MOBILE DEVICE-TO-DEVICE AD-HOC COMMUNICATION SYSTEM (MDACS) FOR CROWDED EVENTS: A MANET COMMERCIAL APPLICATION

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ABSTRACT

Mobile adhoc wireless network play a key role in situations where there is no internet access or basestation is not available including disasters or army operations or in wireless sensor networks with low power. For example, army units for example tanks, soldiers etc can form a channel to communicate with each other irrespective of geographical location. Adhoc mobile wireless network play a major role in case of rescue operations and in critical situations which needs to be addressed immediately. Other advantages of adhoc network include sensor networks or virtual classrooms. The whole life-cycle of adhoc network is divided into three phases and Present ad-hoc network systems are considered to be the most efficient wireless network. These attributes enable the proposed system to deliver significant benefits in situations in which network with or without the base station whether responding or not. Here we are presenting a commercial utility application of mobile ad hoc network named MDACS which is proposed to be best implemented at the crowded events.

Keywords: Mobile Adhoc Network, Wireless Communication, Infrastructureless Networking, Infrastructureless Communication, Internet Protocol

INTRODUCTION

A mobile adhoc wireless network is a type of ad hoc network which consists of multihop topology which leads to location change. Since mobile adhoc wireless network consists of mobile devices therefore there is no need of any basestation for communication to take place. Communication can take place wirelessly with the help of satellite or wifi network. Duggirala R., Gupta R., Zeng Q. A. et al. have worked on Performance Enhancements of Ad Hoc Networks with Localized Route Repair. (Duggirala R., 2003).

A mobile adhoc wireless network is a network of mobile devices without any basestation connected wirelessly. It does not require a centralized infrastructure to establish communication. Each and every device in mobile adhoc wireless network is independent and hence can move in any direction changing its link from one device to another due to multihop topology. Nasipuri, Castaneda et al have stated about the Performance of Multipath Routing for On-Demand Protocols in Mobile Ad Hoc Networks. (Nasipuri, 2001).

COMMERCIAL APPLICATIONS OF MANET

Mobile adhoc wireless network include applications which leads to communication to take place between mobile devices.D. Helen and D. Arivazhagan have worked on Applications, Advantages and Challenges of adhoc network in Journal of academia and industrial research, ISSN: 2278-5213. (D. Helen and D. Arivazhagan, 2014)

- There is a need of future military networking for IP-compliant data services within mobile wireless communication which are also robust in nature.
- It is an adaptable method for establishing communications for fire/safety/rescue operations and other scenarios requiring quick-deployable communications that can survive, efficient dynamic networking.

CONCERNED ISSUES

Event 1

In the vast world of today the problem of frequency breathing has come to light these days. According to the Indian Trade Promotion Organization report, the visitors are expected to grow by 5.4% per year, reaching 3.9 million visitors by 2017. This means fairs must expand, but also find for better ways of communication between the people working inside the fair for better management. In order to reduce frequency breathing problem (noise pollution), many trade fair in highly populated areas have to make compromises in terms of handling the trade fair efficiently. (ITPO, 39th Annual Report, 2016)

Event 2

Kumbh Mela is one of the largest human congregations on the Earth. In a placed filled with so many people it is difficult for people to even talk(increase in Frequency Breathing Problem) and gets more and more difficult for the management to control in case of any mishappening. In places like these MANET could be a huge advantage both people and as well as the management.

MDACS UTILITY

The proposed Mobile Device-to-Device ad-hoc communication system (DACS) solves the above-mentioned problems ensuring of no need for any fixed infrastructure or base station for communication to take place. In this system one device act as a host and all the remaining devices are client to that host. All the devices which are acting as clients to the host device should be present in the same network as that of the host device for communication to take place. Socket programming is used for communication to take place between client and server. Communication can take place in the form of transferring data such as any message or text file or image file between client and server. To start the communication first thing is to run the server machine. After running the server machine we can see all the client devices which are present in the same network as that of server machine and an interface appears in which we have to give the client name to which we have to send data, the text file or the message. After giving all the information click on the send button. If the client is present in the same network then a message get displayed "data is successfully transferred" and a receiving window appears. On clicking on the open button we can see our message or file which get transferred from server machine. In this way successful transmission of data or information take place without any interference.

