International Journal of Research (IJR)
e-ISSN: 2348-6848, p- ISSN: 2348-795X Volume 2, Issue 09, September 2015
Available at http://internationaljournalofresearch.org

The Novel HWN on MANET Cellular networks using QoS & QOD

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Abstract: -

This paper gives survey of existing Quality of service QoS oriented routing algorithms for hybrid wireless networks. HWN are integrated networks that provide seamless services over several networks. HWN integrate infrastructure networks and Mobile adhoc networks. So HWN are the next generation 4G networks. The emerging multimedia applications like online movie, online video conferencing, etc. require high support of QoS networks. Hence the stringent end to end network quality is on demand research. QoS routing is an important research issue in MANET, especially for mission-critical monitoring and surveillance systems which requires timely and reliable data delivery. As wireless communication gains popularity, significant research has been concerned to supporting real-time communication with stringent Quality of Service (QoS) requirements for wireless applications. At the same time, the wireless hybrid networks that accommodates a Mobile Ad hoc Network (MANET) and a wireless infrastructure network has been proven to be a better alternative for the next generation wireless networks. By directly taking resource reservation-based QoS routing for MANETs, hybrids networks derive invalid reservation and race condition problems in MANETs. The QoS-Oriented Distributed routing protocol (QOD) to enhance the QoS support capability of hybrid networks. QOD alter the packet routing problem to a resource scheduling problem.

Keywords: -Hybrid wireless network; MANET; Cellular networks; QoS; QOD

1. INTRODUCTION

The number of wireless Internet users are tripled world-wide in the last years[1].Also Wi-Fi capable mobile devices including laptops and handheld devices like smartphone and tablet PC are increasing rapidly. Users wish to be always online and watch videos, play games, watch TV, make long distance conferencing via wireless mobile devices. This paper design a QoS Oriented Distributed routing protocol (QOD) to enhance the QoS support capability of hybrid Networks. The data transmission in hybrid networks has two features. First, an AP can be a source or a destination to any mobile node that allows any cast transmission. Second, the number of transmission hops between a mobile node and an AP is small that is at most two-hop from source to AP through intermediate node. QOD has total six algorithms to achieve QoS. With the iniquitousness and arrival of wireless technology, a wide range of modern services are expected to be assisted including the appealing and attractive services that currently exist in wired systems. The fast development of wireless networks has stimulated various wireless applications that have been used in wide areas of commerce, military, emergency services and entertainment. The need for high Quality of Service (QoS) support in wireless and mobile networking environments have been increased due

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to the emergence and the envisioned future of real time and multimedia applications [1]. The QoS support minimizes end-to-end transmission delay and enhances throughput to ensure consistent, coherent and smooth communication between mobile devices and wireless infrastructures. A routing protocol for hybrid wireless networks should have the following characteristics 1) It must be fully distributed. 2) It must be adaptive to dynamic topology changes caused by the mobility of nodes. 3) Route computation and maintenance must involve a minimum number of nodes. 4) It must avoid invalid routes reservation problem. 5) It must avoid race condition problems for resources.6) The number of packet collision must be kept to a minimum.7) It must optimally use resources like bandwidth, computing power, memory and battery power. 8) It should take advantage of available resources like base stations and multi interface feature of mobile nodes .9) It should be able to provide QoS demanded by the applications.

2. RELATED WORK

Existing system:

Hybrid wireless networks (i.e., multi-hop cellular networks) have been proven to be a better network structure for the next generation wireless networks and can help to tackle the stringent end-to-end QoS requirements of different applications. Hybrid networks synergistically combine infrastructure networks and MANETs to leverage each other. Specifically, infrastructure networks improve the scalability of MANETs, while MANETs automatically establish self-organizing networks, extending the coverage of the infrastructure networks. In a vehicle opportunistic access network (an instance of hybrid networks), people in vehicles need to upload or download videos from remote Internet servers through access points (APs) (i.e., base stations) spreading out in a city. Since it is unlikely that the base stations cover the entire city to maintain sufficiently strong signal everywhere to support an application requiring high link rates, the vehicles themselves can form a MANET to extend the coverage of the base stations, providing continuous network connections.

Disadvantages of existing system:

Difficult to guarantee QoS in MANETs due to their unique features including user mobility, channel variance errors, and limited bandwidth.

Although these protocols can increase the QoS of the MANETs to a certain extent, they suffer from invalid reservation and race condition problems.

