Link Failure Responsive Approach for Optimized Data Delivery in Mobile Ad-hoc Network

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Abstract: There are currently two variations of mobile wireless networks Infrastructure and Infrastructure less networks. The infrastructure networks, also known as Cellular network, have fixed and wired gateways. They have fixed base stations that are connected to other base stations through wires. The transmission range of a base station constitutes a cell The network nodes in a MANET, not only act as the ordinary network nodes but also as the routers for other peer devices. The routers move freely and organize themselves randomly and the network topology may change rapidly and spontaneously also there is no centralized gateway device to monitor the traffic within network. More specifically, in our geo-routing method, the node which retains a data item first broadcasts a neighbor search message when it moves beyond d. Then, when a node receives the neighbor search message, if it is closer to the data point than the source node, it sets a waiting time for sending a reply. Because nodes closer to the data point transmit a reply message after a shorter waiting time.

Keyword: MANET,LBS, SPRD.

I. INTRODUCTION

There are currently two variations of mobile wireless networks Infrastructure and Infrastructure less networks. The infrastructure networks, also known as Cellular network, have fixed and wired gateways. They have fixed base stations that are connected to other base stations through wires. The transmission range of a base station constitutes a cell. All the mobile nodes lying within this cell connects to and communicates with the nearest bridge (base station). A hand off occurs as mobile host travels out of range of one Base Station and into the range of another and thus, mobile host is able to continue communication seamlessly throughout the network. Example of this type includes office wireless local area networks (WLANs).Wireless sensor nodes deployed in home, military, science and industry. Wireless sensor networks have an endless array of applications such as transportation, health care, security, disaster recovery, warfare, industrial and building automation, forest surveillance, agriculture, environment monitoring, space exploration, military surveillance, structural monitoring and habitat monitoring. [1,4] The other type of network, Infrastructure less network, is known as Mobile Ad Network (MANET). A Mobile Ad-hoc Network (MANET) is a self-configuring network of wireless and hence mobile devices that constitute a network capable of dynamically changing topology. The network nodes in a MANET, not only act as the ordinary network nodes but also as the routers for other peer devices. The routers move freely and organize themselves randomly and the network topology may change rapidly and spontaneously also there is no centralized gateway device to monitor the traffic within network. Since the medium is open for all nodes, both legitimate and malicious nodes can access it[5,10]

A) Location Dependent Neighbor Search

In MANETs, each node plays a role of router. Even if the source and the destination mobile nodes are not within communication range of each other, data packets are forwarded to the destination mobile node by relaying the transmission through intermediary mobile nodes. Since no special infrastructure is required, many MANET-based applications are expected to be developed in various fields such as military affairs and rescue operations (i.e., collaborating works). Location-based service (LBS) is typical applications for MANETs, which are typically composed of a large number of nodes over a wide area [9, 8, and 6]. In LBS, real-time location-specific queries for information held by mobile nodes are often used; and in such cases, it is effective to process the queries as k nearest neighbor (SPRD) and convex hull queries for supporting collaborating works in MANETs [5].from diverse sensors into an only message [7]. The most important purpose of data aggregation is to increase the network life span by reducing the utilization of sensor nodes such as battery energy and bandwidth.

II. RELATED WORK

Nishant Sitapara, (2010) SPRD series which is one of the possible delays in ad hoc networks. In a SPRD series, a malicious node impersonates a destination node by sending a spoofed route reply packet to a source node that initiates a route discovery. By doing this, the malicious node can deprive the traffic from the source node. In Mobile ad hoc networks where the network topology dynamically changes, conventional methods cannot be used efficiently. In this project, Detection scheme using dynamic training method in which the training data is updated at regular time intervals[5]

A.   **Rahul Deshmukh, (2014)** A Mobile Ad hoc Network (MANET) is a kind of wireless ad-hoc network, and is a self configuring network of Mobile routers (and associated hosts) connected by wireless link. The routers are free to move randomly and organize themselves arbitrarily, thus the network's wireless topology may change rapidly and unpredictably. There are various routing protocols available for Manets. The most popular ones are DSR, AODV and DSDV. However, these protocols typically suffer from a number of shortcomings, such as high routing overhead and limited scalability. With extent the Mobile node also comes with limited source of power. The Node energy is mainly consumes in the process of receiving, transmitting, sensing and routing out of which routing load can be varied with efficient mechanism. [3]