CONCLUSION

Successful transfer of data in the form of text messages, images, audio clips and pictures etc. was achieved between two or more devices. We can simply concluded by saying thatwireless nature of adhoc network is its key factor in its success. It enables reduced cost of infrastructure , ease of establishment and fault tolerance, as routing is performed individually by nodes either directly or using intermediate nodes.It is very useful in situations where there is no internet access or infrastructure is not available including disasters or military scenarios or in low power wireless sensor networks.
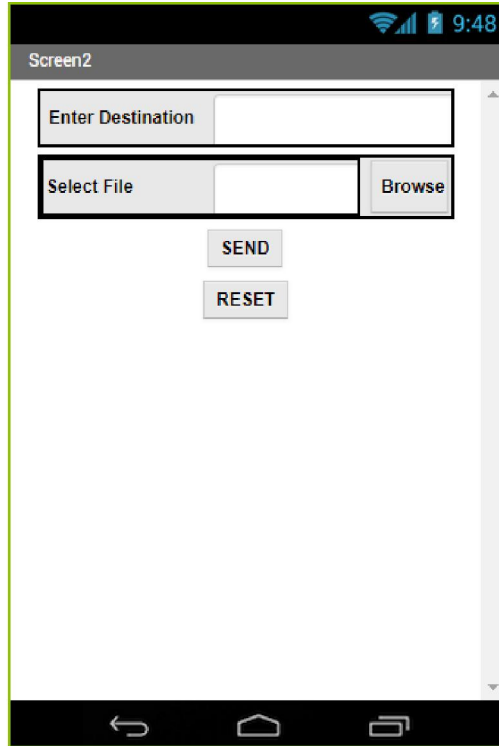
Figure1: An interface to enter client name and the data to be transmitted

