MOBILE AD-HOC NETWORKS AND ITS APPLICATION IN CURRENT SCENARIO

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Abstract-In past few years, traditional wired network have become quite outdated. Use of wireless technique has provided a wide scope for development of technology. MANET is one of these advancements. MANET is an unrestricted, infrastructure less and independent collection of mobile nodes, that can serve either as router or node. Due to these properties, MANET has lot of applications in the real life. This paper focuses on MANET applications in real life. This can help researchers to understand various fields where MANET can be applied.

1. INTRODUCTION

MANET (mobile adhoc network) is a clustered set of nodes in which nodes acts as mobile routers as well as participating nodes. In MANET, IoT devices are connected through wireless links to the node though access point can be either wired or mobile. There is no earlier specified configuration and structure of the MANET therefore it is possible for nodes to change their roles as per requirement means in this autonomous system at times it is possible that the node earlier task acting as mobile router can simply act as participating node in some other task. Due to this changing topological structure, MANET will emerge as an indispensible technique due to possibility of its implementation in wide variety of fields [Hoebeke, 2004] [Raja, 2014] [Raza, 2016].

2. APPLICATIONS

Despite having many issues and challenges, MANETS can be vastly implemented in various fields. Many scientists are working hard for overcoming

these issues to make it a quite popular and useful mobile networking technique. There are many fields where it is considered that MANET can be successfully implemented and the world can be taken to a totally new era of technology [Neeraj, 2011] [Raja, 2014] [Raza, 2016]. Categorization of MANET is provided below.

2.1. *Commercial And Business Applications*

Use of MANET for commercial and business applications can act as a boon for the economic sector. MANETs can be used for making e-payments anytime and anywhere. It can facilitate e-trading at trade fairs, which can be quite time saving. Apart from this MANETS can be used for making supporting systems for sports stadium, route guidance systems, visitors supporting systems for the airport [Yudhvir, 2012]. MANETS can also be used for fast accident handling, creating a dynamic database, inter-vehicle route guidance system as well as for forecasting weather report for the remote areas.
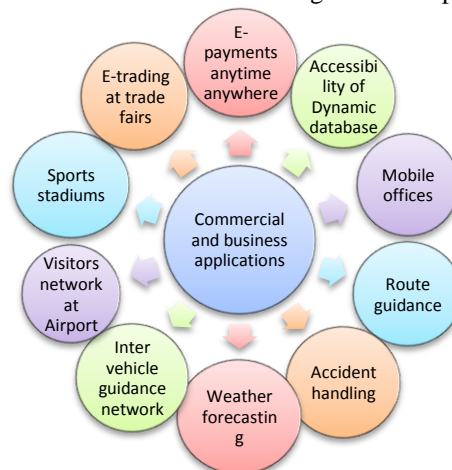

Figure 1: Commercial and business applications

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2.2. Civilian And Household Networking

MANETS with limited range like PAN and Bluetooth are very much useful for information sharing with in a home or an office. It is quite easy to arrange e-conferences and e-meeting rooms using MANET.
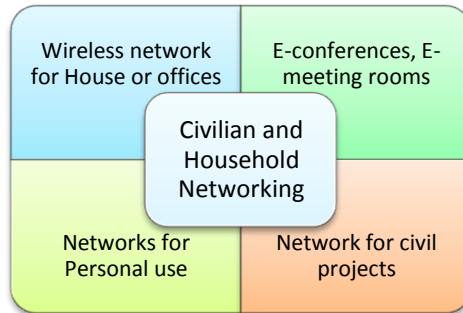

Figure 2: Civilian and household networking applications

It can may the data exchange among the portable devices like cell phone, Camera, Printer, TV-juke-box, Tablet PC and Laptops. It is possible to guide civil projects at remote locations with the help of this network.

