MOBILE AD-HOC NETWORK AND TYPES

[1]SABARIESWARI K , [2]LALITHA R ,[1]NAFIRA BEGUM H

[1] DEPARTMENT OF COMPUTER TECHNOLOGY,SRI KRISHNA ARTS AND

SCIENCE COLLAGE COIMBATORE ,TAMILNADU-641008

[2] ASSISTANT PROFESSOR, SRI KRISHNA ARTS AND SCIENCE COLLEGE

COIMBATORE ,TAMIL NADU-641008

ABSTRACT:

To connect gadgets anytime anywhere without wire is the major development of Ad-hoc Networks. Mobile ad-hoc networks are use only moveable objects like mobile phone ,laptops and PDA for continuous connection to achieve the communication. This paper implies about the routing protocol in mobile Adhoc network and their types. The mobile adhoc network is an infrastructure less network it forms only according to the program. Since MANET (Mobile Ad-hoc Networks) is wireless network leeds to some security problem in the network that is very complicated to solve. This MANET has some singular features like low battery power usage ,dynamic network topology and restricted bandwidth. In thid paper we discussed about the three major types of MANET which is most commonly used in our day to day life that is vehicular Ad-hoc networks, smartphone Ad-hoc Networks and internet based ad-hoc networks. This paper is about the three types of Adhoc network's working principle are explained. Adhoc is the highly performing network comparing to other wireless network .

Keywords : MANET, Vehicular Ad-hoc networks, smartphone Ad-hoc Networks, Internet based ad-hoc networks.

I. INTRODUCTION:

An Ad-hoc networks will have the self configuring, infrastructure - less network of mobile devices and it is wireless connection . And this wireless network can be free to move anywhere anytime. A wireless network concept is found 100 years ago. The wireless LAN communication is done in Two ways:

1.1 Infrastructure mode

It is logical mode, structured one node depend on other node. In this mode if one node in the network is damaged no service will be provided by the network Ad-hoc Network

1.2 Infrastructure less mode

It works concede to the situation. No structure is used in this mode. It is flexibility and dynamic network.

The earliest wireless data network is called “packet radio” network and was sponsored by DARPA (Defense Advanced Research Projects Agency) in the early 1970’s. These early experiments took place in the amateur radio community with the x25 protocol. It will help to increase the motivation of the original Internet protocol suite.

Ad-hoc uses the unlicensed frequency spectrum and there is no single point of failure in Ad-hoc network. The lot of challenges affected the Mobile Ad-hoc network’s span from different layers of the OSI protocol stack. The Media Access Layer (MAC) has to be improved to resolve the various collision and hidden terminal problems in the network. The session layer protocol has to deal with the discovery of servers and services.

Most of the network functions may not have the high degree of adaptation in the Ad-hoc network. In Ad-hoc network all the operations are completely distributed manner.

This Ad-hoc network is instantly formed when the service is requested from the user and the specific service is done by the network it will automatically destroy the structure that has been made. This Ad-hoc will not depend on any Base station or a Access point. But this network node depends on other node to keep the network connected till the specific purpose of the network ends. Each node is free to move and it can change its link to other network node frequently. Every node in Mobile Ad-hoc network is treated as Router. Routing in Mobile Ad-hoc network is falls in 3 categories, namely

i. Proactive routing

ii. Reacting routing

iii. Hybrid routing.

This Mobile Ad-hoc network (MANET) is also known as “on the fly” network because the network of mobile phones connected without wires. And it also called as “Spontaneous network”.

This paper is about the most important types of Ad-hoc network that are commonly and highly used in the mobile technology world namely

i. Vehicular ad-hoc network

ii. Smart phone ad-hoc network

iii. Internet based mobile ad-hoc network

So these three topics are explained in this paper

II. VEHICULAR AD-HOC NETWORK:

Vehicular Ad-hoc network (VANET) is consist of Vehicular to Vehicular and Vehicular to Infrastructure intercommunication is based on wireless local area Network (LAN). This VANET will ensure the safety environment to the passengers and comfort their Transport. For this safety and useful the regional government and the national government has to allocate the wireless spectrum for wireless communication among the vehicles and to form the road side unit(RSU). The major goal of VANET is to give the Road security for the people and Transportation adaptability in the road. There are three major goals in the VANET that are

- ✧ Lowering the number of accidents
- ✧ Lowering the number of Traffic jams &
- ✧ Lowering the level in Environmental impact

VANET is highly Dynamic network. The applications of Vehicular Ad-hoc networks are

- ✧ Cooperative forward collision warning
- ✧ Traffic light optical speed advisory
- ✧ Remote wireless diagnosis

There are eight different applications are worn in the Vehicular Ad-hoc network the first four of these applications will be appeal us for the vehicle to vehicle communication, where as the other four will needs the road side Infrastructure .

Every vehicle can able to send and receive packets directly from one another this is considered as one hop neighbor.

2.1 Technical challenges:

In VANET there is no transmission between the coordination is assumed. Here the VANET didn’t have the centralized communication because of this several applications in VANET will be demanded to function dependable using the decentralization or the handshaking of protocol will be assumed. When there is a use of many applications in many surrounding cars a single shared control channel can be expedition in network. But in case of multiple channel is serviceable in one or more transceiver shared control channel is desired. The main focus of applying the IEEE 802.11 is to make path of multiple access (CSMA) depend on Media Access Control for the Vehicular Ad-hoc network .The normal bandwidth of VANET is 10 to 20

MHz this bandwidth contains the high Vehicular Traffic density. But if we use more channel may cause to multichannel synchronization problems in VANET.