M. Swathi, (2014) Due to upturn of inexpensive, widely available wireless devices, Ad-hoc networks has now become one of the most vibrant and active field of communication and networks. A Mobile Ad-hoc Network (MANET) is a self articulation wireless Ad-hoc network of Mobile nodes. Each node has a router or a switch connected by wireless connection. A MANET depends upon the location of nodes, their connectivity, their service discovery capability, and ability to search and route messages using the nearest nodes used NS2 simulator from scalable networks to perform the simulations. NS2 is a discrete event driven packet level network simulator. It support for TCP, routing and multicast protocols over wired and wireless network. Ad hoc routing protocols (DSDV, AOMDV) and their metrics (Throughput, end to end delay, Packet loss) using NS2.[2]

III.   PROPOSED METHODOLOGY

 MANET, a centralized approach is inappropriate. For example, if data items were transmitted to a specific node as soon as they were generated, the query-issuing node could acquire SPRD by transmitting a query to the specific node because the specific node would have all the data items and know the SPRD for all queries (i.e., all query points). However, this is not realistic owing to the Nodes' limited storage capacity, i.e., the size of all the data items in the network is too large for each mobile node to store. Moreover, the transmission of numerous queries to the specific node would cause a temporary spike in traffic volume in the vicinity of the node.

In LBS, users often require location-dependent data items from near their own location; and when using an SPRD query, they repeatedly require the SPRD from their own location. Therefore, a method is needed in which nodes retain data items
whose location is close to their own, keeping in mind that nodes' locations will change as they move. Note that SPRD from the own location change along node mobility.
Original Data Item When a node retaining an original data item moves beyond a given data boundary, away from the data point with which the item is associated, the original item is transmitted to the node nearest its data point, using our geo-routing method (an extension of the protocol proposed in which adopts a three-way handshake protocol to send a data item to the neighboring node nearest the data point. By repeating this procedure, the data is forwarded to the node nearest its dependent location.

More specifically, in our geo-routing method, the node which retains a data item first broadcasts a neighbor search message when it moves beyond d. Then, when a node receives the neighbor search message, if it is closer to the data point than the source node, it sets a waiting time for sending a reply. Because nodes closer to the data point transmit a reply message after a shorter waiting time, the nearest neighboring node from

