantity of sources.

DYNAMIC REVERSE ROUTE IN ADHOC ON DEMAND DISTANCE VECTOR ROUTING PROTOCOL[4] byMegatF.Zuhairi and DavidA.Harle(IEEE)

A Mobile Ad hoc Network (MANET) is a heterogeneous system; an accumulation of versatile remote gadgets with distinctive qualities conveying in a irregular system topology. Much research over-streamlines by accepting that all hubs are homogeneous. Such conditions are perfect and not regularly found in genuine circumstances. Some current steering conventions are additionally similarly limited in that equivalent bidirectional connections and symmetrical ways are certain in their operation. In this paper, another Dynamic Reverse Route Ad hoc on Demand Distance Vector (DR- AODV) directing convention is proposed. This plan processes steering way with the least defer while giving versatility and quick switch course recuperation when subjected to unidirectional joins. Reproduction results demonstrate that DR-AODV perform well in situations where the quantities of unidirectional connections are extraordinarily high when thought about to essential AODV and AODV-Blacklist plans (Avoiding Unidirectional connections)

III. PROBLEM STATEMENT

MANET comprise of portable stage which correspond with one another through remote connections with no predetermined infrastructure. Every hub is a host as well as a switch that keeps up courses to and advances information packets for different hubs in the system that may not be inside immediate remote transmission range. Topology of a versatile adhoc system regularly changes quickly and we have to deal with this change and adapt to issues raised through this kind of systems. On the off chance that the source and destination hubs are not inside of the transmission scope of each other, then transitional hubs would be served as moderate switches for the correspondence between the two hubs. Besides, portable stage moves independently and imparts by means of powerfully evolving system. Accordingly, incessant change of the system topology is a fundamental test for some points, for example, routing protocol, robustness and performance degradation.

In this postulation work first consider the Ad-hoc on-Demand Distance Vector Routing Protocol (AODV) that uses an interest driven course foundation method, then an upgraded rendition of this calculation to be specific Reverse AODV (RAODV) is displayed. For expanding of convention

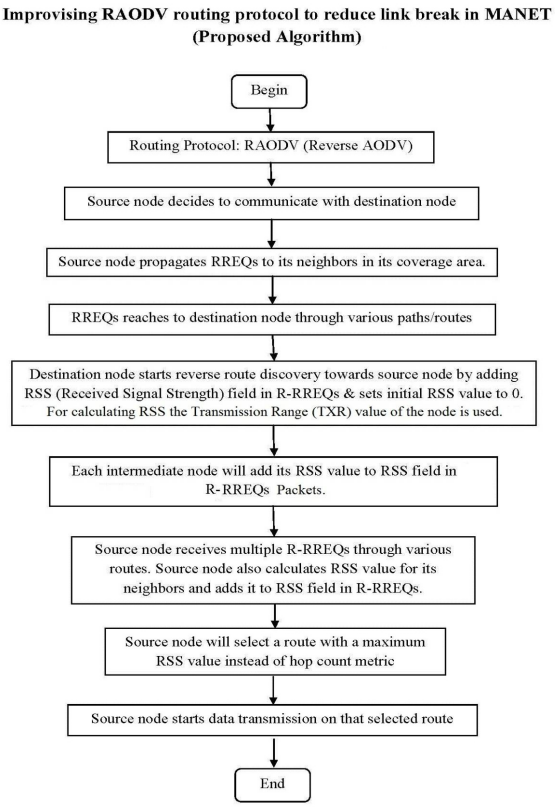
execution, RSS (Received Signal Strength) parameter to choose the best path between accessible ways is utilized. For route discovery, the path with most astounding dependability will be chosen.

