

International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

Volume 2, Issue 7, May 2022

# Detection and Security Analysis of Wormhole Attacks in MANETS

Nimisha C. J.<sup>1</sup> and Dr.Geetha G.<sup>2</sup>

Department of Electronics and Communication Engineering NSS College of Engineering, Palakkad, Kerala<sup>1,2</sup>

**Abstract**: This paper includes the survey of detection and security analysis of wormhole attack in MANET. MANET stands for Mobile Ad-hoc Network which is also called a wireless Ad-hoc network that consists of a set of mobile nodes connected wirelessly in a self- configured, self-healing network without having a fixed infrastructure. MANETs are susceptible to many security attacks as they use wireless medium for communication such as wormhole attacks. This attack involves two or more than two malicious nodes and the data packet from one end of the malicious node is tunnelled to the other malicious node at the other point, and these data packets are broadcasted. Intrusion detection systems are the solution for detecting wormhole attacks in MANET. This work deals with the various detection techniques and the types of wormhole modes in order to analyse the wormhole attack.

## REFERENCES

- [1] Vrutik Shah and Dr. Nilesh Modi, "Responsive Paramete based on AntiWorm Approach to Prevent Wormhole Attack in Ad hoc Networks", ACEEE Int. J. on Network Security, Vol. 5, PP. No. 1, January 2014.
- [2] Elhadi M. Shakshuki, Nan Kang, and Tarek R. Sheltami, "EAACK—A Secure Intrusion- Detection System for MANETs", IEEE Transactions on Industrial Electronics, Vol. 60, No. 3, March 2013.
- [3] Kamini Singh and Gyan Singh, "Review on Wormhole Security and Their Detection Scheme", International Journal of Advanced Research in Computer Science and Software Engineering, ISSN: 2277 128X, Volume 4, Issue 1, January 2014.
- [4] Hao Yang, Haiyun Luo, Fan Ye, Songwu Lu, And Lixia Zhang, "Security in Mobile Ad Hoc Networks: Challenges and Solutions", IEEE Wireless Communications, February 2004.
- [5] M. Sookhak, M. R. Eslaminejad, M. Haghparastand I.in FauziI Snin "Detection Wormhole in Wireless Ad hoc networks" IJCST, Volume 2, Issue 7, October 2011.
- [6] Mohit Jain and Himanshu Kandwal "A Survey on Complex Wormhole Attack in Wireless Ad Hoc Networks", International Conference on Advances in Computing, Control, and Telecommunication Technologies, IEEE computer society 978-0-7695-3915- 7/09 in 2009.
- [7] Zubair Ahmed Khan and M. Hasan Islam, "Wormhole Attack: A new detection technique", IEEE, 978-1-4673-4451-7/12, 2012.
- [8] Venkata C. Giruka and Mukesh Singhal, "Secure Routing in Wireless Ad-Hoc Networks", Springer Science, Chapter 6, Wireless Network Security, 2007.
- [9] Sudhir Agrawal, Sanjeev Jain, and Sanjeev Sharma, "A survey of routing attacks and Security measures in mobile Ad hoc networks" in journal of computing volume 3, issue, ISSN2151-9617 1, January 2011.
- [10] Yih-Chun Hu, Adrian Perrig and David B. Johnson, "Packet Leashes: A Defense against Wormhole Attacks in Wireless Networks", IEEE INFOCOM 2003.
- [11] Yashpal singh Gohil, Sumegha Sakhreliya, and Sumitra Menaria, "A Review On: detection and prevention of wormhole attack in MANET", International Journal of Scientific and Research Publications, Volume 3, Issue 2, ISSN 225.
- [12] Majid Meghdadi, SuatOzdemir and InanGüler —A Survey of Wormhole-based Attacks And their Countermeasures in Wireless Sensor Networks in IETETECHNICAL REVIEW, VOL 28, ISSUE 2, MAR-APR 2011.
- [13] Yih-Chun Hu, Adrian Perrig and David B. Johnson, "Wormhole Attacks in Wireless Networks", Member, IEEE.



