

Energy Efficient Multipath Routing Protocol for Manet Using Fitness Function

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Abstract : Consumption Is Considered As One Of The Major Limitations In Manet, As The Mobile Nodes Do Not Possess Permanent Power Supply And Have To Rely On Batteries, Thus Reducing Network Lifetime As Batteries Get Exhausted Very Quickly As Nodes Move And Change Their Positions Rapidly Across Manet. The Research Proposed In This Paper Highlights This Very Specific Problem Of Energy Consumption In Manet By Applying The Fitness Function Technique To Optimize The Energy Consumption In Ad Hoc On Demand Multipath Distance Vector (Aomdv) Routing Protocol. The Fitness Function Is Used To Find The Optimal Path From The Source To The Destination To Reduce The Energy Consumption In Multipath Routing. The Performance Of The Proposed Ff-Aomdv Protocol Was Evaluated By Using Network Simulator Version 2 (Ns-2). The Results Clearly Demonstrate That The Proposed Ff-Aomdv Outperformed Aomdv And Aomr-Lm Under Majority Of The Network Performance Metrics And Parameters. It Encrypts The Packets Data For Security. Mobile Ad Hoc Network (Manet) Is A Collection Of Wireless Mobile Nodes That Dynamically Form A Temporary Network Without The Reliance On Any Infrastructure Or Central Administration. Energy

Keywords – Aomdv , Encryption, Energy Efficiency, Multipath Routing, Manets ,Network Lifetime

I. INTRODUCTION

Multipath Routing Approaches [2-7] Are Introduced To Find Multiple Paths Between A Source-Destination Pairs.

Multiple Routes Between A Source-Destination Pair Gives Several Benefits Such As: Higher Utilization Of Bandwidth,

Lower End-To-End Delay, Higher Throughput, Higher Network Life Etc. It Also Applies Load Balancing In The Network By Carrying The Traffic Through Multiple Paths. It Reduces Network Congestion And Protection Against Route Failures. Path Discovery Mechanism In Multipath Routings Is Very Similar To Single Path Routing In Manets [8]. Most Of The Time It Chooses Disjoint Paths To Carry Forward The Traffic Between Source And Destinations. Multi-Paths Can Be Of Two Types: Ink-Disjoint, And Node-Disjoint. For A Given Source Destination(S-D) Pair The Set Of Link-Disjoint Routes Comprises Of Paths That Have No Link In Common Other Than Constituent S-D Path. Similarly, In Node-Disjoint Approach Routes Comprises Of Paths That Have No Common Node (Other Than The S-D) Present In More Than One Constituent Path. Manet Multipath On-Demand Routing Protocols Compute Multiple Numbers Of Paths Between A Source-Destination Pair, In A Single Route Discovery Attempt. A New Route Discovery Operation Is Initiated Only When All The Paths Fails Between A Source-Destination Pair [8, 9].

The Rest Of This Paper Is Organized As Follows: Section Ii Reviews Some Closely Related Protocols. Working Principles And Simulation Results Of The Proposed Eaomdv Is Discussed In Section- Iii; And The Conclusion

II. RELATED WORK

In Recent Years Some Multipath Routing Protocols Are Proposed In Literature. Majority Of Them Apply On-Demand

Approaches To Find The Paths Between Source-Destination Pair. Many Extension Of Single Path Routing Protocols Are Proposed For Multipath Routing. Most Of These Protocols Use Hop-Count Metric To Select The Path. However, Hop-Count Based Approaches Are Not Energy Efficient. In This Section We Discussed A Few Existing Multipath Routing Protocols. The Existing Multipath Routing Protocols Are Variants Of Fundamental Routing Protocols Like Aodv And Dsr, Which Are Discussed In.

Scalable Multipath On-Demand Scalable Multipath On-Demand Routing (Smort) [10] Is

A Variants Of Aodv Protocol. The Objective Of Smart Is To Reduce Routing Overheads. It Uses Fail-Safe Multiple Paths Instead Of Node-Disjoint And Link-Disjoint Paths [11]. Aodv Multiple Alternative Paths (Aodv-Map) [12] Is Another Extension Of Aodv Routing Protocol. It Uses Both Fail-Safe Paths As Well As Node-Disjoint And Link-Disjoint Paths.