IV. PROPOSED METHODOLOGY

A. Proposed Algorithm

1. SN (Source Node) Broadcast (RREQ)
2. RREQ reached DN (Destination) node through various path.
3. DN Broadcast (R-RREQ)
4. Set Received Strength Signal primary to (RSS:=0)
5. For different path calculate
6. Execute step 5 till R-RREQ reached SN from different Path
7. Select MAX_RSS value for Data Transmission

B. Flowchart of Proposed Algorithm



C. Enlightenment

1. Source node wants to connect with the Destination node. Source node broadcast RREQ Route Request Packet to their neighbor nodes that are available in its transmission range.
2. As packet is broadcast to its neighbor nodes, it will reach destination node via different paths/ routes.
3. During this process we will get the shortest path, but is not necessary that the node will remain fixed at its location as this is wireless network; node will freely move in the network. Due to this response will not be sent via a same path that it arrived.
4. In this algorithm we are going to implement same process as in RREQ but in reverse, that will be recognize as R-RREQ (Reverse Route Request).
5. An additional field in the R-RREQ packet named as RSS Received Signal Strength is been added. Initially RSS value will be set to 0 and every node will have its individual +ve RSS value.
6. Now each node will have its signal strength it will be added cumulatively in the RSS field. For calculating RSS the Transmission Range (TXR) value of the node is used.
7. Source node will receive multiple R-RREQs through various routes. Source node will also calculates RSS value for its neighbor and add it to RSS Fields in R-RREQS
8. Source node will finally select a route that is having a maximum RSS value instead of the hop count metric.
9. After the selection of that route source node will start transmission on that selected Route.

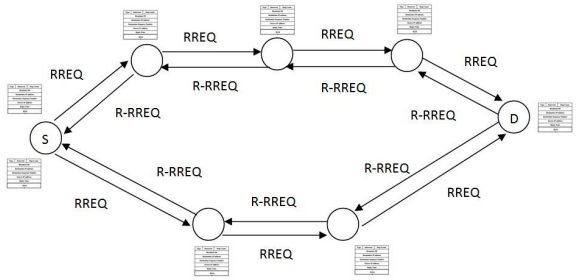


Figure: Route Discovery and Reverse RREQ in Proposed Method

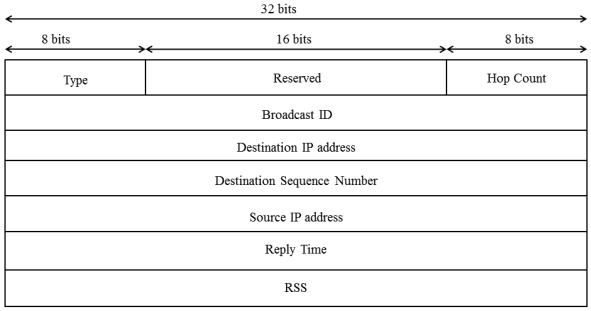


Figure: New Packet format of RRREQ packet of Proposed Method

V. SIMULATION ENVIRONMENT

As there are a few distinctive recreation packages that can be utilized for MANET reenactment, a review of the usually utilized test systems:

OPNET, NS2, QualNet and Glomosim are performed to focus the most suitable test system to utilize. In the accompanying subsections, each of these recreation packages will be introduced.

NS2

In 1996-97, work on ns form 2 (ns-2) was started in light of are considering by Steve McCann. Utilization of Tcl was supplanted by MIT's ObjectTcl (OTcl), an article arranged lingo of Tcl. The center of ns-2 is likewise composed in C++, yet the C++ reenactment articles are connected to shadow questions in OTcl and variables can be connected between both dialect domains. Reenactment scripts are composed in the OTcl dialect, an expansion of the Tcl scripting dialect. This structure licenses reproductions to be composed and adjusted in a translated situation without needing to fall back on recompiling the test system every time a basic change is made. In the time allotment in which ns-2 was presented (mid-1990s), this gave both a noteworthy comfort in staying away from numerous tedious re-compilations, furthermore permitting possibly less demanding scripting grammar for portraying recreations. ns-2 has a sidekick activity article known as the Network Animator, nam-1, initially composed by Mark Handley, utilized for perception of the recreation yield and for (restricted) graphical Configuration of reenactment situations.

