Security in Mobile Ad hoc Networks

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1   Problem

Ad hoc networks do not rely on any pre-existing infrastructure such as routers. Each node participates in routing and communication. Some of the problems faced are: the vulnerability of the network, dynamic changes of the topology, mobility of the nodes, etc Also these nodes are constrained in bandwidth, power consumption, and computer power. Wireless links make the nodes more susceptible to attacks. For the security of the mobile ad hoc networks, a group key management system has to be established along with the routing protocol.

Motivation There have been a number of researches on this topic based on key management system, and routing protocols. The key management system can be further classified into : group key management, hierarchical key management, dynamic key management, etc My system would provide an efficient and secure Group Key Management system such as Diffie-Hellman algorithm with the help of a multicast routing protocol such as Ad-hoc On-demand Distance Vector (AODV) [2].

Related Work. There have been a number of methods used to secure group key management. I would like to use hierarchical key management system or dynamic key management system. The hierarchical approach is suitable for a large network. The dynamic approach also supports large networks but it has communication overhead.

2   Methodology

I would be needing the Network Simulator (NS-2 or NS-3) which is best suited for simulating the ad hoc networks. The number of nodes in the network (for simulation purpose) can vary from 50 to 70. Random waypoint mobility can be used to make the nodes mobile [1].

3   Evaluation

The method used for the simulation can be compared with the other methods for communication overhead, key generation and regeneration time. A graph can be plotted to show the results.

4   Evaluation Outcomes

I expect my method to be better with respect to the the above mentioned processes, when compared to the other methods like multicast group key management, or tree based group key management.

References

[1] Renuka A. and K. C. Shet. Hierarchical approach for key management in mobile ad hoc networks. *CoRR*, abs/0910.0227, 2009.

[2] M. Dasgupta, S. Choudhury, and N. Chaki. A secure hypercube based team multicast routing protocois (s-htmrp). In *Advance Computing Conference, 2009. IACC 2009. IEEE International*, pages 1265 –1269, march 2009.