2.3. Militray Applications

Information exchange in the military or the army is quite confidential, so it is done only after encrypting the data. MANET can be very much useful for military surveillance and operations. Planning of every strike done by military forces is planned long before the action. MANET can be quite helpful in this preplanning and data exchange. At the time of war, the armed vehicle can be guided a safe route to the battle field using MANET. It is very much useful for commanding in automated battle fields [Yogesh, 2010] [Parveen, 2012] [Renu, 2012] [Vikash, 2012].
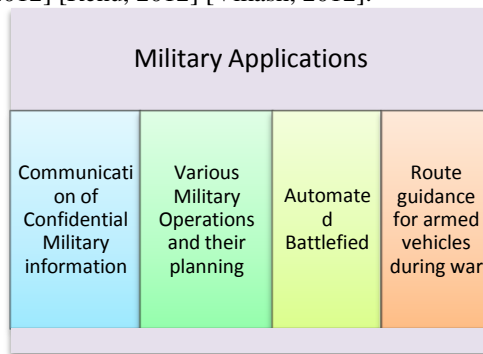

Figure 3: Military Applications

2.4. Network For Emergency Services

MANET can prove to be quite useful for providing network in a sudden unforeseen crisis. MANET is quite helpful in search and rescue operation of the missing people in inaccessible locations. At times, when due to some natural disasters whole network system gets destroyed then for re-establishing the network in the area MANET proves to be a very useful tool. In case of disaster, many supporting systems like policy making, fire fighting system, e-guidance facility for the first aid of injured people in inaccessible location, medical aid and support system, support system for doctors and nurses for diagnosis problem and record maintaining system can be formed using MANET in a quick way [Parveen, 2012] [Renu, 2012] [Vikash, 2012].
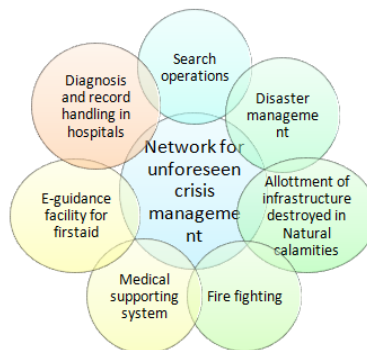

Figure 4: Network for unforeseen crisis management

2.5. Education System

MANET can be helpful in making our education system advanced, updated as well as quite interesting for the learners. Online admission system, virtual classrooms, e-learning can easily provide education to those students for whom it is not possible to go to the school or university due to any reason, so that no one remain deprived of education. Not only this, online meetings, online lectures, e-student supporting cell can be arranged to share information and help them clearing their doubts [Preeti, 2008] [Pooja, 2013].
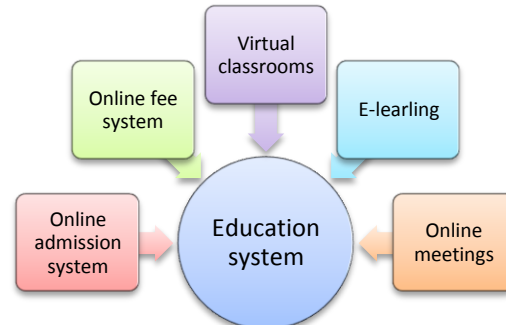
Figure 5: Application in education system

2.6. Entertainment

Entertainment delights every age group and every person everywhere in the world. MANET provides a wide range of entertaining techniques for everyone like multiuser games for game lovers, theme parks for theme based fun admirers, robotic helpers and pets for techno-crazy people, outdoor internet access and wireless P2P networking [Parveen, 2012] [Renu, 2012] [Vikash, 2012].
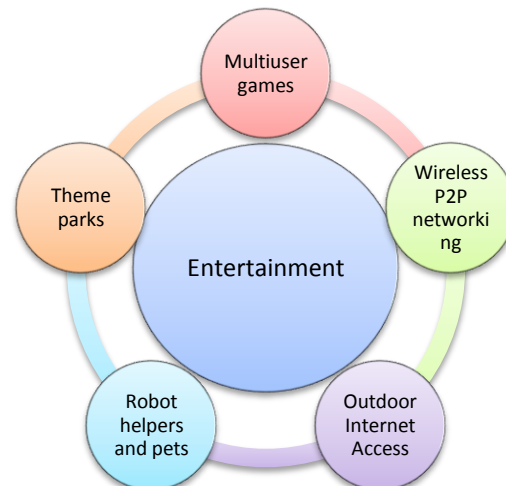
Figure 6: Application in the field of entertainment