Proposed system:

In order to enhance the QoS support capability of hybrid networks, in this paper, we propose a QoS-Oriented Distributed routing protocol (QOD). Usually, a hybrid network has widespread base stations. The data transmission in hybrid networks has two features. First, an AP can be a source or a destination to any mobile node. Second, the number of transmission hops between a mobile node and an AP is small. The first feature allows a stream to have any cast transmission along multiple transmission paths to its destination through base stations, and the second feature enables a source node to connect to an AP through an intermediate node.

Advantages of proposed system:

The source node schedules the packet streams to neighbours based on their queuing condition, channel condition, and mobility, aiming to reduce transmission time and increase network capacity.

Taking full advantage of the two features, QOD transforms the packet routing problem into a dynamic resource scheduling problem.

The network model of the Hybrid networks

In order to enhance the QoS support capability of hybrid networks, we propose a QoS-Oriented

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Distributed routing protocol (QOD). Commonly, a hybrid network has widespread base stations. The data forwards in hybrid networks have two features. First, an Access Point can be act as a sender or a receiver to any mobile node. Next, the number of transmission hops between a mobile node and an Access Point is small. The first feature allows a stream to have any cast transmission along multiple transmission paths to its destination through base stations, and the second feature enables a sender node to connect to an Access Point through an intermediate node. The source node allocates the packet streams to neighbors based on their channel condition, queuing condition, and mobility, aiming to increase network capacity and reduce transmission time and It's have less time delay on transmission between the nodes of wireless communication Here QOD can provide high QoS performance in terms of overhead scalability , mobility-resilience and .transmission delay.

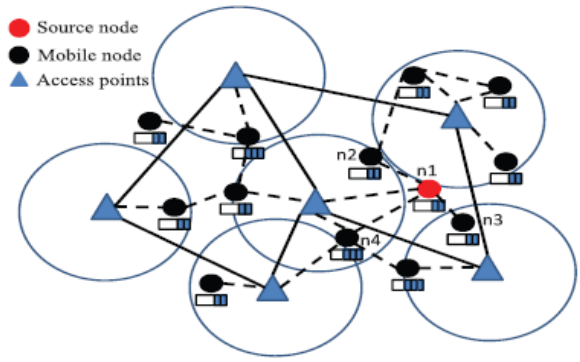

Fig: - System Architecture.

3. IMPLEMENTATION

Qos-guaranteed neighbor selection algorithm

The qualified neighbors are selected and deadline-driven scheduling mechanism is used to guarantee QoS routing Scheduling feasibility. Which is considered as the ability of a node to guarantee a packet to arrive at its destination within QoS requirements? When the QoS of the direct transmission between a source node and an Access Point cannot be guaranteed, A request message is send to its neighbor nodes from the source node. The neighbor node n with space utility less than a threshold replies the source node, the reply message contains information about available Space for checking packet scheduling feasibility. The selected neighbor nodes periodically report their status to the source node, here the scheduling feasibility is ensured and locally schedules the packet stream to them. The each packets are transmitted to the neighbor nodes that schedule in a round-robin fashion from a longer delayed node to a shorter delayed node, and it's focused to reduce the packet transmission delay.

Distributed packet scheduling algorithm

The Distributed packet scheduling algorithm, after qualified neighbors are identified. It assigns earlier generated packets to forwarders with higher queuing delays, when more recently generated packets are assigned to forwarders with lower queuing delays in order to reduce total transmission delay. The distributed scheduling algorithm is selected as mediator nodes can guarantee the QoS of the packet transmission to ensure their scheduling feasibility. Stream transmission time is reduced further; a distributed packet scheduling algorithm is used for packet routing. Packets that are generated earlier is assigned to forwarders with higher queuing delays, while assigns more recently generated packets to forwarders with lower queuing delays and scheduling feasibility, so that the transmission delay of an entire packet stream can be reduced, an mediator node assigns the highest priority to the packet with the closest deadline and the packet with the highest priority is forwarded first. A mediator node can determine the priorities of its packets based on their deadlines.

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Mobility-based segment resizing algorithm

Each packet is adaptively resized in its packet stream for each neighbor node according to the neighbor's mobility in order to increase the scheduling feasibility of the packets from the source node. The transmission link between two nodes is frequently broken down, in a highly dynamic mobile wireless network. The delay generated in the packet retransmission degrades the QoS of the transmission of a packet stream. On the other hand, a node in a highly dynamic network has higher probability to meet different mobile nodes and Access Points, which is beneficial to resource allocating, the space utility of an mediator node that is used for forwarding a packet, reduce packet size which increases the scheduling feasibility of an mediator node and reduce packet dropping probability. However, the size of the packet cannot be made too small because it generates more packets to be transmitted, producing higher packet overhead. By taking the advantage of node mobility, a mobility-based packet resizing algorithm is used for QOD. Here the basic idea is that the larger size packets are assigned to lower mobility mediator nodes and smaller size packets are assigned to higher mobility mediator nodes, which increases the QoS-guaranteed packet transmissions.

