IJREAT International Journal of Research in Engineering & Advanced Technology, Volume 2, Issue 1, Feb-Mar, 2014
ISSN: 2320 - 8791
www.ijreat.org

Implementation of POR Protocol for The Efficient Data Delivery in Dynamic Mobile Ad Hoc Networks

Mahendra Vemuri[1], Kavitha.P[2]

[1]*PG Student Department of Computer Science, Hindustan University, Padur, Chennai, India.*

[2]*Assistant Professor Department of Computer science, Hindustan University, Padur, Chennai India.*

Abstract - In geographic routing, nodes need to maintain up-to-date positions of their immediate neighbors for making effective forwarding decisions. Periodic broadcasting of beacon packets that contain the geographic location coordinates of the nodes is a popular method used by most geographic routing protocols to maintain neighbor positions. It contend and demonstrate that periodic beaconing regardless of the node mobility and traffic patterns in the network is not attractive from both update cost and routing performance points of view. It proposes the Adaptive Position Update (APU) strategy for geographic routing, which dynamically adjusts the frequency of position updates based on the mobility dynamics of the nodes and the forwarding patterns in the network. APU is based on two simple principles: 1) nodes whose movements are harder to predict update their positions more frequently (and vice versa), and (ii) nodes closer to forwarding paths update their positions more frequently (and vice versa). Our theoretical analysis, which is validated by NS2 simulations of a well-known geographic routing protocol, Greedy Perimeter Stateless Routing Protocol (GPSR), shows that APU can significantly reduce the update cost and improve the routing performance in terms of packet delivery ratio and average end-to-end delay in comparison with periodic beaconing and other recently proposed updating schemes. The benefits of APU are further confirmed by undertaking evaluations in realistic network scenarios, which account for localization error, realistic radio propagation, and sparse network.

Index Terms- geographic routing, Resource Scheduling, Node information, Node Isolation, Random walk Algorithm, Message Transmission

1. INTRODUCION

RESILIENCE of networks under random user arrival and departure (i.e., churn) has recently become an active research area. One of the primary metrics of resilience is *graph disconnection* during which a network partitions into several nontrivial sub graphs and starts to offer limited service to its users. However, most partitioning events in well-connected are single-node isolations, which occur when the immediate neighbours of a node fail before is able to detect their departure and then replace them with other alive users. For such networks, node isolation analysis has become the primary method for quantifying network resilience in the presence of user churn In fact, the second strategy based on random walks on age-proportional graphs demonstrates that, for lifetimes with infinite variance, the system monotonically *increases* its resilience as its age and size grow. Specifically, it shows that the probability of isolation converges to zero as these two metrics tend to infinity. The paper is finish with simulations in finite-size graphs that demonstrate the effect of this result in practice.

2. MOBILE AD HOC NETWORKING

Mobile Ad hoc Network (MANET) is one that comes together as needed, not necessarily with any support from the existing Internet infrastructure or any other kind of fixed stations. It can formalize this statement by defining an ad hoc network as an autonomous system of mobile hosts (also serving as routers) connected by wireless links, the union of which forms a communication network modeled in the form of an arbitrary graph. This is in contrast to the well-known single hop cellular network model that supports the needs of wireless communication by installing base stations as access points. In these cellular networks, communications between two mobile nodes completely rely on the wired backbone and the fixed base stations. In a MANET, no such infrastructure exists and the network topology may dynamically change in an unpredictable manner since nodes are free to move.

2.1 APPLICATIONS OF MANETS

There are many applications to ad hoc networks. As a matter of fact, any day-to-day application such as electronic email and file transfer can be considered to be easily deployable within an ad hoc network environment. Web services are also possible in case any node in the network can serve as a gateway to the outside world. In this discussion, it need not emphasize the wide range of military applications possible with ad hoc networks. Not to mention, the technology was initially developed keeping in mind the military applications, such as battlefield in an unknown territory where an infrastructured network is almost impossible to have or maintain. In such situations, the ad hoc networks having self-organizing capability can be effectively used where other technologies either fail or cannot be deployed effectively. Advanced features of wireless mobile systems, including data rates compatible with multimedia applications, global roaming capability, and coordination with other network structures, are enabling new applications.

