RESEARCH ARTICLE

A Priority Analysis Mechanism to Generate Effective Path in Mobile Network

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Abstract— A Mobile network is the public area network that integrates multiples users in a cooperative environment. As the network is adhoc, the communication is performed via intermediate nodes by generating the multi-hop path. As the size of network or the communication increases, the load on this intermediate node also increases. In such case, there is the requirement of some effective mechanism to generate the effective path. In this work, a prioritization approach is defined to identify the next immediate node. The prioritization is here defined under the parameter based analysis. The parameters considered in this work include the communication loss analysis, communication rate analysis and communication delay analysis. These parameters are used collectively as well as individually to generate the effective path over the network. The main aim of this paper is to present a prioritization scheme to generate the reliable and efficient path for mobile network.

Keywords: Prioritization, MANET, Effective Routing, MultiHop

I. INTRODUCTION

A Mobile network is considered as the interconnection network with the specification of communication in public domain. This kind of communication is performed cooperatively by performing the multihop communication over the network. This kind of communication includes the effective and reliable communication along with resource access as well as reduction to the cross communication over the network. This kind of communication is performed under the under the specification of communication parameter analysis as well as by generating the effective network architectures so that the reliable and efficient communication will be performed over the network. This kind of communication includes the capability level improvement over the network as well as to use the available limited resources in an improved form. The absence of centralized device and the restricted memory limits increases the responsibilities of each node so that more effective and reliable communication will be drawn. Another enhancement required in these networks is to perform the paralleled communication so that the response time of data requests will be speed up as well as parallel application execution is possible. These kind of networks also requires the adaptive algorithmic approach respective to the scenario as well as the environment. These environments include the climate based specification such as a classroom scenario specification and routing can be applied to the rescue area networks. Some of these networks also include the energy restriction along the specification of mobile network. In such network, the QoS depends on the energy consumption and network life.

The improvement to the existing routing protocols is also done under these environment and energy adaptive specifications.
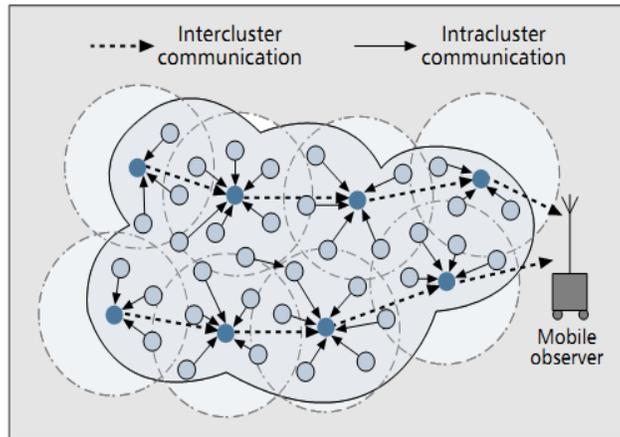

Figure 1 : Mobile Network

As the size of network increases, instead of performing the communication over the global network, a cluster adaptive approach is applied to perform efficient communication over the network. According to this, complete network is divided in smaller segments called clusters and each cluster is controlled by a centralized unit called controller node. The architecture of this hybrid clustered mobile network is shown in figure 1. The nodes present in a cluster, directly communicated with the controller node. Here many-to-one communication is performed and the cluster data is communicated directly to the controller node. Now to perform the communication with other network, these clusters performed the communication cooperatively and transfer data to the network controller. This network controller is able to transform the data and to perform the communication with other networks.

The controller node is here able to handle the multiple requests simultaneously and having the high processing and memory capability. As the requests are handled, these requests are maintained in a queue. This queue is called process queue. The performance of the system depends on the capabilities of this controller node. This controller node is specified with the processing specifications as well as responsibilities. To improve the communication it is required to schedule these requests effectively so that the effective communication will be performed. To define this there are number of scheduling approaches adapted by the researchers. These approaches include the specification of communication parameters and the node prioritization. T

The presented work is about to define the effective routing in a homogeneous or heterogeneous mobile network under the specification of node prioritization. The work is here performed based on the communication parameters analysis. In this section, the description of mobile network and mobile network architecture is defined along with network strengths exploration. In section II, the work defined by earlier researchers is discussed. In section III, the presented algorithmic approach is discussed. In section IV, the conclusion obtained from the work is discussed and presented.