VI. RESULT AND DISCUSSION

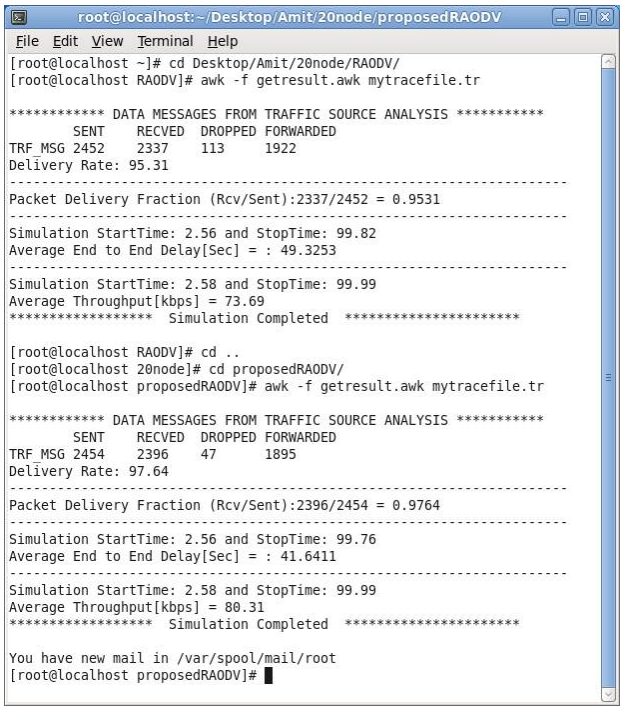


Figure 6.1: Trace File (.tr) (20 Nodes)

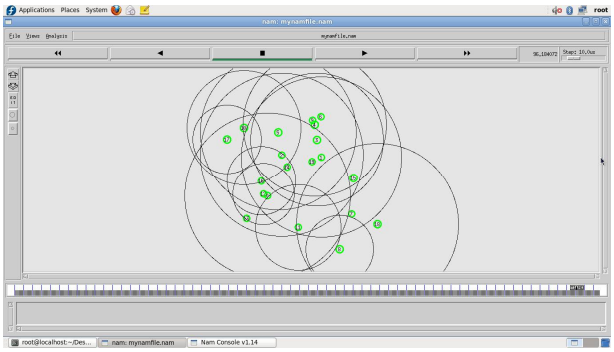


Figure 6.2: Nam File (.nam) (20 Nodes)

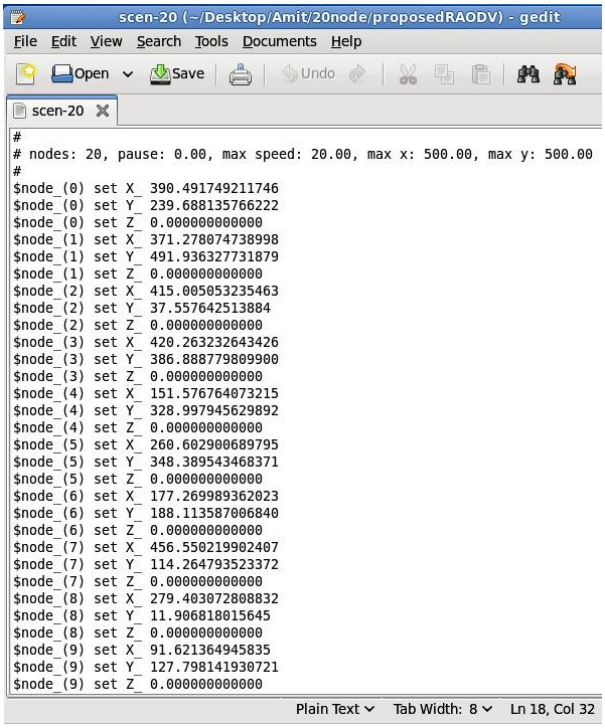


Figure 6.3: Scen File for (20 Nodes)