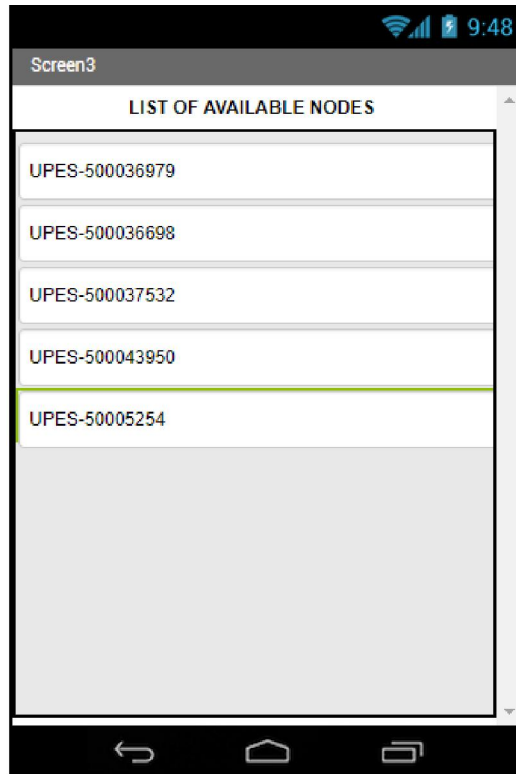**Figure 2**: An interface to write message that has to be transmitted
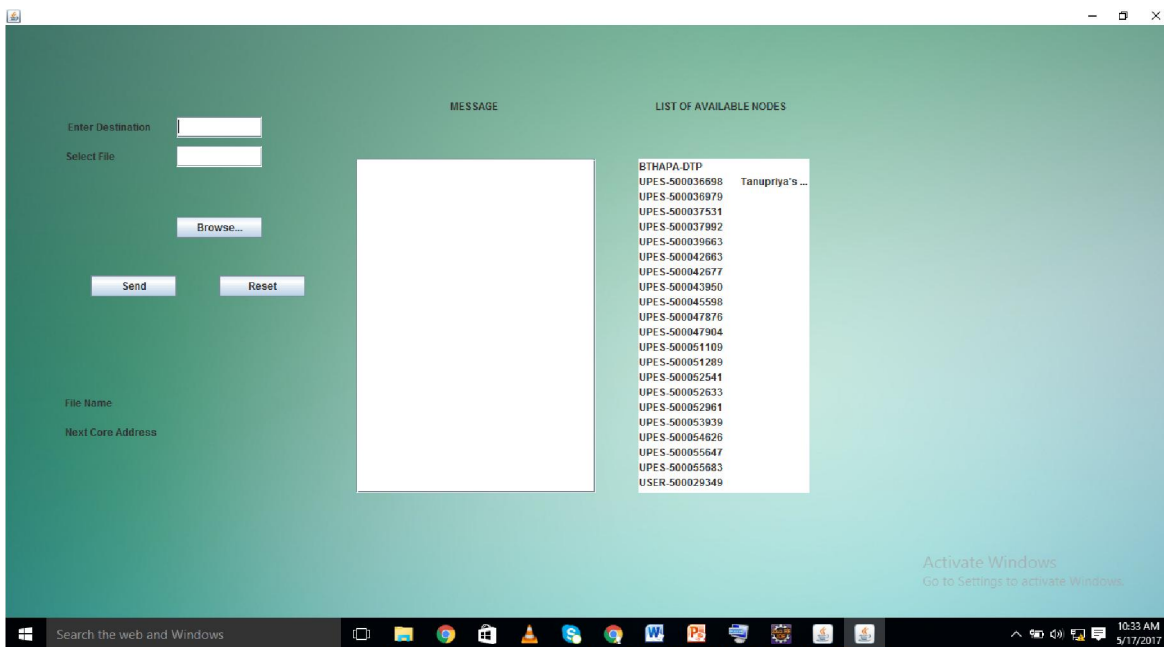
Figure 3: List of client devices in the same network
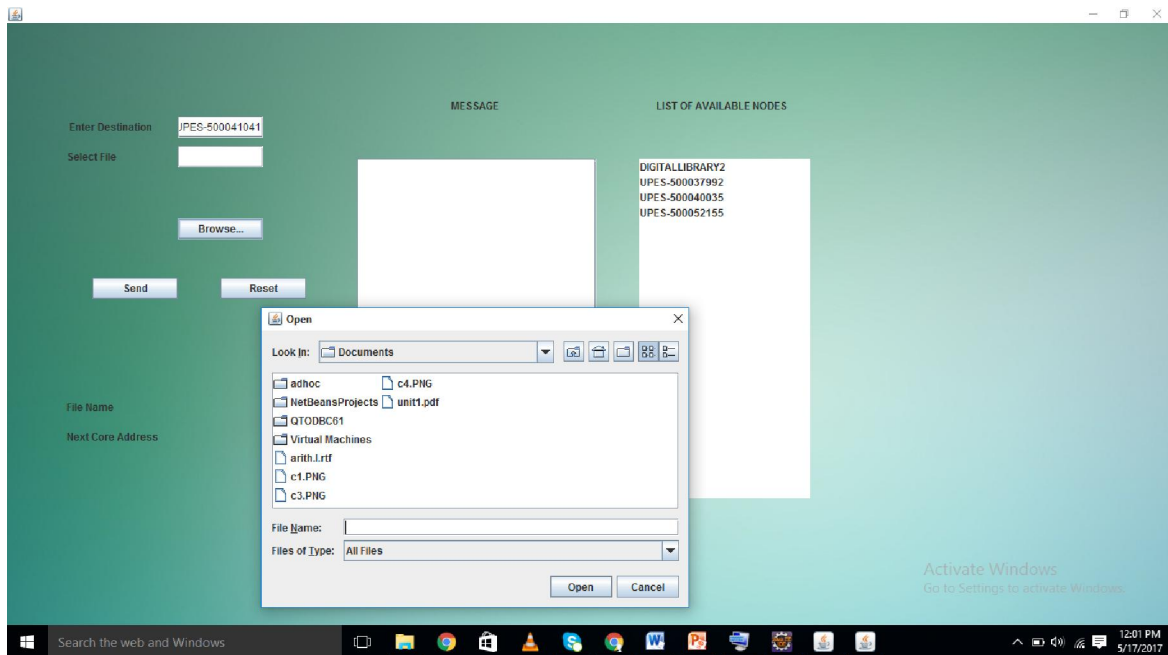

