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Optimizing On Demand Weight -Based Clustering Using Trust Model for Mobile Ad Hoc Networks

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Abstract: Mobile ad hoc networks are growing in popularity due to the explosive growth of modern devices with wireless capability such as laptop, mobile phones, PDA, etc., makes the application more challenging. The mobile nodes are vulnerable to security attacks. To protect the ad hoc network it is essential to evaluate the trust worthiness. The proposed TWCA is similar to WCA in terms of cluster formation and cluster head election. However, in WCA security features are not included. The proposed TWCA is a cluster based trust evaluation, in which the mobile nodes are grouped into clusters with one cluster head. It establishes trust relationship for the cluster based on the previous transaction result. The simulation result confirms the efficiency of our scheme than the WCA and SEMC.

Keywords: Ad Hoc networks, Clustering, Security, Trust.

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References

[1]   A.Rachedi, A.Benslimane, "Trust and mobility-based clustering algorithm for secure mobile ad hoc networks",Proceeding of ICSNC'06, IEEE Computer Society Press, Tahiti, 2006, pp.72-77.

[2]   M.Y.Hsieh, Y.M.Huang, and H.C.Chao, "Adaptive security design with malicious node detection in cluster-based sensor networks", Computer Communications, Elsevier B.V.,2007, pp.2385-2400..

[3]   S.Jin, C.park, D.Choi, K.Chung, and H.Yoon, "Cluster-based trust evaluation schemes in an ad hoc networks",ETRI Journal, Seoul,2005,pp,465-468.

[4]   M.E. Elhdhili, L.B Azzouz, and F. Kamoun, "CASAN:Clustering algorithm for security in ad hoc networks", Computer Communications, Elsevier B.V..,2008,pp.2972-2980.

[5]   PKIX Workingg Group, "Internet X.509 Public Key Infrastructure,,"draft-ietf-pkix-roadmap- 06.txt,2002.

[6]   J.Kohl and B.neuman, "The Kerberous nnetwork authentication service(version 5)," RFC-1510,1991.

[7]   L.Zhon and Z.J.Hass,"Securing Ad Hoc Networks," IEEE Networks Magazine, Vol.13,Issue 6,pp.24- 30,1999.

[8]. J-P. Hubaux, L. Buttyan, and S. Capkun, "The Quest for Security in Mobile Ad Hoc Networks," Proceedings of the 2001 ACM International Symposium on Mobile ad hoc networking & computing, Long Beach, CA, USA, pp. 146-155, October 4-5 2001.

[9].Chen Alguo, XU Guoai, YANG-Yixian, "A Cluster Based Trust Model For Mobile Ad Hoc networks," Wireless Communication , 2008,WiCOM'08, pp. 1-4.

[10].Edith.C.H.Ngai, and Michael R.Lyu, "Trust and Cluster Based Authentication Services in Mobile Ad

nd

Hoc Network," 2 international workshop on mobile distributed computing (MDC) ,2004 ,pp.582-587

[11]. A. B. MaDonald and T. F. Znati, "A Mobility-based Frame Work for Adaptive Clustering in Wireless Ad Hoc Networks," IEEEJSAC, vol. 17, Aug. 1999., pp. 1466–87.

[12]. P. Basu, N. Khan, and T. D. C. Little, "A Mobility Based Metric for Clustering in Mobile Ad Hoc Networks," in Proc. IEEE ICDCSW'01, Apr. 2001, pp. 413–18

[13]   A. B. McDonald and T. F. Znati, "Design and Performance of a Distributed Dynamic Clustering Algorithm for Ad-Hoc Networks," in Proc. 34th Annual Simulation Symp., Apr. 2001, pp. 27–35.

[14]   A. D. Amis and R. Prakash, "Load-Balancing Clusters in Wireless Ad Hoc Networks," in Proc. 3rd IEEE ASSET'00, Mar. 2000, pp. 25–32.