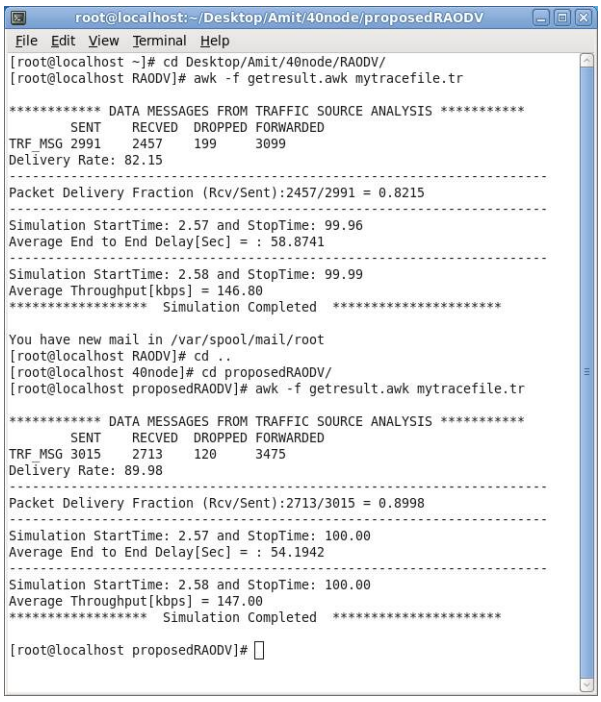


Figure 6.4: Trace File (.tr) (40 Nodes)

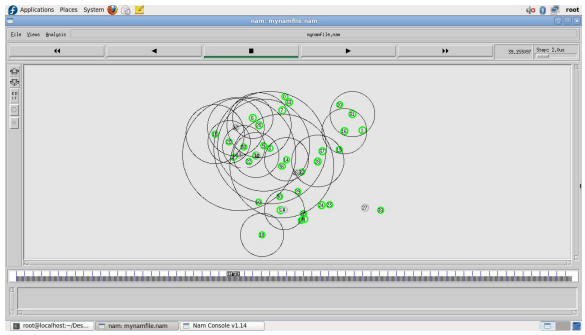


Figure 6.5: Nam File (.nam) (40 Nodes)

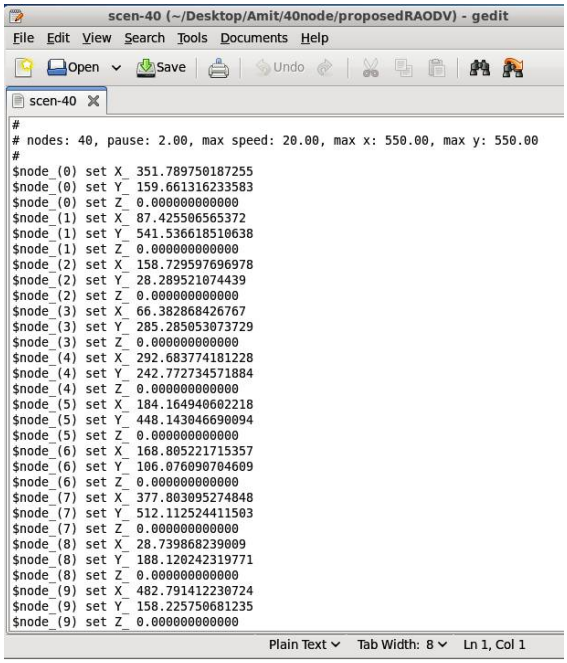


Figure 6.6: Scen File for (40 Nodes)

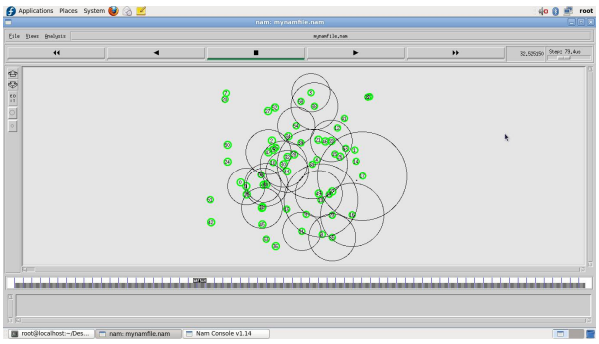


Figure 6.7: Nam File (.nam) (60 Nodes)

