International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2017 IJSRCSEIT | Volume 2 | Issue 2 | ISSN : 2456-3307

A Probabilistic tactic for Replacement of Failed nodes in Mobile Wireless Network

A. Flora Janath, P. Gayathri
Department of Computer Science and Engineering, IFET College of Engineering, Villupuram, Tamil Nadu, India

ABSTRACT

The process of detecting the failed or damaged nodes in the wireless network is too complex due to its dynamic topology and presenting of huge number of nodes in it. Sometimes the connection may get loss during the time of detection, it makes us to put in the difficult position. In order to reduce these complexity and difficulties, we approach the probabilistic tactic to replace the failed node with good node to induce the transmission of data and reduce the time complexity during the time of communication. Where it is contributed to achieve the good communication to reach the receiver side in order to deliver the data from the sender.

Keywords : Node, Failure, Heartbeat Message, Node Replacement

I. INTRODUCTION

The term of wireless networks are essential for the many applications such as search and rescue, military operation as well as the disaster relief. Sometime the detection may get failure due to poor battery capacity. Similarly the node detection perspective is very challenging due to the dynamic topology (environment). Then the data transfer in static topology is not much convenient due to limited resources, limited accessibility and limited communication for the particular criteria in the topology, so we are approaching the dynamic topology for the purpose of transferring of various files from sender to receiver [3]. These approaches can be handled by receiving "heart beat messages" from the head node or the centralized node. If the heartbeat message from the various nodes are not intimated to the centralized node, that node will be consider to be failed or timed out.

II. METHODS AND MATERIAL

Existing System

The existing system of this approach would be adopted by the theme of centralized monitoring, which would be based on the heart beat messages. It expects every node to send the heart beat message to the centralized monitoring node in it, if the node fails to send the heart beat message to that centralized monitoring node then it will be considered as the failed node. Which is only applicable to the persistent connectivity, by assuming various preferred paths in it. Another approach could be based on the localized monitoring, there nodes broadcast heartbeat messages to their one-hop neighbors and nodes in the neighbors monitor each other through heartbeat messages. Localized monitoring only generates the localized traffic and has been used for node failure detection in static networks.

Disadvantages of Existing System

These network system will contribute more amount of the traffic in network wide. When being applied in mobile networks, it suffers the redundancy, duplication and inherent ambiguities with some of the neighbor nodes in that specific topology. Sometimes the time complexity will be arose and the space complexity arise due to the duplicate nodes present in that wide environment.

Proposed System

In this node detection perspectives, we have proposed the replacement of the neighbor node with the failed nodes. So that we have introduce the four different modules to detect the failed nodes and to replace that

position with the neighbor node. They are localized monitoring, location estimation module, node collaboration module and finally node replacement module.

i) Localized Monitoring

Localized monitoring only generates localized traffic, because of presence of n-number of node in that dynamic topology, so there will be some confusion will be occur in it. To clear that problems the localized monitoring module can be used frequently in it. It has been used successfully for node failure detection in static networks as well as in the dynamic networks.

ii) Location Estimation Module

By localized monitoring, Node only knows that it can no longer hear from other neighbor nodes, but does not know whether the lack of messages is due to node failure [2] or node moving out of the transmission range. Location estimation is helpful to resolve this ambiguity.

iii) Node Collaboration Module

Through this module, we can enhance the conclusion which are taken during module ii. Where the node can be move towards the destination, so the correct decision will be taken during this collaboration module. And the right path will be chosen by using this node collaboration module forever.

iv) Node Replacement Module

This module is used, for the purpose of replacement of the failed nodes in that topology. If the head node failed to get the heartbeat message from the consecutive node. Detect and replace the node by using two phase method: 1.The former is search of redundant nodes using the cluster heads, which requires the network division into a set of clusters where each one designates a node to be their representatives.2. Restoration of connectivity.

Tactic of Probabilistic Approach

The timing perspective is used for the purpose of calculating the failure. The failure can be detected by baye's rule with the time constraint t. Then the location of the node at time t can be modeled as

$$H = \begin{matrix} 1 & 0 & 0 \\ 0 & 0 & 1 \end{matrix}$$

With the help of these matrix value, we can obtain the predicted values of failed nodes. Then the distance can be find between two nodes are Where the matrix value 1 represents the possibility of occurring of failure in the nearest node of it. Then the 0 represents that there is no failure has been seen, then all the data are correctly transferred from one place to another without any restriction. In order to detect the failure, where the distance has to be measured in it. The measurement is based on the distance and coordinates of the each node located in the every position of it.

$$D=\sqrt{(x1-x2)^2+(y1-y2)^2}$$

Here, x1 denotes the first coordinate of the plot of the node and y1 denotes the second coordinate of the same node. Similarly, x2 represents the first coordinate of the second considered node and y2 represents the second coordinate of the same node. So, the maximum distance can be found, and the two phase methodology can be implemented by using this.

III. RESULTS AND DISCUSSION

System Architecture

The system configuration is determined in fig.1 given below. If the node is out of the range, it is not considered to send the data in that. Instead of that, the neighbor node will define the shortest node present near of it.

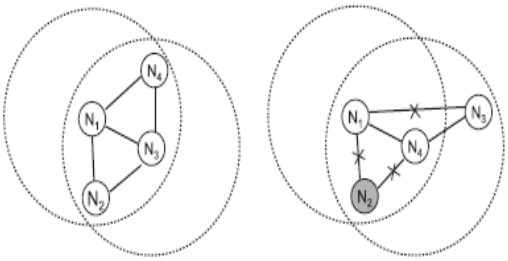

Figure 1

The node N1, N2, N3 and N4 are depicted in the system architecture, where the node N3 is out of the range and the node N2 is getting failed, so the N1 node

preferred N4 as the replaced node to transfer the data soon.

Performance Measure

These performance can be simulated by using matlab software, ns2 or ns3 And also it can implemented by using node failure detection algorithm [4]. They can be evaluated with three schemes of mobility models in nodes. Which are random waypoint model, the smooth random model and levy walk model? The random waypoint model is used for network connectivity, smooth random model is used for mobility of hops and the levy walk model is used for measuring the node movement distance.

IV.CONCLUSION

The probabilistic approach can be done for co-ordinating the localized monitoring, location estimation, node collaboration and the node replacement. From this the highly failure can be detected and taken steps to enhance the good communication with induce the mobility with it. The complexity of time and space can be reduced in these topologies. And also the reliable communication has been enhanced in it without any problem using this methodology.

V. REFERENCES

[1]. Qian Liu, Yang Yang, Qiu Xue-song "A Metric-Correlation-Based Fault Detection Approach Using Clustering Analysis in Wireless Sensor Networks". March 2015

[2]. Carlos O. Rolim, Valderi Leithardt, Guilherme A. Borges "A new unreliable failure detector for self-healing in ubiquitous environments". April 2015.

[3]. Min Shen, Ajay D. Kshemkalyani "A Fault-Tolerant Strong Conjunctive Predicate Detection Algorithm for Large-Scale Networks". March 2013.

[4]. Venkatraman Iyer, Qingzhi Liu, Stefan Dulman, Koen Langendoen "Adaptive Online Estimation of Temporal Connectivity in Dynamic Wireless Networks" March 2013