Proposed Algorithm
 S: Source Node
 RREQ: Route Request
 RREP: Route reply
 1. Begin
 2. For (source node S)
 3. {
Broadcast RREQ packet to every neighbor node
Receive RREP
     RREP will be SPRD among various reply having largest sequence number &minimum hop   count and all other RREP
   buffered at originating node
Process RREP
 }
 4. If (Information is Suitable with Stable path && replied info is right)
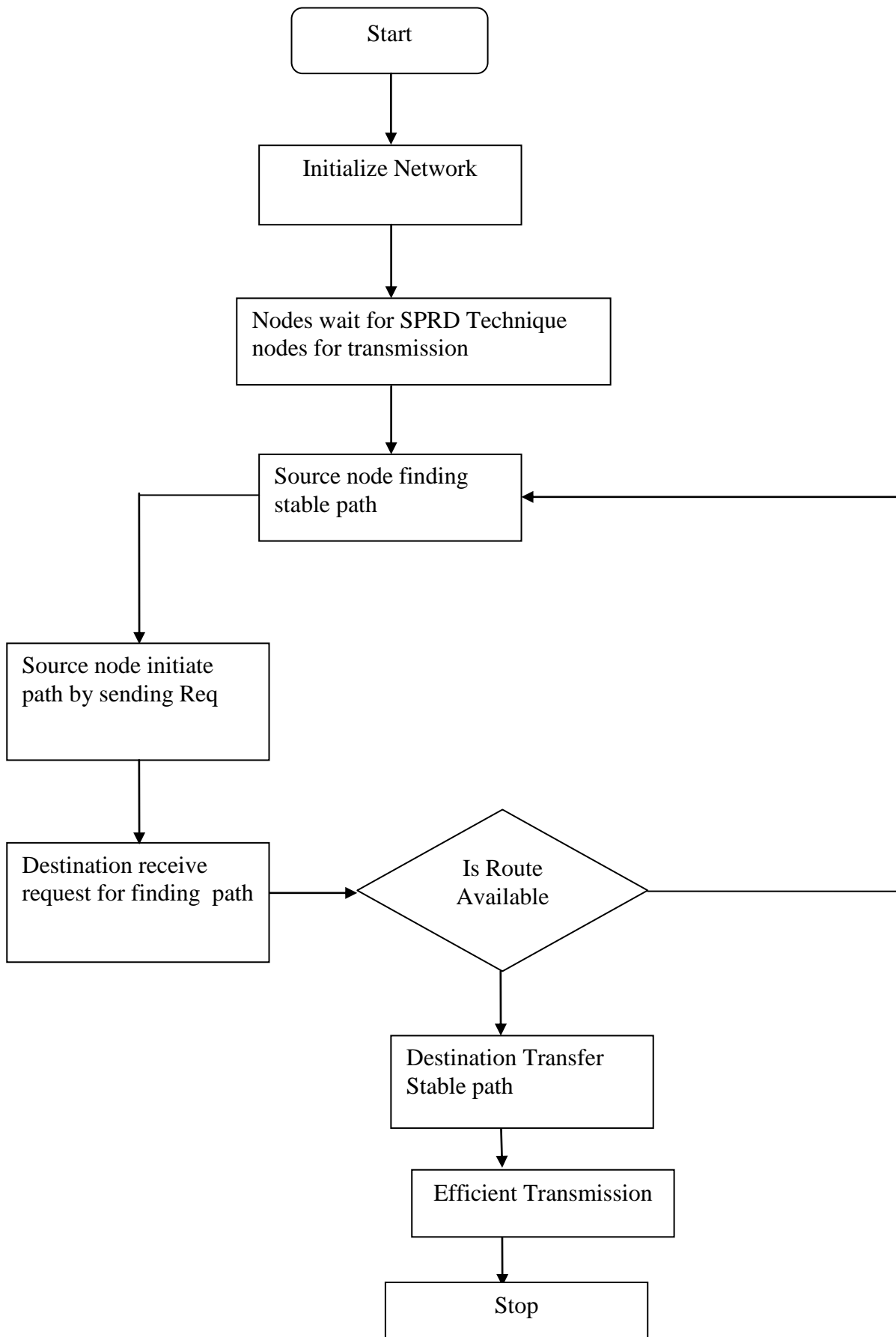 5. If (Declare node Having Stable path transfer data to Stable path && Exit)
 6. Else
 {
Declare node not having RREP with stable path
Go to Step 4
 }
 7. Exit

```
                          ┌─────────────┐
                          │    Start    │
                          └─────────────┘
                                │
                                ▼
                       ┌──────────────────┐
                       │ Initialize Network│
                       └──────────────────┘
                                │
                                ▼
                    ┌──────────────────────────┐
                    │ Nodes wait for SPRD       │
                    │ Technique nodes for       │
                    │ transmission              │
                    └──────────────────────────┘
                                │
                                ▼
                    ┌──────────────────────────┐
                    │ Source node finding       │◄──────────┐
                    │ stable path               │           │
                    └──────────────────────────┘           │
                                │                           │
                                ▼                           │
          ┌──────────────────────────┐                     │
          │ Source node initiate      │                     │
          │ path by sending Req       │                     │
          └──────────────────────────┘                     │
                                │                           │
                                ▼                           │
          ┌──────────────────────────┐      ◇              │
          │ Destination receive       │──►  Is Route ──────┘
          │ request for finding  path │     Available
          └──────────────────────────┘      ◇
                                                │
                                                ▼
                                   ┌──────────────────────┐
                                   │ Destination Transfer  │
                                   │ Stable path           │
                                   └──────────────────────┘
                                                │
                                                ▼
                                   ┌──────────────────────┐
                                   │ Efficient Transmission│
                                   └──────────────────────┘
                                                │
                                                ▼
                                   ┌──────────────────────┐
                                   │        Stop           │
                                   └──────────────────────┘
```