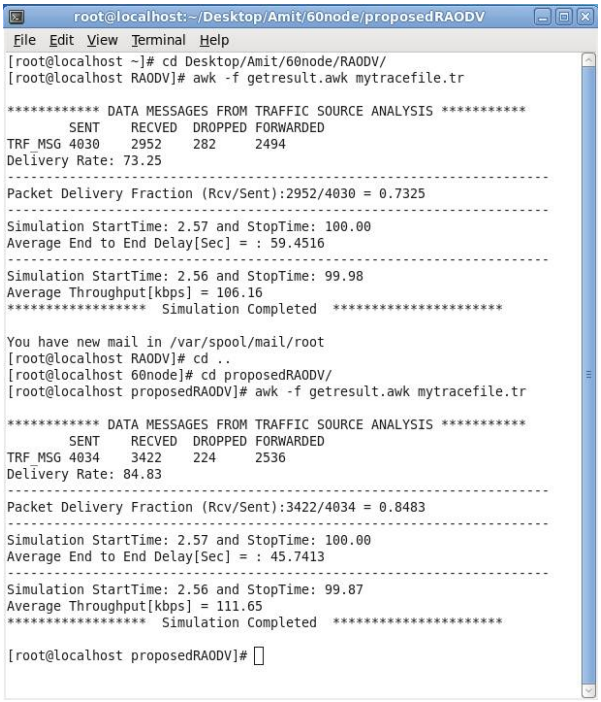


Figure 6.8: Trace File (.tr) (60 Nodes)

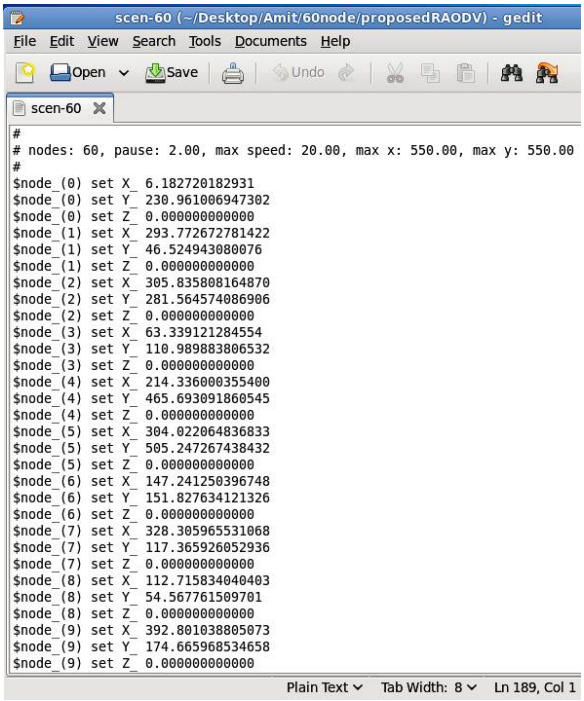


Figure 6.9: Scen File for (60 Nodes)

A. Comparison of Results

Number of Packet Sent, Received, Drop, Forwarded

	RAODV	Proposed RAODV
Node	20	20
Sent Packet	2452	2454
Received Packet	2337	2396
Dropped Packet	113	47
Packet Forwarded	1922	1895
PDF	0.9531	0.9764
Throughput	73.69	80.31

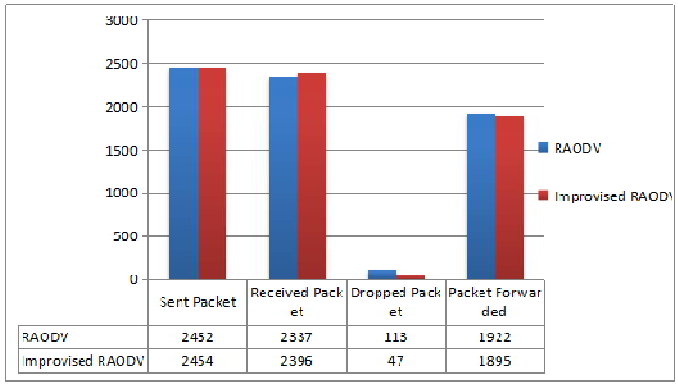
Table 6.1 Comparison of Basic RAODV and Proposed RAODV for 20 Nodes