2.2 ROUTING IN A MANET

It has become clear that routing in a MANET is intrinsically different from traditional routing found on infrastructured networks. Routing in a MANET depends on many factors including topology, selection of routers, and initiation of request, and specific underlying characteristic that could serve as a heuristic in finding the path quickly and efficiently. The low resource availability in these networks demands efficient utilization and hence the motivation for optimal routing in ad hoc networks. Also, the highly dynamic nature of these networks imposes severe restrictions on routing protocols specifically designed for them, thus motivating the study of protocols which aim at achieving routing stability. One of the major challenges in designing a routing protocol for ad hoc networks stems from the fact that, on one hand, a node needs to know at least the reachability information to its neighbors for determining a packet route and, on the other hand, the network topology can change quite often in an ad hoc network. Furthermore, as the number of network nodes can be large, finding route to the destinations also requires large and frequent exchange of routing control information among the nodes.

3. RELATED WORK

Noa Arad, Yuval Shavitt defines that many of the problems of position-based routing originate from the fact that the shape of the network is unknown a priori, and it is dynamically changing due to node mobility. GPSR, for example, switches from recovery mode back to greedy mode when the current node is closer to the destination than the node who switched to perimeter mode. However, there is no guarantee that this node, or the next one, will not be another concave node, a local maximum on the perimeter face.

Dazhi Chen, Jing Deng, Pramod K. Varshney proposed a Contention-based Geographic Forwarding (CGF) technique. Accordingly, CGF mainly consists of the following components: A predefined forwarding area and nodes that reside in the area become next-hop candidate nodes; a distributed contention arbitration and resolution scheme to effectively establish a single next-hop node in the forwarding area; a next-hop node selection criterion so as to attain the desired network performance efficiently; and an effective mechanism to handle voids. A high-level model of CGF is established.

Eric Rozner Jayesh Seshadri Yogita Ashok Mehta Lili Qiu proposed a Simple Opportunistic Adaptive Routing protocol (SOAR) to explicitly support multiple simultaneous flows in wireless mesh networks. SOAR incorporates the following four major components to achieve high throughput and fairness: adaptive forwarding path selection to leverage path diversity while minimizing duplicate transmissions, priority timer-based forwarding to let only the best forwarding node forward the packet, local loss recovery to efficiently detect and retransmit lost packets, and adaptive rate control to determine an appropriate sending rate according to the current network conditions.

Brad Karp, H. T. Kung discussed the two dominant factors in the scaling of a routing algorithm, the rate of change of the topology and the number of routers in the routing domain. Under GPSR, packets are marked by their originator with their destinations' locations. As a result, a forwarding node can make a locally optimal, greedy choice in choosing a packet's next hop.

4. PROPOSED WORK

A novel Position-based Opportunistic Routing (POR) protocol is proposed, in which several forwarding candidates cache the packet that has been received using MAC interception. A joining node randomly selects alive users from the system and chooses the user with the maximal age. Random walk algorithms have been used to replace failed links with new ones. Introduce a new-neighbor selection strategy that is based on random walks over weighted directed graphs to identify the isolated node. Calculating the age for each node based on sum of weight of in degrees of a node

4.1 Node information & Topology construction

In this module node information is for initializing the number of nodes, giving names to those nodes, initializing the port numbers for a particular node and provision of host name. In node information, node name and port number must be unique for each node. Host name must be given to run nodes in multiple systems. For topology construction it provide the links for the initialized nodes. It also provide cost to the various links. It checks there is no multiple links for same set of nodes. Cost specification is given to all nodes. Each node in network has capable of sending and receiving information through their unique port number. Based on node information and topology construction, each node can calculate the available path and best path for message transmission.

4. 2 Node Isolation

A node which does not have any connection with any other in a network then that node is said to be isolate from network. In unstructured topology, nodes can randomly arrive and departure. When a node get departure, other nodes link gets disconnected. Network resilience is *graph disconnection* during which a P2P network partitions into several nontrivial sub graphs and starts to offer limited service to its users. Due to graph disconnection, isolated node cannot be able to communicate to other nodes in a network. Isolated node cannot make any communication with any other node in network. Message transmission is impossible with isolated node. When number of nodes gets isolated is high, and then end-end communication is poor.

4. 3 Random walk Algorithm

A new-neighbour selection strategy that is based on random walks over weighted directed graphs. In this module, node age is calculated by sum of weight of in degrees of each node and age is provided to each node. When nodes get isolated, it selects the maximum node age and starts its offer to its users. Each login node also chooses maximum node age and joins in network for providing its services to increase its residual lifetime. Random walk on age-proportional graphs demonstrates that, for lifetimes with infinite variance, the system monotonically *increases* its resilience as its age and size grow. Using Random walk algorithm, P2P networks are single-node isolations, can be identified by immediate neighbors of a node to detect their departure and then replace them with other alive users.

