A review of MANET: Several issues in routing protocol

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Abstract: The main purpose of the Ad-hoc Network is to establish a proper and efficient way to create infrastructure less network using different kind of wireless nodes. In which routing play an important role to find out route between nodes. Therefore several issues can affect the performance of routing in which route arrangements is one of concern it should be made at minimal cost and use of the minimum bandwidth. This article provides an overview of various issues and challenges in various protocols. This paper provides the basic issues, application of MANET and investigating working of different kind of routing protocols.

Keywords: **MANET, Routing protocols, AODV, DSDV, Application, *Design issues.***

1. INTRODUCTION

Collection of wireless nodes configured to create an unreliably independent network has created an infrastructure called Ad-hoc, a mobile network (MANET). They can be set as a collection of mobile nodes that are interconnected on a conventional wireless network. A node entered or exited the network was sent capability that allowed them to create a multi-linkable path, connecting the nodes that was not in the radio range. The nature of the hardware, such as the lack of fixed network infrastructure, network dynamic configuration, the mobility of nodes, and the frequency of incidents of battery power consumption, etc., from other wireless networks. Therefore, the transmission has become the most challenging task. Route is the process of selecting a route in a network for sending network traffic. network infrastructure are repairs, network dynamic configurations, node Traffic in Ad-hoc networks differs from conventional cable networks. Heavy loads on mobile-computing devices make use of a traditional transfer protocol in the network has a dynamic disruption. so, the need for a new design, a smooth navigation protocol adapts to the change of network topology that is inevitable. The characteristics of any movements and often node failures, low battery, etc. to distinguish them from other wireless networks. So, the necessity of evolving into a new guide with a protocol that is easy to adapt to changing the network topology is inevitable [1].

Ad-hoc mobile networks are needed if the infrastructure is not yet available or is difficult to create. They are suitable in case of a disaster, recovery, search and rescue in remote areas, battlefields, patient tracking, Bluetooth, sensors, analysis of the evolution of the cyclone, the discovery of an earthquake, an interactive museum or a toy that provides safety in public buildings, such as the installation of the network [2].

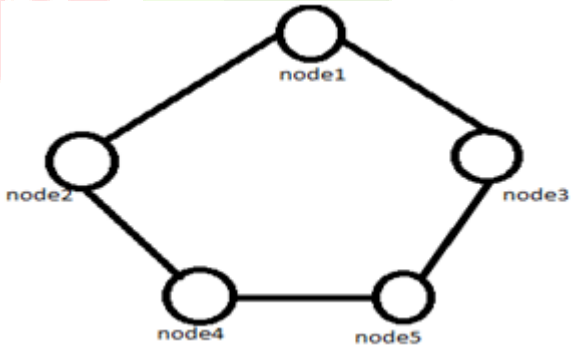


Figure 1: Mobile Adhoc Network

Each node acts as a router and uploads data packets to MANETS. The node can move by chance. On the network grid, the most important network factor is the ability to manipulate itself to adapt to the dynamic state and interoperability between the nodes shown in figure 1.

In next sections, this document is based on a review of adhoc network, other routing related issues and provides brief introduction of routing protocols. This article also presents an overview of problems of different protocols.

2. Mobile Ad Hoc Network Routing Protocols

Mobile Ad-hoc network help facilitate the users to communicate without any infrastructure. MANET supports different type of routing protocols shown in figure 2. Descriptions of each protocol are given below.[3]