	RAODV	Proposed RAODV
Node	40	40
Sent Packet	2991	3015
Received Packet	2457	2713
Dropped Packet	199	120
Packet Forwarded	3099	3475
PDF	0.8215	0.8998
Throughput	146.80	147.00

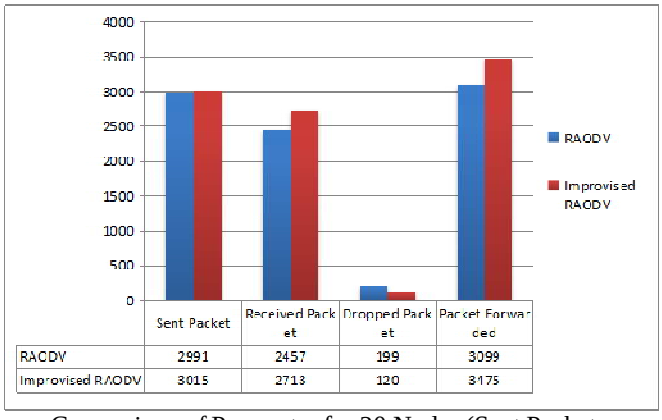
Table 6.2 Comparison of Basic RAODV and Proposed RAODV for 40 Nodes

	RAODV	Proposed RAODV
Node	60	60
Sent Packet	4030	4034
Received Packet	2952	3422
Dropped Packet	282	224
Packet Forwarded	2494	2536
PDF	0.7325	0.8483
Throughput	106.16	111.65

Table 6.3 Comparison of Basic RAODV and Proposed RAODV for 60 Nodes

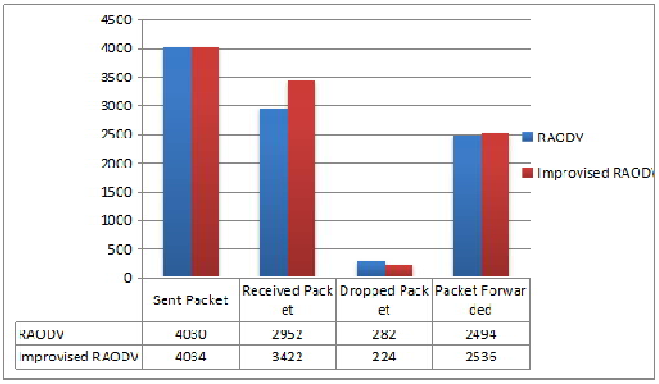


Comparison of Parameter for 20 Nodes (Sent Packets, Received Packet, Dropped Packet, Forwarded Packets)



	Sent Packet	Received Packet	Dropped Packet	Packet Forwarded
RAODV	2991	2457	199	3099
Improvised RAODV	3015	2718	120	3175

Comparison of Parameter for 20 Nodes (Sent Packets, Received Packet, Dropped Packet, Forwarded Packets)



	Sent Packet	Received Packet	Dropped Packet	Packet Forwarded
RAODV	4030	2952	282	2494
Improvised RAODV	4084	3422	224	2535

Comparison of Parameter for 20 Nodes (Sent Packets, Received Packet, Dropped Packet, Forwarded Packets)

VII. CONCLUSION

RAODV sends the packet from source to destination node; in this method we worked efficiently on proposed ROADV that reduce a Link break in the MANET network. To reduce a link break we find's alternative paths to communicate from source to destination node. While working on RAODV we improve Reactive Routing Protocol RAODV as our proposed work.

In this proposed work we update R-RREQ packet and add new additional field in existing packet known as RSS(Received Strength Signal). In this work the numbers of Dropped packets in Proposed RAODV are very less as compare to Basic RAODV. Link Breaks are reduced thoroughly in the scheme so that the communication between source node and Destination node are hassle free.

After implementation of proposed work the result exploration of ROADV and proposed RAODV we get improvement in the result of PDF and Throughput of the packets in communication between Source and Destination nodes in our proposed work.

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