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Voice over Internet Protocol in Distributed Environment Using MANETs

Josvin Wesley A.V [1], Dr.Amutharaj.J [2]

P.G Scholar, Dept of M.E. (Computer Science and Engineering), Alpha College of Engineering, Chennai, Tamilnadu, India. [1]

Head of the Department, Dept of M.E. (Computer Science and Engineering), Alpha College of Engineering, Chennai, Tamilnadu, India. [2]

Abstract:- Mobile ad-hoc network is one of the most promising fields for research and development of wireless network. Mobile Ad hoc Networks are based on a peer to peer approach, each nodes participates in the organization of the whole network. Voice Over Internet Protocol over Mobile Ad-hoc Network is a challenging issue due to the intrinsic distributed nature of the existing peer to peer paradigm. A new protocol, capable of ensuring a Quality of Service level for Voice Over Internet Protocol calls over a Mobile Ad hoc network and to manage a higher number of calls in the system. Novel metric function is proposed to perform the best path selection from source to destination nodes, respecting the Quality of Service parameters for VoIP quality. Voice over IP is a methodology and group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol networks. Finding the low cast path from source to destination and dynamic path selection strategy, in order to guarantee the best quality for new incoming calls, without degrading system performance.

Keywords:- VoIP, MANET, QoS, distributed architecture, peer-to-peer, IP-telephony, hostile environments.

I.INTRODUCTION

Nowadays, an increasing number of people use wireless applications and VoIP, in order to make good quality and low cost calls. Typically, wireless technology is used only on the network segment that connects the end user with the wireless interface, which forwards wireless packets to a wired backbone. Unfortunately, the employment of an infrastructure is often not possible in a distributed scenario, because classical QoS metrics may cause congestion or service disruption. An objective route selection metric based on the E-Model is proposed, together with a suitable flexibility-based route ordering. The final goal is to overcome drawbacks typical of traditional approaches in routing strategies applied to distributed wireless systems, and to offer good call quality, even in dynamic and distributed networks.

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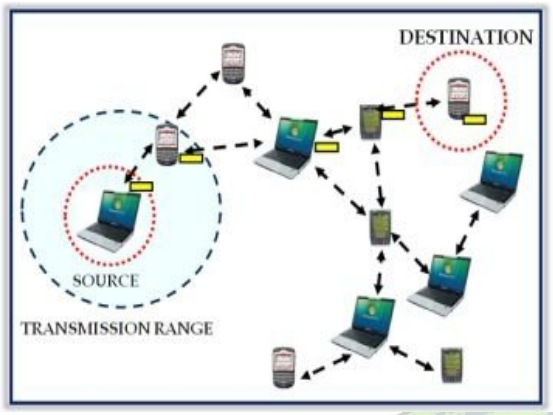

Fig:1.1:System Analysis

II. PRELIMINARIES AND RELATED WORK

An analysis of currently used VoIP systems shows how they are characterized by a set of fixed nodes, which act as intermediaries between their endpoints or provide registration and localization of nodes. The situation degrades when hostile areas where an infrastructure cannot be employed are considered. Traditional VoIP structures become inadequate, because of the need for different fixed nodes. If it is consider a scenario with close endpoints and a far proxy then, without an infrastructure, the Qos levels become unacceptable, although a multi-hop protocol may forward the information to the proxy, the degradation introduced by each hop determines that constraints on the Mean Opinion Score (MOS) are not respected, with consequent low quality admitted calls.

2.1. SUBJECTIVE AND OBJECTIVE QOS EVALUATION

Subjective measurements of the Qos are carried out by a group of people. A test phrase is recorded and, then, test subjects listen to it in different conditions. These tests are performed in special rooms, with background noise and other environmental factors, that are kept controlled for test executions. Some examples are conversational opinion test, listening opinion test, and interview and survey test. The subjects have to report their opinion on a scale chosen among those recommended by ITU -T, and the arithmetic mean of these results, called the Mean Conversation-opinion Score (MOS), is computed and evaluated. Once the absence of anomalies is verified, it is possible to continue with the next experiment. The subjective methods are not practicable during the network planning phase because they are limited, impracticable and too expensive. In order to avoid these problems, new methods that permit the calculation of values representing the different damaging factor combinations of the network have been developed.

2.2. LEXICOGRAPHIC ORDERING PATH SELECTION

Our proposal is based on an extension of the SIP protocol, due to its robustness and broad diffusion. A distributed scenario has been considered, each node can communicate with its neighbors has a direct radio coverage in the considered environment and, if a remote communication is requested, a multi-hop path is mandatory, so a key issue is the discovery of neighbor nodes. The problem can be simply avoided by using Hello packets: when a node receives a Hello packet, containing the identity of neighbour nodes, it can easily identify the nodes under its coverage.