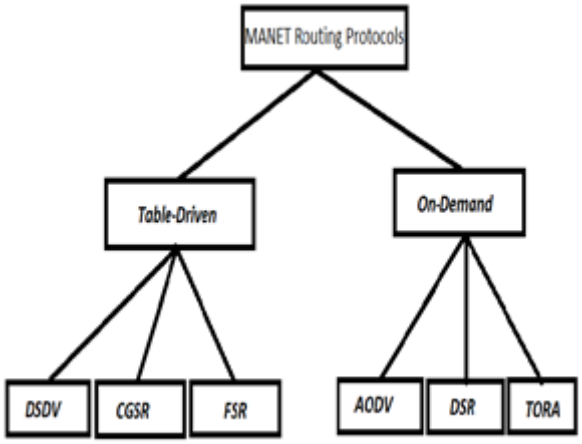


Figure 2: MANET Routing Protocols

2.1 Table-Driven Protocol

Each of the protocols sent through each node table, one or more lines of information transmitted to another node in the network. Update all these tables to keep up to date and latest date views of all nodes network. When changing network configurations, message nodes are up-to-date throughout the network. Certain aspects of the protocol of this transmission include how information is shared, how the shapes changed, and the number of rows needed for transmission. The section below explains these routing protocols. [4]

2.1.1 Destination-Sequence Distance–Vector Routing Protocol (DSDV)

Destination-Sequence Distance–Vector routing protocol is founded on the concept of 'Bellman ford' transmission. Each mobile base supports street charts that include all available destinations; a number of hops are required to reach the target and the order of numbers corresponding to the target. Order numbers are usage to mark new route of the old route and to fine out the formation of the band. In this stage, post their guiding tables as an alternative to their immediate neighbours. The tables have been updated, usually in two new, gradual and gradual improvements. Each package of roads increases the transmission. This protocol has periodic updates but also generates additional traffic added to real data traffic. [5]

2.1.2 Cluster Head Gateway Switch Routing Protocol (CGSR)

This protocol is based on a DSDV routing algorithm. The mobile nodes are collected in the package and the cluster header is selected. The gateway node has nodes in the relationship range between two or more bundles. In a dynamic network, this cluster head concept may reduce the effect obtained from the selection of the cluster header. So the CGSR uses an algorithm to change the last cluster or LCC.

The LCC, a cluster head shift, is done when the change in the network. In this state sends the original packages to his head cluster. The cluster header sends this package to the gateway node and it is the node that is the destination link. The gateway sent this packet to another cluster header and continues until this cluster leader does not get the target node. Ultimately, this headquarters cluster ship packets to this target node. [6] [7] [8]

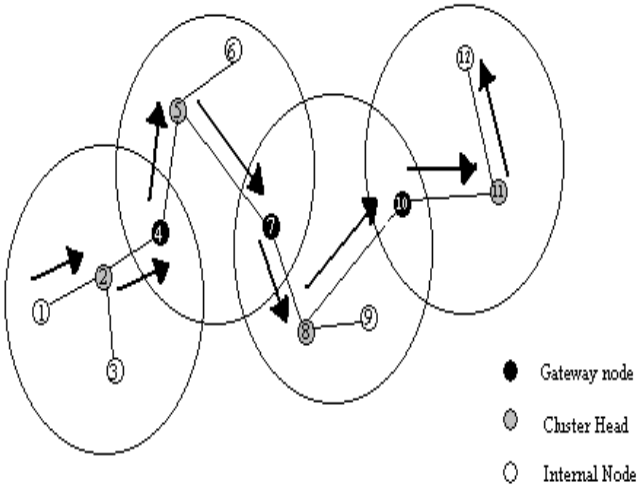


Figure3: Example of CGSR routing from node 1 to node 12

2.1.3 Fisheye State Routing Protocol (FSR protocol)

In FSR, update messages do not include all nodes. Rather, it deals with a node that is next to a higher frequency, not much more distant, with nodes that help reduce the size of the updated message. So each node has a right approximation of the neighbour-hood and the detail and accuracy of the decrease when the distance between the two nodes increases. Picture on figure sets the area for the eye of the central node fish that is shown in red.