International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

#### Volume 2, Issue 7, May 2022

- [14] Srdjan C apkun, LeventeButtya n, and Jean-Pierre Hubaux, "SECTOR: Secure Tracking of Node Encounters in Multi- hop Wireless Networks", ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN), October 31,2003.
- [15] Nishant Sharma and Upinderpal Singh, "Various Approaches to Detect Wormhole Attack in Wireless Sensor Networks", International Journal of Computer Science and Mobile Computing, Vol.3 Issue.2, February-2014.
- [16] Hon Sun Chiu and King-Shan Lui, "DelPHI: Wormhole Detection Mechanism for Ad Hoc Wireless Networks", IEEE, O-7803-9410-O/06/, 2006.
- [17] Soo-Young Shin and Eddy Hartono Halim, "Wormhole Attacks Detection in MANETs using Routes Redundancy and Time-based Hop Calculation", IEEE,978-1-4673- 4828- 7/12, 2012.
- [18] Pushpendra Niranjan, Prashant Srivastava, Raj kumar Soniand RamPratap, "Detection of wormhole attack using hop count and time delay analysis", International Journal of Scientific and Research Publications, Volume 2, Issue 4, April 2012.
- [19] Jakob Eriksson, Srikanth V. Krishnamurthy, and Michalis Faloutsos, "TrueLink: A Practical Countermeasure to the wormhole Attack in Wireless Networks" 14th IEEE International Conference on Network Protocols, pp. 75-84, 2006.
- [20] Z. Tun and A. H. Maw, "Wormhole attack detection in wireless sensor networks," 2008.
- [21] Xu Li, Nathalie Mitton, Amiya Nayak, and Ivan Stojmenovic, "Localized Load Balancing for Geographic Routing in Wireless Ad Hoc Networks", in International Conference on Communications - Wireless Networks Symposium - IEEE ICC-WN 2012.
- [22] Majid Meghdadi, SuatOzdemir and InanGüler —A Survey of Wormhole- based Attacks And their Countermeasures in Wireless Sensor Networks, in IETETECHNICAL REVIEW, VOL 28, ISSUE 2, MAR-APR 2011.
- [23] Yih-Chun Hu, Adrian Perrig and David B. Johnson, "Wormhole Attacks in Wireless Networks", Member, IEEE.
- [24] Srdjan C apkun, LeventeButtya n, and Jean-Pierre Hubaux, "SECTOR: Secure Tracking of Node Encounters in Multi- hop Wireless Networks", ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN), October 31,2003.
- [25] Nishant Sharma and Upinderpal Singh, "Various Approaches to Detect Wormhole Attack in Wireless Sensor Networks", International Journal of Computer Science and Mobile Computing, Vol.3 Issue.2, February-2014.
- [26] Hon Sun Chiu and King-Shan Lui, "DelPHI: Wormhole Detection Mechanism for Ad Hoc Wireless Networks", IEEE, O-7803-9410-O/06/, 2006.
- [27] Soo-Young Shin and Eddy Hartono Halim, "Wormhole Attacks Detection in MANETs using Routes Redundancy and Time-based Hop Calculation", IEEE,978-1-4673- 4828- 7/12, 2012.
- [28] PushpendraNiranjan, PrashantSrivastava, Raj kumar Soniand RamPratap, "detection of wormhole attack using hop count and time delay analysis", International Journal of Scientific and Research Publications, Volume 2, Issue 4, April 2012.
- [29] Jakob Eriksson, Srikanth V. Krishnamurthy, and Michalis Faloutsos, "TrueLink: A Practical Countermeasure to the wormhole Attack in Wireless Networks" 14th IEEE International Conference on Network Protocols, pp. 75-84, 2006.
- [30] Z. Tun and A. H. Maw, "Wormhole attack detection in wireless sensor networks," 2008.
- [31] Xu Li, Nathalie Mitton, Amiya Nayak, and Ivan Stojmenovic, "Localized Load Balancing for Geographic Routing in Wireless Ad Hoc Networks" in International Conference on Communications - Wireless Networks Symposium - IEEE ICC-WN 2012.
- [32] Parag Kumar Guha Thakurta, Rajeswar Guin and Subhansu Bandyopadhyay," An Efficient Approach for Detecting Wormhole Attacks in AODV Routing Protocol", Springer 2018.
- [33] Parvinder Kaur, Dalveer Kaur, Rajiv Mahajan," Wormhole Attack Detection Technique in Mobile Ad Hoc Networks", Springer 2017.
- [34] Tu T. Vo1, Ngoc T. Luong, Doan Hoang," MLAMAN: a novel multi-level authentication model and protocol for preventing wormhole attack in mobile ad hoc network", Springer 2018.
- [35] Singla Neelima, Singh Ramanjeet," Wormhole Attack Prevention and Detection in MANETs Using HRL

Copyright to IJARSCT www.ijarsct.co.in

# **IJARSCT**



International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)

### Volume 2, Issue 7, May 2022

Method", International Journal of Advance Research, Volume 3, Issue2,2017.

- [36] Praveen Kataria ,mithilesh kumar ," Hop Count Based Conjunction Control Wormhole Detection Approach for MANET ", International Journal of Scientific Research & Engineering Trends Volume 2, Issue 2,2016.
- [37] Dhruvi Sharma, Vimal Kumar and Rakesh Kumar," Prevention of Wormhole Attack Using Identity Based Signature Scheme in MANET", Springer India 2016.
- [38] Farhan Abdel-Fattah, Khalid A. Farhan, Feras H. Al-Tarawneh, Fadel AlTamimi"Security Challenges and Attacks in Dynamic Mobile Ad Hoc Networks MANETs", IEEE 2019.
- [39] Amar Singh Chouhan, Prof. Vikrant Sharma, Upendra Singh, "A Modified AODV Protocol to Detect and Prevent The Wormhole using Hybrid Technique", International Conference on Electronics, Communication and Aerospace Technology(ICECAT), IEEE 2017.
- [40] Parvinder Kaur, Dalveer Kaur, Rajiv Mahajan, "Simulation Based Comparative Study of Routing Protocols Under Wormhole Attack in Manet", Springer 2017.ia 2016.