2.7. Sensor Network

Electronic devices that we use in out day to day life have smart sensors and actuators integrated in it, which ease our household work up to a great extent. MANET can take this senor system to the next level of development. MANET is also helpful in health care services. For this, sensors are attached to our various body parts, which generate signals, on the basis of these signals health issues of the person is diagnosed and treated. This technique is known as Body Sensory Network(BSN) technique, which is a fast emerging technique. Mobihealth and Code Blue are examples of BSN, which are currently in trial stages. Apart from this MANET can also be used for tracking animals and preventing them from any danger. MANET is also helpful in detecting and preventing any leakage or theft of biochemical hazards. Even the infinitesimal change can be easily identified using this technique, so it is quite helpful in labs as well.
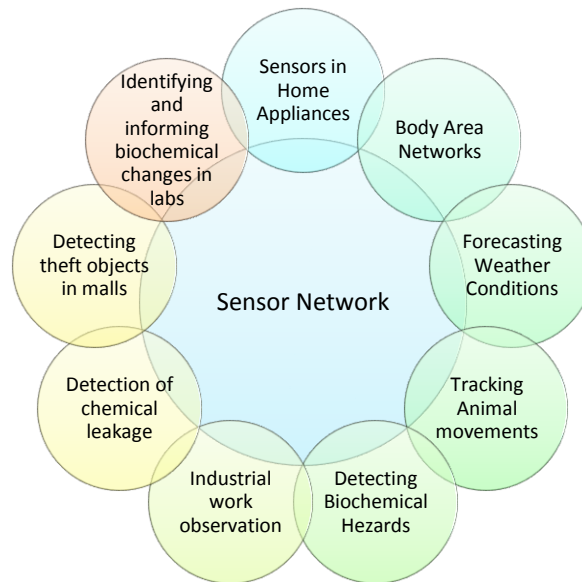
Figure 7: Sensor Network

2.8. Application For Spreading Awareness

MANET is also quite helpful in spreading awareness among people. Some examples of this are guiding tourist at the unfamiliar place to ease them in their journey and providing locations specific information. Time bounded services, time dependent services, follow on services like call forwarding, call waiting, mobile work space services quite good applications of MANET [Yogesh, 2008] [Yudhvir, 2010] [Rahul, 2012].
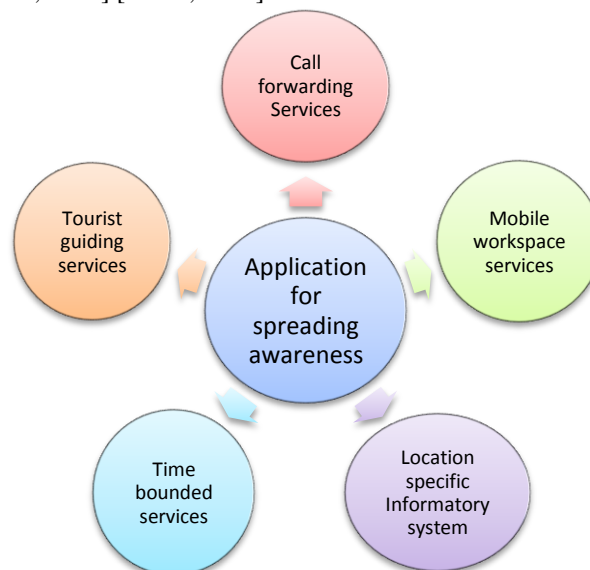

Figure 8: Application for spreading awareness

2.9. Coverage Extension

Access of the cellular network can be extended using this technique at the remote locations. One can easily connect up with a internet, intranet, extranet etc. easily using MANET. Radio packet service is another example of extending the network covered area using MANET [Hoebeke, 2004] [Prabha, 2011] [Raja, 2014] [Raza, 2016].
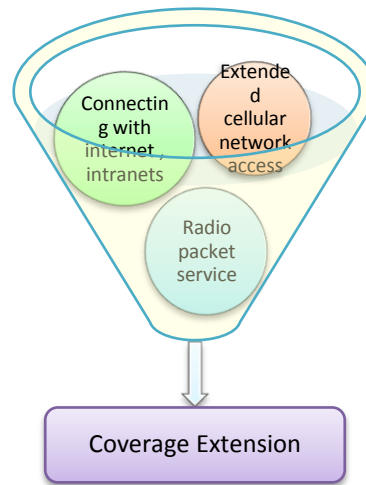
Figure 9: Application in coverage extension

3. CONCLUSION

MANET is one of the fastest rising networking techniques. Despite having lot of challenges and issues, one cannot overlook its importance and facilities it is capable to provide. MANET is a networking technique which provides most divergent range of applications in almost all the fields. Implementation of many of these applications is in trial phase. If all these applications are successfully implemented, then the future of mankind will be glorified.

4. REFERENCES

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