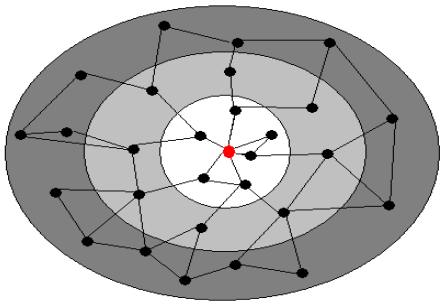


Figure4: Accuracy of information in FSR protocol

Necessary central this node knows more about nodes that are located in the horizontal. FSR for many networks since in this method the burden is managed. [9]

2.2 On-Demand Protocol

Compared with the sending protocols, all update paths are not maintained at each node in the group of protocols; Instead of the road was built only when. If a node wants to send something to a destination, it makes a request to a destination for a path detection mechanism. For this reason, this type of protocol is known as an activation protocol once. This route is in force as long as the target is available. This section describes some of the transmission protocols on demand. [4]

2.2.1 Ad-Hoc On- Demand Distance Vector Routing Protocol (AODV)

This protocol can be viewed as an enhanced DSDV. AODV reduces the number of shares, generating routes on demand. Instead, the DSDV keeps a list of all paths to find the path to your destination, if the origin of the package post a route proposal to all nodes. Neighbours in neighbouring countries pack their packages until the package reaches the middle node to the new highway for this goal. [10]

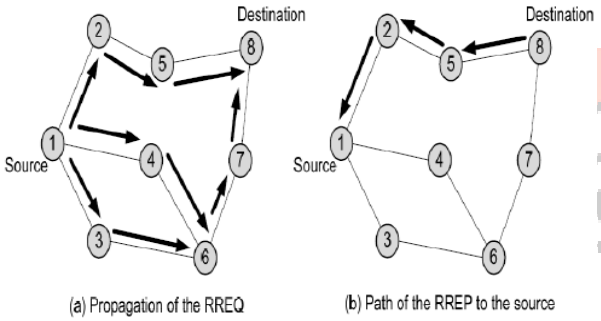
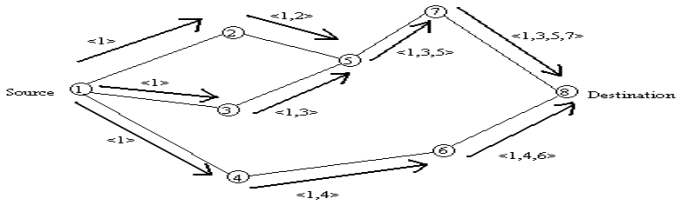


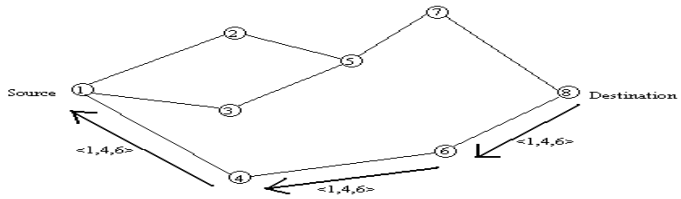
Figure 5: AODV Protocol

2.2.2 Dynamic Source Routing Protocol (DSR)

Dynamic Route Protocol from Source (DSR) is a simple, well-designed routing protocol for the use of multimedia wireless phones that feature circumvention. The DSR allows this network to be self-managed and configured without the need for fully existing or fully integrated network infrastructure requirements. This protocol has two main mechanisms - the "Path of Detection" and "Technical Service Path" - which work together to open and save the nodes in an arbitrary direction in the network of friends.[5]



(a) Building Record Route during Route Discovery



(b) Propogation of Route Reply with the Route Record

Figure5: DSDV

2.2.3 Temporally-Ordered Routing Algorithm (TORA Protocol)

The main features of the TORA are the core of communication management in a small set closer to the node in the region, in which changes were made to the topology. To achieve this property, the node maintains a node in a neighbouring interval. This protocol has three tasks: the establishment of roads, repair and cleaning roads. Roadmap is implemented QRY and UPD. Creating an official algorithm is commensurate with the beginning of the set of zeroes of the target node and to the empty set height for the height of the other nodes. [11]