II.   Existing Work

In this section, the work defined by earlier researches is presented and discussed. Sung-Ju Lee[1] has defined a work on the comparative analysis on different mobile network protocols. This comparative analysis is performed for MAC protocols as well as multicast protocols. The comparative analysis is here performed in real wireless environment with vast number of parametric specification including the group size, mobility, multicast, load etc. Author defined the analysis under different load conditions such as the congestion and the collusion situation. The mobility situations are defined under different scenarios and the robustness of the protocols is achieved under the specification of architecture and the mobility specifications. The communication over the network is analyzed under the specifications of increasing scenario specification of cost and parameter specification based analysis. This kind of specification includes the generation of route generation with the network specifications and generations. This kind of network also includes the specification of the network cooperation as well as its eventual estimation so that effective network route will be generated. C-K. Toh[2] has defined a study based on work on two multicast routing protocols for mobile network. Author performed the comparative analysis under the performance and simulation scenario specification. These protocols include the ODMRP and ABAM protocols. The first protocol here is the flooding based protocol that provided the effective throughput even in high mobility scenarios with the

specification of the node memory. ABAM protocol is the associatively based protocol that observe the mobility at earlier stage and later on perform the communication under communication over head and delay analysis. This kind of protocols are effective to provide high throughput under the power and bandwidth specifications.

I.Chatzigiannakis[3] has defined a work on the probability based estimation to perform the network connection and to perform the relative effective communication over the network. This kind of network includes the specification of performance analysis and and network generation with the specification of effective route in hierarchical networks. This kind of networks is specified with the access port specification and port level communication over the mobile network. This network form is also defined with the specification of network communication with hierarchical communication analysis. Chae Young Lee[4] has defined a work on hybrid structure analysis with the tree and mesh communication analysis and network generation. This hybrid structure is defined under the communication specification and analysis under the threshold specification and route generation. This kind of networks is constructed with the specification of holding time and threshold specification. This network is specified with the inclusion of end nodes to reduce the holding time under the threshold limits. S.Kavitha[5] has defined a work on transition probability specification and route generation with the specification of probabilistic rules. The mesh protocol is defined under the control packet communication in periodic way. This specification includes the control packet specification and generation called ODMRF and MAODV specification. This kind of controlled packet communication is also analyzed under the multicast group size and number specification with multicast sources as the effective network feature. This kind of specification is done under the protocol specification and improved performance analysis with the specification of data packet header. This specification is here made with the head associated data packet specification and generation so that the controlled communication will be performed and the control overhead over the nodes will be obtained. This kind of communication includes the control overhead based data packet delivery and the specification of the lesser packet drop over the network.

Pedro M. Rniz[6] has defined a work on the efficient and multicast communication in mobility domain as well as fixed network domain. The communication is here performed beyond 3G network specification and the terminal analysis access and the support specification with bandwidth analysis and network consumption analysis. Author has presented a significant architecture to improve the multicast communication so that the performance of the network will be improved at significant point. This kind of network includes the specification or proper extensions as well as generations with the protocol inter-cooperation analysis and adaptive communication. G. Chelius[7] has presented a multicast routing protocol under the data dissemination specification with radio medium characteristics analysis. This kind of network exploits the intrinsic characteristic analysis to provide the optimization in high density network under the multicast communication. The dense communication is here performed under scalability and tree structure analysis. This structural analysis includes the redundant link generation and specification without forwarding the delegation of the effective communication approach. The zone based communication approach is defined to improve the network communication and to improve the communication architecture. The work is here defined to generate the quality path under the computation and robust communication with the specification of analytical route generation. The dense communication analysis and the connecting path generation is here performed to improve the robustness and efficiency of the network so that the effective deployment of network will be obtained. J. Ye[8] has presented a power oriented multicast routing algorithm to save the power consumption and to improve the communication power and cost. This kind of network includes the interference control analysis with average hop count based analysis for tree based architecture. Author defined a joint power saving and path efficiency.

Habib Ammari [9] has defined a work on multicast routing protocol for mobile network. Author defined the work for planner region specification and specification of GPS system. Author analyzed the network structure using Voronoi diagrams in a selection and restrictive way so that the effective packet forwarding over the mobile network will be done. Author defined a work on multicast specification and range limit so that the effective network communication will be performed. Author presented the work under the specification communication and mobility pattern analysis. Steffen Blodt[10] has defined P2P communication in mobile network. Author specified the improvement to existing NICE protocol to improve the network performance and efficiency. Author defined the work under the topological specification so that the improvement to the system will be obtained. Author defined the arbitrary specification and overlay with file sharing specification.