The Objective Of The Protocol Is To Choose More Number Of Alternative Paths Than Node-Disjoint And Link-Disjoint Paths. Split Multipath Routing (Smr) [13] Is An On-Demand Multipath Routing Protocol Based On Dsr [14]. Main Intention Of This Protocol Is Choose Maximally Disjoint Paths, Which Minimizes The Route Discovery And Control Message Overhead. To Reduce The Control Message Overhead The Data Traffic Forwarded Through Multiple Routes. Delay-Aware Multipath Source Routing (Dmsr) [15] Is An Extension Of Dsr. It Initiates Route Discovery Process By Considering Accumulation Delay And Node Delay. Above Two Delays Factor Is Calculated As Metric For Path Selection. Multipath Source Routing (Msr) [16] Is Another Variant Of Dsr. The Computed Node-Disjoint Paths To Extend The Functionality Of The Route Discovery And Route Maintenance Phase. By Using Of Source Routing Mechanism, Discovered Paths Are Stored In Route Cache With A Unique Index.

AOMDV THE PROPOSED PROTOCOL

We Proposed A New Multipath Routing Protocol Called The Ff-Aomdv Routing Protocol, Which Is A Combination Of Fitness Function And The Aomdv's Protocol. In A Normal Scenario, When A Rreq Is Broadcasted By A Source Node, More Than One Route To The Destination Will Be Found And The Data Packets Will Be Forwarded Through These Routes Without Knowing The Routes' Quality. By Implementing The Proposed Algorithm On The Same Scenario, The Route Selection Will Be Totally Different. When A Rreq Is Broadcast And Received, The Source Node Will Have Three (3) Types Of Information In Order To Find The Shortest And Optimized Route Path With Minimized Energy Consumption.

The Research Proposed In This Paper Highlights This Very Specific Problem Of Energy Consumption In Manet By Applying The Fitness Function Technique To Optimize The Energy Consumption In Ad Hoc On Demand Multipath Distance Vector (Aomdv) Routing Protocol. The Proposed Protocol Is Called Ad Hoc On Demand Multipath Distance Vector With The Fitness Function (Ff-Aomdv). The Fitness Function Is Used To Find The Optimal Path From The Source To The Destination To Reduce The Energy Consumption In Multipath Routing. The Performance Of The Proposed Ff-Aomdv Protocol Was Evaluated By Using Network Simulator Version 2 (Ns-2), Where The Performance Was Compared With Aomdv And Ad Hoc On Demand Multipath Routing With Life Maximization (Aomr-Lm) Protocols, The Two Most Popular Protocols Proposed In This Area. The Comparison Was Evaluated Based On Energy Consumption, Throughput, Packet Delivery Ratio, End-To-End Delay, Network Lifetime And Routing Overhead Ratio Performance Metrics, Varying The Node Speed, Packet Size And Simulation Time. The Results Clearly Demonstrate That The Proposed Ff-Aomdv Outperformed Aomdv And Aomr-Lm Under Majority Of The Network Performance Metrics And Parameter.

III. SYSTEM ARCHITECTURE

The System Architecture Is Explained In The Below Fig 1.1 Which Shows The Optimum Path In Dotted Lines And The Alternative Path In Straight Lines And It Has The Advantages Of Network Lifetime , Energy Efficiency And Also Encrypting The Data Packet.