In VANET the big challenge is correspondence between the security and the privacy necessity. At the same time the receiver has to ensure about the root of information and this trust from sender may contradict.

The essential topology for the VANET is Microscopic model. Many people create the several topology for the VANET, where Wiedemann model is considered as the high fidelity model and the Nagel-Schrechenberg's model is considered as the Low fidelity model.

2.2 Security and privacy in VANET:

VANET security is primarily involved in life safety. However the vital intelligence are unable to modify or deleted by an unknown force. Unique characteristic of VANET such as dynamic topology, short connected duration, high mobility can bring security issue in the VANET.

There must be two rules are met together for a healthy conversation between two different networks namely,

a. The sender must determine that information as a proved source

b. The content of a senders information is not mitigate

III. SMART PHONE AD-HOC NETWORK:

The smart phone Ad-hoc network is shortly called as SPAN's, it comes out from the approach based on Architecture and topology trailing wireless ad-hoc network. Smart phone was installed with Ad-hoc network technology at initial stage. It can construct ad-hoc network over other gadget. Smart phone ad-hoc network does not depend on cellular carries network, wireless connection point or traditional network infra structure.

The ad-hoc network takes the greatest advantage of previously available hardware in applicable smart phone to create peer to peer network.

The mechanism what we use is rear Wi-Fi ad-hoc mode,which permits the communication straight over visible neighbor and routs exploration Structure.

For Example:

Wi-Fi directed which is completely different from traditional hub and spoke network. They support multi -hop routing. Peer will tie and allowance without spoiling the network.

3.1 Main features:

An SPAN is independent of carries network, wireless approach points, or Traditional network infrastructure and capable of accessing peer to peer communication.

The excellent stationary infrastructure are router netting extenders ,non phone hardware .

The routing rules in SPAN may be originated at Network layer or link Layer

People use this for a maximum advantage carry on the person for every day in day to day life.

Threads to telcos in SPAN are the Ad-hoc networking technology performing on Wi-Fi ad-hoc node, at the unlicensed bandwidth provided by ISM of 2.5 GHz may results in profit or loss by cellular carries since ISM band is complimentary and unlicensed although cellular carries is licensed.

The SPAN can perform independently and allows communication between users externally. The head of 3rd Generation or 4th Generation LTE signals.

Important applications of SPAN is Implemented where the nation doesn't consist of network infrastructure.

Natural disaster or terrorist incidents in existing network infrastructure is overloading

Million of teens are to useful of their Ad-hoc networking for communication purpose externally without the Wi-Fi signals.

iPhone can now talk to each other without using a cellular signal or connection.

Android phone Ad-hoc networks by merging Linux wireless extension API with Android Kernel source and recompiling.

IV. INTERNET BASED AD-HOC NETWORK:

Internet based ad-hoc network is based on emerging technologies, and self organization mobile network. The important purpose of creating the internet based Ad-hoc network is uses for future commercial and military based application.

The Internet Engineering Task Force (IETF) standard attempt build for make a connectivity over Internet based Ad-hoc network.

Internet routing protocols is fully based on IP address. IP address is a combination of network ID and host ID portion. All the Routing decisions are made by the Routers on packet based transaction on the network ID portion of the destination IP address.

IP address of a carbon network will share the common ID of the network. The uppermost Internet hierarchy is Autonomous System. Every Autonomous is a System specific routing Domain.

This autonomous is guidance the router to contact inside Intro domain routing protocol. This is also called Interior gateway protocol. The Routing Information Protocol (RIP) and Open Shortest Path First (OSPF). The gateway Router is used to associate contrasting autonomous system. Exchange routing information is between the different Autonomous systems is done by Exterior Gateway protocol.

Address authentication in internet based Ad-hoc network is if a mobile node base station is chosen a gateway means all the packets sent over this gateway to the internet demand an origin address with the carbon prefix as a gateway. Ad-hoc node expects the address permitted to abstain other solutions like Network address Transaction (NAF).

For this case Ipv6 defines two central principles for auto-configuration

- ✧ State full
- ✧ Stateless

The connection middle from the different Autonomous system is made by the Border Gateway Protocol (BGP) and also affords allocation of requested information by one autonomous system with another autonomous system. It change the routing when it urgency of requirement.

The several internet gateway approaches is made for the approach to global services. An IG (internet gateway) in the Access network can add internet affinity for all the nodes in MANET.

The functionality of detecting internet gateway cannot be provided by the standard ad-hoc routing protocol. The discovery of gateway can be realized in three contrasting ideas:

- ❖ Reacting discovery approaches
- ❖ Proactivity discovery approaches
- ❖ Hybrid way discovery approaches

There is a different relatedness for a MANET. An ad-hoc network is linked to a IP network mobile node. The ad-hoc network will work only if it gets the global address to communicate with internet and nodes.

For the purpose of wireless internet connection, there are two paths are defined in internet based ad-hoc network. Namely:

1. FIXED INTERNET GATEWAY

2. MOBILE INTERNET GATEWAY

V. CONCLUSION:

The paper analysis about the mobile ad-hoc network and there most common types in the briefly manner. We pointed out about the technology, concept and uses of a Mobile ad-hoc network and there three types. In this paper our survey about the wireless multi-hop of networks. Still there are several topics and challenges are ahead. The beneficial of mobile ad-hoc network, vehicular ad-hoc network, smart phone ad-hoc network, and the internet based ad-hoc are efficiently shown in this survey.

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