4. EXPERIMENTAL RESULT

Comparison For comparison we are going to use two parameters Packet Delay and Delivery rate. Delay is, we show how much time required reaching at destination before deadline. And the delivery rate is how many packets we are going to send and how many of them are reached with better QoS performance. Contribution work increases the delivery rate upto 25 % and decreases delay up to 30 %

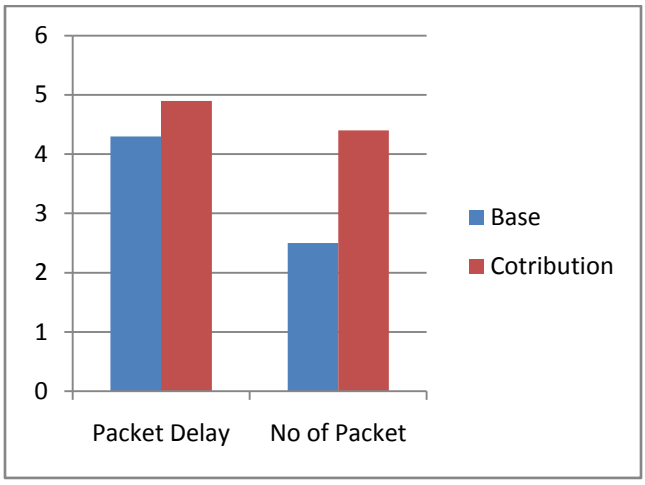

Fig:-2 comparison between Base & Contribution Based on Packet Delay & No Of Packets

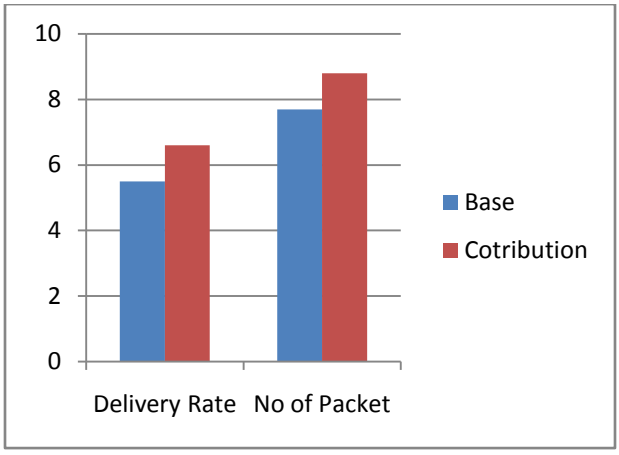

Fig:-2 comparison between Base & Contribution Based on Delivery & No of Packets

5. CONCLUSION

This survey gives study of quality of service requirements of hybrid wireless networks. The existing routing algorithms are not fully focusing on whole properties of hybrid wireless networks. The algorithms for MANETs are having drawbacks like invalid reservation problem and race condition problem. The most routing for hybrid is for network capacity. Hybrid wireless networks that integrate MANETs and infrastructure wireless networks have proven to be a better network structure for the next generation networks. However, little effort has been devoted to supporting QoS routing in hybrid networks.

Direct adoption of the QoS routing techniques in MANETs into hybrid networks inherits their drawbacks. In this paper, we propose a QoS oriented distributed routing protocol (QOD) for hybrid networks to provide QoS services in a highly dynamic scenario. Taking advantage of the unique features of hybrid networks, i.e., any cast transmission and short transmission hops, QOD transforms the packet routing problem to a packet scheduling problem. In QOD, a source node directly transmits packets to an Access Point if the direct transmission can guarantee the QoS of the traffic.QOD incorporates five algorithms: 1) Neighbor selection algorithm to meet the transmission delay requirement, 2)Distributed packet scheduling algorithm to further reduce transmission delay, 3) Mobility-based segment resizing algorithm to adaptively adjusts segment size according to node mobility in order to reduce transmission time, 4)Traffic redundant elimination algorithm to increase the transmission throughput, and 5)Data redundancy elimination algorithm to eliminate the redundant data to further improve the transmission QoS.

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