V. RESULT AND ANALYSIS

S. No.	Parameter	Value(s)
1	Simulator used	NS 2.35
2	Simulation Time	10 Secs
3	Simulation Area	1000 X 1000
4	MAC	802.11
5	Number of nodes	25
6	Speed of Nodes	2 to 16 (m/sec)
7	Mobility Model	Random Waypoint
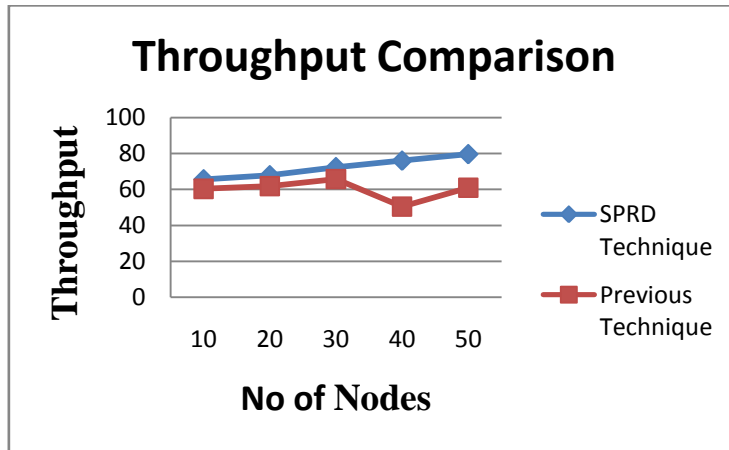
Fig1comparison of Throughput

Sensor Nodes	SPRD Technique	Previous technique
10	65.6013856	60.28450312
20	67.8625277	61.79310343
30	72.3683084	65.66630964
40	75.9632116	50.41117055
50	79.5842574	60.85714296

Table1comparison of Throughput

The analysis of Throughput with previous technique for finding irregular path   are shown in Fig1 the results in Table1 shows that Throughput   using SPRD Technique is high as compared to previous technique with increase in no of nodes .which shows our technique SPRD has better results as compared to previous technique in terms of Throughput
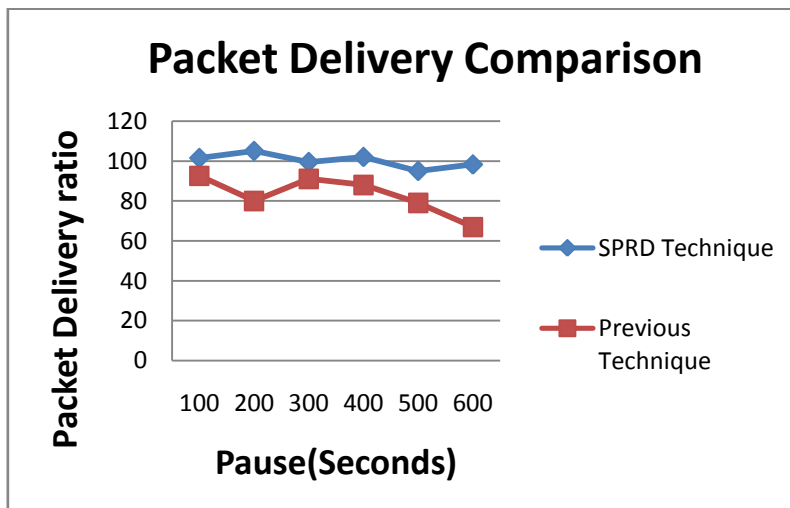

Fig 2 Comparison of Packet Delivery ratio

221

Table2 Comparison of Packet Delivery ratio

Pause (Seconds)	SPRD Technique	Previous Technique
100	101.5	92.5
200	105	80
300	99.5	91
400	102	88
500	95	79
600	98.26	67

Above graphs show the experiment results of packets delivery rate. We can see, under low traffic load as 10 sources. SPRD Technique outperforms then AODV. This result Shows that SPRD Technique have more routing control packets but may always choose the fresh route, while AODV with smaller number of routing packets under stressfully situation with the network topology continue to change from time to time, will be inclined to choose wrong routes, thus lower the packets delivery rate.

VI. CONCLUSION

As the available wireless networking and mobile computing hardware is now capable of fulfilling the promise of this technology. It is the need of the hour to design and develop routing protocols which should support the performance with endurance. The correct execution of these routing protocols is mandatory for smooth functioning of a MANET. A large number of different kinds of routing protocols are practiced in mobile Ad hoc networks. The use of a specific routing protocol in mobile Ad hoc network depends upon number factors including size of the network, load, mobility requirements, routing overhead and end-to-end delay system and improve the data collection efficiency as compared to previous technique . the data is forwarded to the node nearest its dependent location. More specifically, in our geo-routing method, the node which retains a data item first broadcasts a neighbor search message when it moves beyond d. Then, when a node receives the neighbor search message, if it is closer to the data point than the source node, it sets a waiting time for sending a reply. Because nodes closer to the data point transmit a reply message after a shorter waiting time, from the nearest neighboring node.

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