4.4 Message Transmission

In this module, message gets transmitted between the nodes .when node is isolated it selects random walk algorithm and chooses its neighbor and reconstruct the topology and message is transmitted in alternate path. The source node chooses the destination and passes the message using the method of random walk algorithm to avoid graph disconnection for sending its message in the best path available. Once the client completes its message and sends the message, the client gets the knowledge about the available paths and it also gets the information about the best path and the details regarding the particular path. When the destination system is isolated, it can receive message as isolated node. Then source can use random walk algorithm and resend the message using alternate path. Once the message reached the destination, source can receive the acknowledgement message from the destination.

5. PROPOSED ALGORITHM

5.1 Random walk Algorithm

Input: similarity network G (V, E);

Starting node n

Restart probability α;

Output: stationary vector for random walk starting at n;

(1) Let S be the restart vector with all its entries initialized to 0 expect a 1 for the entire denote by n

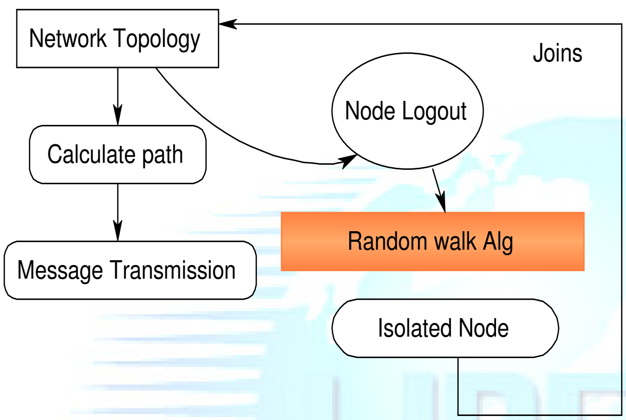
(2) Let P be the row normalized adjacency (transition) matrix defined by G;

(3) Initialize X: = S;

(4) While (X as not converged)

(5) X : α S +(1- α)P^TX ;

(6) Output X;



6. RESULT and ANALYSIS

Construction and maintenance of overlay networks consists of initial neighbor selection and subsequent replacement of dead links. Our results show that the proposed random-walk method may achieve *any* desired level of resilience without replacing neighbors as long as Pareto shape parameter 1< α < 2 and system size n and T are sufficiently large. This indicates that P2P systems under proposed neighbor selection and very heavy-tailed lifetimes become progressively more resilient over time and asymptotically tend to an "ideal" system that never disconnects as users join the network.

7. CONCLUSION

The proposed techniques, randomized discretization and path delay discretization, to design fast algorithms for computing constrained shortest paths. While the previous approaches (RTF and RTC) build up the discretization error along a path, the new techniques either make the link errors to cancel out each other along the path or treat the path delay as a whole for discretization, which results in much smaller errors. The algorithms based on these techniques run much faster than the best existing algorithm that solves the e–approximation.

8. REFERENCES

[1].J.Broch, D.A.Maltz, D.B.Johnson, Y.C.HU,and J.Jetcheva,"A Performance Comparison of Multi-Hop Wireless Ad Hoc Network Routing Protocols," Proc.ACM MobiCom,PP.85-97,1998.

[2]. B.Karp and H.T. Kung, "GPSR: Greedy Perimeter Stateless Routing for Wireless Networks," Proc.ACM MobiCompp.243-254, 2000.

[3]. E.Rozner, J.Seshadri, Y.Mehta an L.Qiu, "SOAR: Simple Opportunistic Adaptive Routing Protocol for Wireless Mesh pp.1622-1635, Dec.2009

[4]. D.Cen,J.Deng and P.Varshney, "Selection of a Forwarding Area for Contention-Based Geographic Forwarding in wireless Multi-Hop Networks," IEEE Trrans. Mobile Computing, vol.8, no.5, pp.31111-3122, sept.2007.

[5].N.Arad and Y.Shavitt, "Minimizing Recovery State in Geographic Ad Hoc Routing,"IEEE Trans. Mobile Computing, Vol.8, No.2, pp. 203-217, Feb 2009.

[6] S. Biswas and R. Morris, "EXOR: Opportunistic Multi-Hop Routing for Wireless Networks," Proc. ACM SIGCOMM, pp. 133-144, 2005.

[7] S. Chachulski, M. Jennings, S. Katti, and D. Katabi, "Trading Structure for Randomness in Wireless Opportunistic Routing," Proc. ACM SIGCOMM, pp. 169-180, 2007.