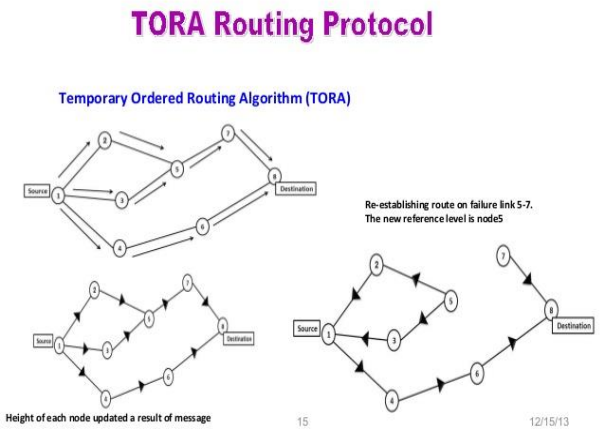


Figure6: TORA Protocol

2.2.4 Cluster based Routing Protocols (CBRP)

In these protocols, clusters are made up of whole network divisions in their own control groups of nodes. These groups are redesigned if there is a dynamic network switchover change. For creating these clusters, the following are used algorithms. If a node is part of a network, it is included in an indeterminate state. In this state, it regulates and distributes timer greetings to all other nodes. If the cluster manager that received this message is Hello, Hello, it has responded immediately. When an unknown node receives the message, it switches its state members. If the node does not receive a response after the specified time, he mentions himself as the cluster header in the event that it has two way relationships with its node, node, or node. Otherwise, it is still in a state and repeatedly indeterminate procedures [6].

3. Ad-hoc Network Characteristics

3.1 Movability: The node can be moved very quickly. We may have random individuals mobility, mobility, mobility patterns, which may have an important impact on the choice of route guidance and thus may affect the performance.[12]

3.2 Multi-hopping: Multi-hop networks are networks where the path from source to this goal goes through multiple nodes. Ad-hoc Networks often find hops a lot of constraint to negotiate, conserve spectrum and conservation energy.

3.3 Energy storage: Best accessories have limited diets and a lack of ability to produce their own power (e.g., solar panels). Energy Efficiency Design Protocol (e.g., MAC, guidance, resource discovery, etc.) is important for the longevity of the mission.

3.4 Protection: In the ad-hoc network, the vulnerability is better vulnerable to attack than the physical structure. In active attack attacks try to impediment the operation (checking and packet datum, packing, packet restraint, dumping, dumping, dumping, except for repairs, etc.). Passive attacks are unique in peer to peers network, and can be more dangerous than active attacks. Finally find the active attacker and the defective. Passive attacks never found on the web. It keeps track of data and controls the sampling movements and thus shows simple transactions. The protection against passive attracts require a new encryption method integrated with the powerful network protocol security algorithm.[13] [14]

4. Usage for Ad-hoc Network

4.1 Military applications: The AD-HOC wireless network is useful for communication between the soldiers who is on the battlefield.

4.2 Collaborate and distribute: Conference computers can share data on Ad-hoc networks. Stream multimedia objects between participating nodes.

4.3 Emergency Operations: Wireless networks are functionally in disaster-prone operations such as operational search and rescue and mafia.

4.4 wireless cable networks: Networks are built on wireless communications and allow for wireless connection and restructuring around blocking paths from the node up to the node until the connection is established.

4.5 Sensor Wireless Networks: Wireless Sensor Networks is a special network of Ad-hoc networks that are used to provide wireless communications infrastructures between sensors within a special program area. The wireless sensor network is a collection of large sensors that are arranged in a specific area.