2.3. E-MODEL BASED METRIC

The section criterion used by the system to choose the best path will be described. The traditional choice made by several routing protocols is based on the shortest path from source to destination. For the considered systems, such kind of choice is unsuitable, because of the possible existence of bottlenecks in the system, with a consequent reduction in the number of admitted calls and a Qos degradation of the active VoIP flows. To manage a new call properly, the link between source and destination must be bidirectional: forwarding protocols belonging to the OLSR family put tags on the links from anode to its neighbors, in order to know if it is unidirectional or bidirectional. Each node inserts the list of its neighbors in the Hello packet that it is going to send: when a node finds its identity in the received Hello packet, it can tag the link with its neighbor as

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bidirectional. Note that only bidirectional links are stored in the routing table.

III. PERFORMANCE EVALUATION

The Solution is based on a novel metric related to an objective measure of the Qos for calls and on optimal codec selection in the route discovery phase of the wireless routing protocols for MANET, Each node behaves actively and passively for routing operations. The new functionalities of the proposed system are managing the construction of the lowest cost path from source to destination in the best way on the basis of an objective measure of the Qos of the calls. Dynamic codec selection strategy, in order to guarantee the best quality for new incoming calls.

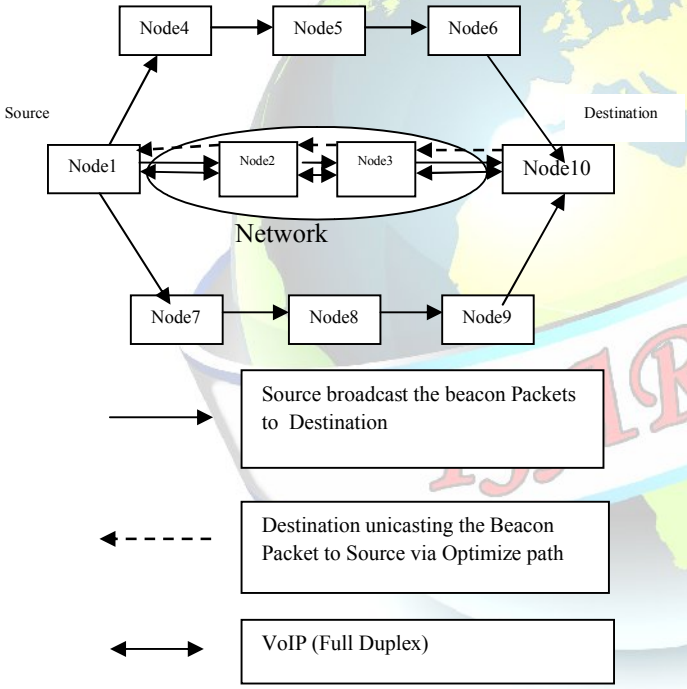

Fig:3.1.System Architecture

The new functionalities of the system are, Managing the construction of the lowest-cost path from source to destination in the best way on the basis of an objective measure of the QoS of the calls. Dynamic codec selection strategy, in order to guarantee the best quality for new incoming calls, without degrading system performance. Call admission control procedure integrated in the route selection, to refuse or direct on alternative paths the additional calls that can degrade the VoIP QoS constraints. Route selection based on a suitable flexibility index, which allows the system to maximize the number of admissible new calls with the available resources, and hence to scale with the network size increase.

3.1. R Value and Mean Opinion Score

It is used in the Voice Testing Process, It is a metric range from lowest to highest (1 to 100), It is based on the users, who are satisfied with the quality of a Voice Signal after it has passed through a network from a source to a destination. Mean Opinion Score is mostly used in the Perceptual Evaluation of Speech Quality.

1 MOS = 20 R Value

R =100 - Is – Id –Ief + A

3.2. Network Formation

Each node sends message to other nodes which allows detecting it. Once a node detects message from another node (neighbour), it maintains a contact record to store information about the neighbour. Using multicast socket, all nodes are used to detect the neighbour nodes. Creation node of the Range is less than the distance.

Range < Distance

Mobility = Dynamic Value

3.3. Optimizing path selection

The shortest path to transmit data from source node to destination node. Source makes the request, the terminal broadcasts the packet. All neighbours will receive and forward request. Sooner the request will be received by the destination, which will set a timer for the receipt of other Challenge packets generated by the same source. When the timer expires, node destination will elaborate all received requests and will reply only to the best Challenge request.

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3.4. Distortion less Secure Communication

Choosing alternate path when there is any distortion or signal problem between two users. Distortion will be occurs based on mobility. The case only dynamic path will choose. After finding dynamic path, communication will be performed securely.Choosing alternate path when there is any distortion or signal problem between two users. Distortion will be occurs based on mobility. In it case only dynamic path will choose. After finding dynamic path, communication will be performed securely. Voice over IP is a methodology and group of technologies for the delivery of voice communications and multimedia sessions over Internet Protocol networks.

IV. CONCLUSION

Mobile ad hoc Network has been established by creating more than five nodes. The main goal is increases the number of admitted calls in the system. It has verified by analyzing the average MOS value. Which have always been higher than the one obtained with a classical approach, based on the hop count. Future work, A sends fake routing information, that it has an optimum path and causes other good nodes to route data packets through the malicious one. A malicious node drops all packets that it receives instead of normally forwarding those packets. An attacker listen the requests based on flooding protocol.

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