MANET Concept, Characteristics and Applications in Communication

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Abstract-"Communication is one of the integral parts of science that has always been a focus point for exchanging information among parties at locations physically apart. After its discovery, telephones have replaced the telegrams and letters. Similarly, the term `mobile' has completely revolutionized the communication by opening up innovative applications that are limited to one's imagination. Today, mobile communication has become the backbone of the society. All the mobile system technologies have improved the way of living. It's main plus point is that it has privileged a common mass of society. In this paper, the evolution as well as the fundamental concept, characteristics and applications of the mobile ad hoc network is discussed".

Introduction:-

"We are very much used to use the mobile phones in our daily life. We are not stable at some place. We always keep moving here and there. Ad Hoc network is used to carry out effective communication".

What is Ad Hoc Network?

"An Ad Hoc network is the network connection that is build up for single session of communication between two entities. The Ad Hoc network does not use a router or a wireless base station.
When you want to transfer a file from your mobile to your friend's laptop, you use Bluetooth. In this communication session, Bluetooth acts as an Ad Hoc. It needs no router or a wireless base station".

What is MANET?

"MANET stands for Mobile Ad Hoc Network. The Ad Hoc network that is used for mobile communication is called MANET.
When the user is mobile, the session may not hold good and the communication may get hand-off. The MANETS come into picture when the user is moving.

The MANETS use wireless networks to connect with different networks. Some of the MANETS are connected to LANs and some are connected to the internet based on the application of the network. These networks configure themselves even though they are not connected to any wireless routers".

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Characteristics of MANET:

Dynamic Topologies:

"The nodes of the network keep on moving with different speeds, which results in the variations in the structure of the network.

The devices in the modern electronic world completely rely on batteries. The design of the network is to be optimized to conserve the energy consumed by the mobiles".

Limited Bandwidth:

"The bandwidth of the wireless network is very much limited and the networks are to be optimized to perform with the maximum efficiency with in the limited bandwidth".

Security threats:

"When compared to the wired means of communication, wireless means of communication is more affected for security. The security of the MANET is to be optimized so that the information transferred is secured".

Energy constrained operation:

"Some or all the node of mobile ad hoc network may rely on batteries or other exhaustible for their energy. For these nodes the most important design optimization criteria may be energy conservation".

Applications of MANET:

Introduction

"In the occasion where there is a group effort required the MANET plays a major role in wireless communication and provides effective communication.

At the time of disaster it is easy to develop a wireless network rather than a wired network. The places where wired network may be affected by the disasters MANET can be implemented.

As far as the Personal Area Networks (PAN) are concerned they need not much coverage. They just need the coverage of very limited area. MANETs server the purpose in such situations".

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Applications

"There are many applications to the mobile ad-hoc Networks. As the matter of the fact any day-to-day application such as e-mail, file transfer can be considered to be without difficulty deployable within an ad hoc network surroundings. There are many web services are also possible in case any node in the network can serve as a gateway to outside the world.

In this discussion we need not emphasize wide range of military applications possible with the mobile ad hoc network. Not to mention the technology was initially develop keeping in the mind the military applications such as battlefield in an unknown region where an infrastructure network is almost impossible to have maintain. In such condition ad hoc network having the capacity can be effectively used where other technology either fail or cannot be deployed effectively. Advance features of wireless mobile systems including data rates compatible with multimedia applications global roaming capability and coordination with other network structures are enabling new applications. Some well-known ad hoc network applications are":

Collaborative work

"For some business environments the need for collaborative computing might be more important outside office environment than inside. After all it is often the case where people will do need to have outside meetings to cooperate and exchange information on a given project".

Crisis-management applications

"These arise, for example as a result of natural disasters where the entire communications infrastructure is in disarray. Restoring communication quickly is essential. By using ad hoc networks we can setup the any infrastructure easily required for the wire-line communication".

Personal Area Networking and Bluetooth

"A personal area network (PAN) is a short range localized network where nodes are usually associated with a given user. These nodes could be attached to someone's pulse watch belt and so on. In these scenarios mobility is only a major consideration when interaction among several PANs is necessary illustrating the case where for instance people meet in real life. Bluetooth [1] is a technology aimed at among other things supporting PANs by eliminating the need of wires between devices such as printers PDAs notebook computers digital cameras and so on[2]"

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CONCLUSION:-

"The aim of this paper is to understand the challenges and application of MANET so as to boost the research work in this field. During the study we understand that Mobile Ad-hoc Networks (MANETs) are expected to be very useful and important infrastructure for achieving future ubiquitous society. Designing MANET protocols and applications is a very complicated task since it is hardly possible to build large-scale and realistic test beds in real world for performance evaluation. The listed challenges and applications in our paper will give a new way for researchers to make development in this area"

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