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Security Issue In Mobile Ad-Hoc Network

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Abstract:-*Ad-hoc networks are a new paradigm of wireless communication for mobile host's need the certification system allocated by the central authorities and this is done by PKI which secures the network. PKI schemes in an efficient way. Mobile ad hoc network (MANET) technology spreads widely in these days. It is suitable for environments that need on fly setup. A lot of challenges come with implementing these networks. The most sensitive challenge that MANET faces is the security issue. Traditional Public Key cryptography (PKC) and Identity based Cryptography (IBE) are slow and not suitable for these environments because of the nodes resources limitations. This paper is going to discuss the security of MANET using the PKI schemes in an efficient way. This solution provides a secure way for MANET nodes to authenticate each other and to secure data sent by each other, But PKI is having the overhead problems as large number of authentication messages transferred between nodes.*

In this research we have presented a new algorithm that will extend the drawbacks of PKI technique and make the network much secure and reliable for small and larger scale networks. Keys and certificates have to be issued to each node (trusted), neglecting malicious nodes on the track and finding the valid route to transfer the data, in other words we have to design the algorithm that store all the path in the server and locations of all the nodes, which changes their location dynamically.

Keywords: *Mobile Ad hoc Networks, Security, Public Key Cryptography, Trusted authority, Central Authority.*

1. INTRODUCTION

Ad-hoc networks are a new paradigm of wireless communication for mobile host's need the certification system allocated by the central authorities and this is done by PKI which secures the network. PKI schemes in an efficient way. It will define new solution for securing MANET networks using a four keys security scheme. This solution provides a secure way for MANET nodes to authenticate each other and to secure data sent by each other. But PKI is having the overhead problems as large number of authentication messages transferred between nodes. Some Techniques like RSA cryptography techniques proved the best cryptography in terms of security of the mantes But RSA Suffers the overhead calculations of larger primes and also this can –not be distributed with Central Authority or Trusted Authority. Thus lacking the certification process. In our research we are presented the new algorithm that will extend the drawbacks of the PKI technique and make the network much secure and reliable for small and larger networks.

Ad-hoc networks are a new paradigm of wireless communication for mobile hosts. There is no fixed infrastructure such as base stations for mobile switching. Nodes within each other's radio range communicate directly via wireless links while those which are far apart rely on other nodes to relay messages. Node mobility causes frequent changes in topology. The wireless nature of communication and lack of any security infrastructure raises several security problems.

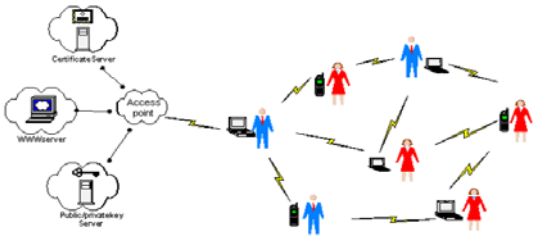

Figure 1: Working of a general Ad-Hoc Network
The following flowchart depicts the working of any general ad-hoc network.

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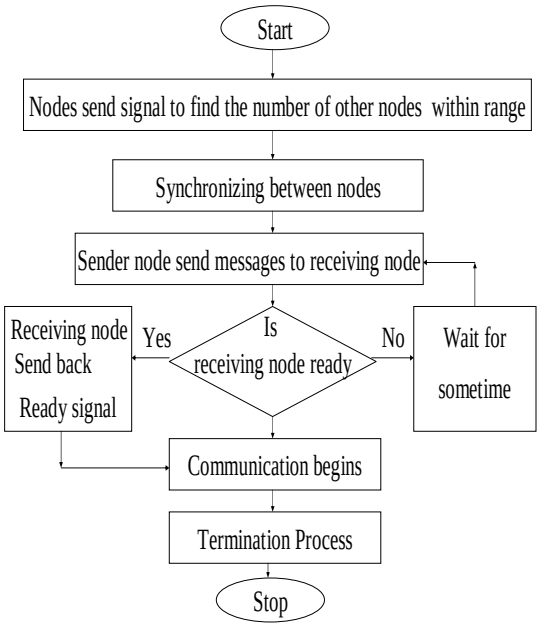

Wireless networks provide rapid access to information and computing, eliminating the barriers of distance, time, and location for many applications ranging from collaborative, distributed mobile computing to disaster recovery (such as fire, flood, earthquake), law enforcement (crowd control, search and rescue) and military communications (command, control, surveillance, and reconnaissance).