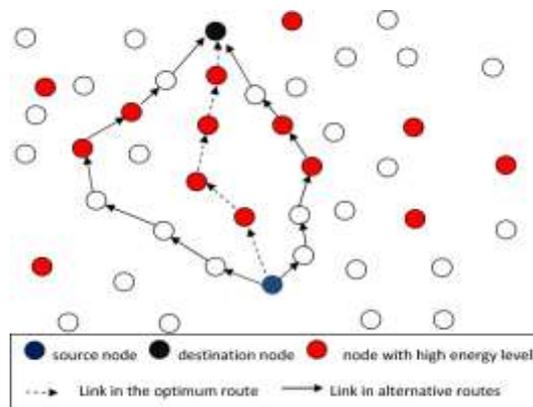


Fig 1.1

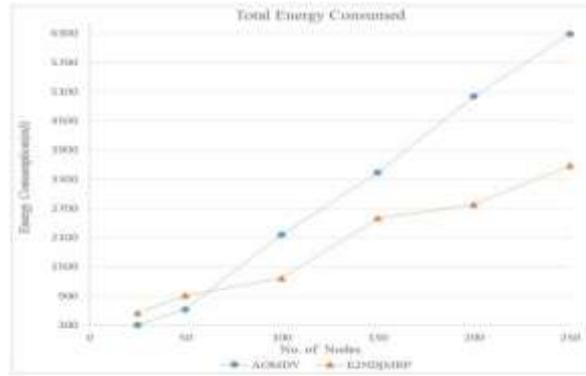


Fig 1.2

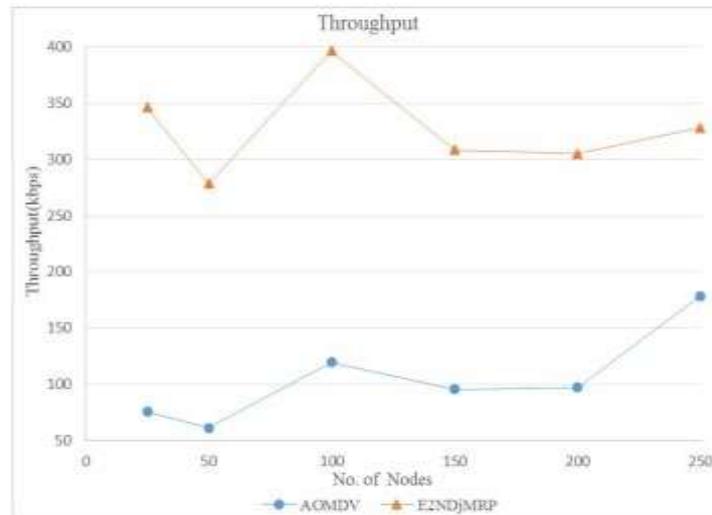


Fig 1.3

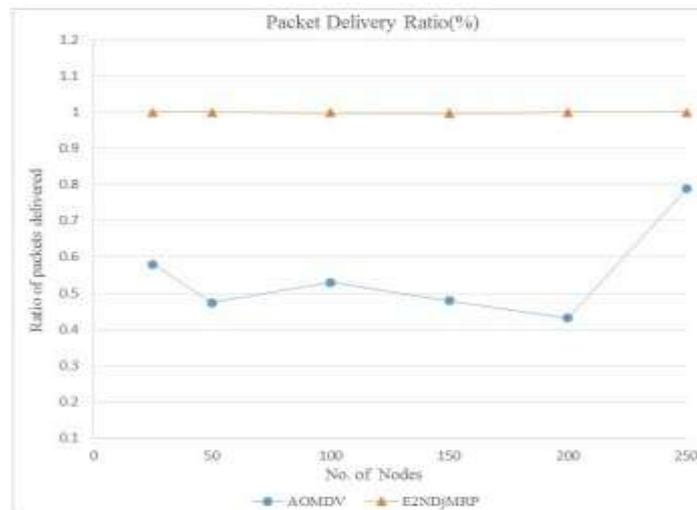


Fig1.3

IV. Conclusion

In This Paper, A New Routing Protocol Is Proposed. The Proposed Protocol Uses A Cost Function Which Considers Both Residual Battery Power And Present Traffic Load At A Simulator 2.2.28 And Results Are Compared With An Existing Protocol And It Is Found That The Proposed Ffaomdv Performs Better In Term Of Higher Packet Delivery Fraction And Higher Energy Efficiency. It Has Also Lower End-To-End Delay

And Lower Routing Overhead. The Proper Work Can Be Extending Further By Using Other Types Of Mobility Models And At Different Traffic Models

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