III.   PROPOSED WORK

The presented work is about to generate an effective for a homogenous or heterogeneous mobile network. The work is here defined to generate the effective routing under parameter based analysis for mobile network. This analysis is here performed to analyze the eligibility of a node to set it as next neighbor. This eligibility analysis is here performed under different parameters. The parameters considered in this work are communication loss analysis, communication delay analysis and communication rate

analysis. Based on the individual and collective analysis on each node, the priority of a node is decided. The priority of a node is here defined under high, medium and low constraint. The neighbor node with high priority is considered here as the effective next hop that can provide the effective throughput for the communication. The parameters considered in this work are shown in figure 2.
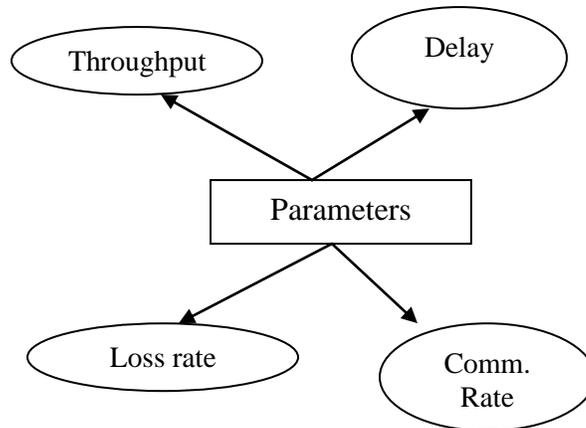

Figure 2 : Communication Parameters

The work is here defined for a random network scenario with static or mobile network. The network is defined with N number of nodes. The specification of source and destination nodes is given. The AODV protocol is set as the on demand protocol to generate the list of neighbor nodes. The communication begins with the specification of source and destination node with inclusion of communication parameters. As the communication begins, the source node is set as the current node. On this current node, the list of neighboring nodes is generated under the protocol capabilities. Once the neighbor nodes are identified, the analysis on these neighbor nodes is done under different parameters. These parameters are described in figure 2. These parameters are analyzed under the given algorithmic approach and based on this analysis; the priority to all the neighboring nodes is identified. The priority given to the nodes can be high, medium or low priority. The high priority node is considered as the most effective and reliable node to perform he communication. This process of identifying the next hop is repeated till the destination node is not achieved. The algorithmic approach defined for this work is shown in table 1.

Table 1 : Algorithm

```
Algorithm()
{
    1.  Generate the network with N Mobile Nodes with
        the specification of node position and random
        mobility
    2.  Specify the source node Src and Destination
        Node Dst for mobile network.
    3.  Set Cur=Src
        [Set the Source Node as Current Node]
    4.  While (Cur <> Dst)
        [Generate the network path nodes till the
        destination node not occur]
        {
    5.  Generate the Neighbor Node list for Cur called
        Neigh
    6.  For i=1 to Neigh.Length
        [Real All Neighbors]
        {
    7.  If (Throughput(Neigh(i)) =High And
        Lossrate(Neigh(i))=Low And
        Delay(Neigh(i))=Low and
```

```
    CommRate(Cur)=High)
    {
8.  Set Neigh(i).Priority=High
    }
9.  Else If (Throughput(Neigh(i)) =High And
    Lossrate(Neigh(i))=Low And
    Delay(Neigh(i))=Low)
    {
10. Set Neigh(i).Priority=High
    }
11. Else If (CommRate(Neigh(i)) =High And
    Lossrate(Neigh(i))=Low And
    Delay(Neigh(i))=Low)
    {
12. Set Neigh(i).Priority=High
    }
13. Else If (CommRate(Neigh(i)) =High And
    Lossrate(Neigh(i))=Low And
    Delay(Neigh(i))=High)
    {
14. Set Neigh(i).Priority=Medium
    }
15. Else If (Throughput(Neigh(i)) =High And
    Lossrate(Neigh(i))=Low And
    CommRate(Neigh(i))=Low)
    {
16. Set Neigh(i).Priority=Medium
    }
17. Else
    {
18. Set Neigh(i).Priority=Low
    }
    }
19. Order the Neigh List based on Priority
20. Set Cur=Neigh(i)
    }
21. Exit
}
```

IV. CONCLUSION

In this paper, an improved prioritization mechanism is defined to generate the network path. The prioritization is here defined based on the communication parameters. These parameters include throughput, communication rate, communication loss and delay. These parameters are used individually and collectively to assign priority to the nodes. Based on this priority analysis, the high priority node is identifying as the next hop to the communication.

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