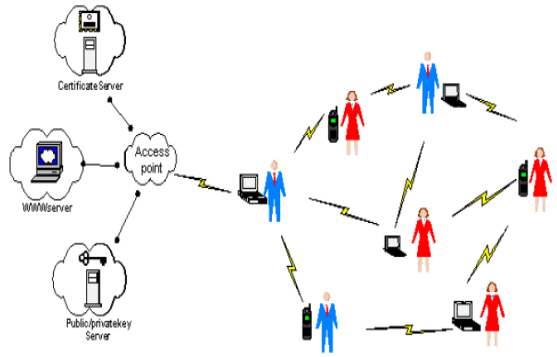

Fig. 2 : Mobile wireless ad hoc network

2. CHARACTERISTICS OF MOBILE AD-HOC NETWORK

a) Dynamic Topology: - The Nodes work in the mobile Ad-hoc Network con be change their properties time to time.

b) Low cost of Deployment:- Mobile Ad-hoc Network requires no expensive infrastructure such as copper wires, data cables, etc. because these networks deployed on the fly.

c) Fast Deployment:-Mobile Ad-hoc Network are very convenient and easy to use as compare to $WLAN_S$ .This networks does not require cables.

3. COMMUNICATION IN MOBILE AD-HOC NETWORK

In Mobile Ad-hoc Networks the nodes are used forward packet, routing and network management. The nodes work in the Mobile Ad-hoc Networks can communicate with each other directly without the use of wires. When the nodes are far from each other then they use rely On intermediate nodes to act as routers relay messages. For example , node A want to communicate with node D using the shortest path A-B-C-D as shown in figure 3. But Node A can used alternative path to reach the node D. A-E-F-C-D.

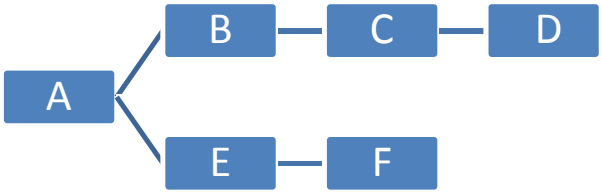

Figure 3:Communication between nodes in Mobile Adhoc networks

4. GENERAL ISSUE AND VULNERABILITIES ASSOCIATED WITH MOBILE AD-HOC NETWORK.

a) Wireless Links:-Mobile Ad-hoc Network is a wireless network and has a low band-width as compare to wired networks.

b) Distributed Network:-Mobile Ad-hoc Network is a distributed wireless network. There is no central server to maintain the clients, similar to peer-to-peer network.

c) Dynamic Topology:- The nodes are works in the Mobile Ad-hoc Network are in depended to each other. This network can be changed to time to time.

d)Addressing Scheme:-The IP addressing scheme is not apply on the Mobile Ad-hoc Network because this network is a decentralized in nature.

e) Security:- The Security issue in Mobile Ad-hoc Network are very difficult to achieve three goals of security confidentiality, integrity and authenticity.

f) Lock of a clear line of Defense:-Attacks can come from all directions because Mobile Ad-hoc Networks do not have a clear line of defenses.

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5. SECURITY ASPECTS OF MOBILE AD-HOC NETWORK

Wireless communication in Mobile Ad-hoc Network is less secure as compare to wired communication.In Mobile Ad-hoc Network have limted resources,such as bandwidth ,storage space, and processing capability. The following requirments need to be helpful for secure real-time connections.

a) Confidentiality:-confidentiality means that the information in the network is never show to unauthorized user.

b) Integrity:- Integrity ensure that the message is never altered or corrupted when transfer between two nodes.

c) Availability:-Availability ensure that the requested service are available at any time enen though there is any problem in the system.

d) Authenticity:-Authenticity is used in the Mobile Ad-hoc Network to determine a user's identity.

6. NEED OF STUDY

Mobile Ad-hoc Network need a more a study because it is a challenging research area for the last few years of its dynamic topology. It has Mobile Ad-hoc Network is to be considered as stand alone then It has limted application.When mannet user connect to the internet then they can better utilzation of network resources. But in the global environment requires new security threats to the existing attacks and passive attacks on MANET.

7. OBJECETIVES

In this paper different Security aspects will be discussed and how these security issue can be resolved?. The main objedctives of this papers are.

- The study and analysis of security threats and vulnerabilities in Mobile Ad-hoc network(MANET).
- To achieve optimum solution and countermeasures for the security threats in MANET.
- To study enlisting the challenges of MANET.

8.SCOPE OF RESEARCH

Mobile Ad-hoc Network brings new security challenges to the netwrok desing. Mobile Ad-hoc Network their unique charactersticks, are generally more weak to inforamtion and physical security threats than wired networks.

In this papers various security requirments for Mobile Ad-hoc Network will be examine and the different types of threats on Ad-hoc Network faces.In this paper identifies the new challenges and appartunities pased by this new networking environmnet and examine new approaches to secure its communication.

9. CONCLUSION

In this paper we discuss the security issue in Mobile Ad-hoc Networks. A Mobile Ad-hoc Network needs high level of security as compare to the traditional wired networks. The aim of this paper is to discuss different aspects of security threats and to achieve best solution for these types of security threats with challenges of MANET.

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