Figure 4: Server side interface

Figure 5: Pop up window opens for browsing files that needs to be sent to the client
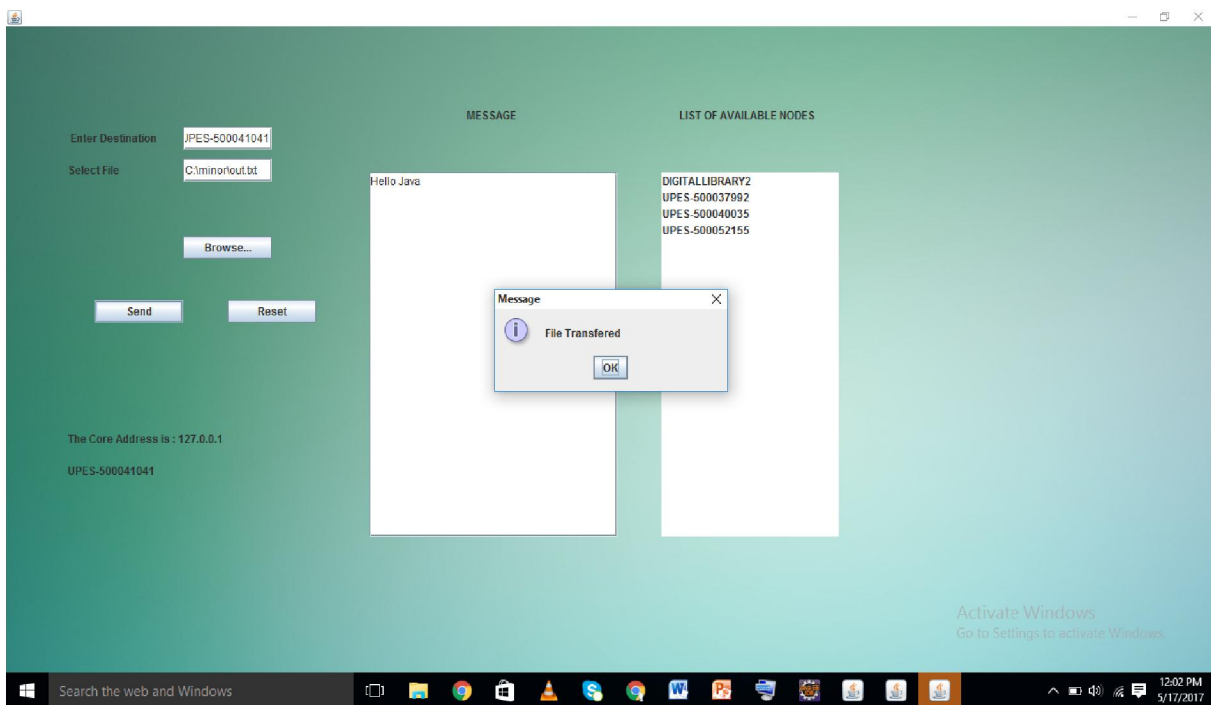

Figure 6: Data is transmitted successfully to the server side

LIMITATIONS AND FUTURE ENHANCEMENTS

- Lack of security is the major limitation
- This infrastructure less network runs slower than structured network
- Signal strength monitoring is not possible
- Improvement in security can be possible by devising new protocols

- Quality of service requirements can be met as desired by devising new protocols and the desired solution could also be used at various places such as railway station, airport and many more

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(A complete list of references is available upon request from Vishal Kaushik at vkaushik@ddn.upes.ac.in)