4.6 Hybrid wireless network: One of the core areas of wireless connectivity is in hybrid wireless architecture such as Cellular Networks (MCN) and Integrated Networks (ICAR). Mobile Multi-Module Network (MCNs) allow communication via a base station or a mobile node. Integrated Adaptive Network (ICAR) is a system that combines simple cell technology with the Joint Ad Hoc Relay (ARS) Terminal Technology. In cellular delivery systems, cells will contact or transmit outgoing calls from out-of-cell cells that are not filled. [15]

5. Problems in Several Routing Protocols

5.1 Problem in architecture of MAC protocol: Because the wireless system is completely different from the cable environment and the wireless network that is dealt with special issues that are not applicable to cable networks. Protocols are required to control shared media access on these networks. Different problems with the MAC protocol for the wireless network are listed below: [6] [15]

5.1.1 Performance Frequency: Bandwidth capacity can be usage for real data transfer to the total bandwidth available. The nodes in the AD-HOC share common radio channels, the range limits the amount of communication waves that are also limited. Therefore, the design of the MAC protocol should be done by the way the bandwidth is used effectively.

5.1.2 Quality of Service (QoS): Quality of service support is required to support key traffic clips, which are time-based traffic in military communications. The MAC protocol for wireless networks that are used for real purpose should have some resource backup mechanisms that take into account the nature of the wireless channel and the mobility of the node.

5.1.3 Synchronization: Synchronization is very important for keeping the speed from the nodes. The MAC protocol must be taken into account in the synchronization between nodes in the network.

5.1.4 Hidden and exposed problems: Hidden and unlocked issues are unique for wireless networks. Problems with hidden stations refer to the clash of packages at the node obtained by the forwarding of those nodes that are not within the scope of direct transmission of the sender, but within the recipient's receiving range

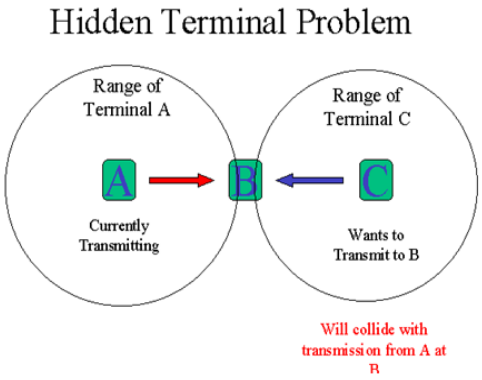


Figure7: The hidden terminal problem

The diagram shows the scenario: sending to B, C can not get A, C wants to send to B, C feels "free environment" (CS failure) hit B, A can not get hidden clash for c. The terminal problem described refers to the inability of the node (blocked by the transmission from the nearby transmitter) to switch to the node.[Ref-14]

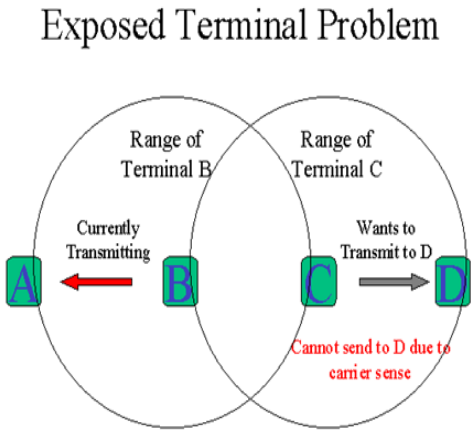


Figure8: Exposed Terminal

5.2 Problems in Ad-hoc Network

5.2.1 Mobility: Cable transmission protocols can't be used in wireless networks where node mobility leads to frequent network topologies changes.

5.2.2 Bandwidth settings: Limited bandwidth also has limitations on routing protocols while maintaining topological information. Since the wireless routing protocol requires full topological information, they can't be appropriate for network.

5.2.3 Public Restrictions: Resource constraints, which are the main limit a transfer wireless network nodes, are battery life and processing power because they have a lot of resources and resources. [15]

6. CONCLUSION

In this article, we provide a description of the different types of routing protocols for wireless networks. We also provide an overview of these network protocols based on customized flow chart. Ultimately, this article demonstrates the possible applications for real-time wireless networking and wireless networking challenges. It is not clear which specific protocols are best for each scenario, each protocol has its advantages and disadvantages, and is suitable for special situations. This wireless network is growing rapidly and exchanges, and while there are still many challenges that need to be met, it is likely that these networks will be deployed globally over the next few years.

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