[15]   J. Wu et al., "On Calculating Power-Aware Connected Dominating Sets for Efficient Routing in Ad Hoc Wireless Networks," J. Commun. and Networks, vol. 4, no. 1, Mar. 2002, pp. 59–70.

[16]   J.-H. Ryu, S. Song, and D.-H. Cho, "New Clustering Schemes for Energy Conservation in Two-Tiered Mobile Ad-Hoc Networks," in Proc. IEEE ICC'01, vo1. 3, June 2001, pp. 862–66.

[17]   T. Ohta, S. Inoue, and Y. Kakuda, "An Adaptive Multihop Clustering Scheme for Highly Mobile Ad Hoc Networks," in Proc. 6th ISADS'03, Apr. 2003.

[18]   M. Chatterjee, S. K. Das, and D. Turgut, "An On-Demand Weighted Clustering Algorithm (WCA) for Ad hoc Networks," in Proc. IEEE Globecom'00, 2000, pp. 1697–701.

[19]   D. Turgut, S. Das, R. Elmasri, and B. Turgut, "Optimizing clustering algorithm in mobile ad hoc networks using genetic algorithmic approach,"in Proceedings of GLOBECOM 2002, November 2002.

[20]   D. Turgut, B. Turgut, R. Elmasri, and T. V. Le, "Optimizing clustering algorithm in mobile ad hoc networks using simulated annealing," in Proceedings of WCNC 2003, March 2003.

[21]   C. Ji, Y. Zhang, S. Gao, P. Yuan, and Z. Li, "Particle swarm optimization for mobile ad hoc networks clustering," in Networking, Sensing and Control, 2004 IEEE International Conference on, vol. 1, 2004, pp. 372– 375.

[22]   Mohamed Elhoucine Elhdhili, Lamia Ben Azzouz, Farouk Kamoun. A Totally Distributed Cluster Based KeyManagement Model for Ad hoc Networks. Med-Hoc-Net 2004, The Third Annual Mediterranean Ad Hoc Networking Workshop.

[23]   M. Bechler, H.-J. Hof, D. Kraft, F. Pählke, L. Wolf. A Cluster-Based Security Architecture for Ad Hoc Networks. IEEE, INFOCOM 2004.

[24]   Panagiotis Papadimitratos, and Zygmunt J. Haas. Secure Data Communication in. Mobile Ad Hoc Networks. IEEE Journal on Selected Areas In Communications, Vol. 24,No. 2, 2006 PP. 343,356.

[25]   Fatiha Djemili Tolba, Damien Magoni, Pascal Lorenz, "A Stable Clustering Algorithm for Highly Mobile Ad Hoc Networks," icsnc, pp.11, Second International Conference on Systems and Networks Communications (ICSNC 2007), 2007

[26]   A. Ephremides, J. E. Wieselthier and D. J. Baker, "A design concept for reliable mobile radio networks with frequency hopping signaling," Proc. IEEE, vol. 75, no. 1, Jan. 1987, pp. 56-73.

[27]   A. Bhatnagar and T. G. Robertazzi, "Layer Net: a new self-organizing network protocols," Proc. IEEE MILCOM '90, pp. 845-849.

[28]   M. Gerla and T. C. Tsai, "Multicluster, mobile, multimedia radio network," ACM-Baltzer J. Wireless Networks, vol. 1, no. 3, 1995, pp. 255-65.

[29]   A. Alwan, R. Bagrodia, N. Bambos et al.,"Adaptive mobile multimedia networks," IEEE Personal Commun., Apr. 1996, pp. 34-51.

[30]   A. B. McDonald and T. F. Znati, "A mobilitybased framework for adaptive clustering in wireless ad hoc networks," IEEE J. Select. Areas Commun., vol. 17, no. 8, Aug. 1999, pp. 1466-1487.

[31]   C. R. Lin and M. Gerla, "Adaptive clustering for mobile wireless networks," IEEE J. Select. Areas Commun., vol.15, no. 7, Sep. 1997, pp. 1265-1275.

[32]   W. Chen, N. Jain and S. Singh, "ANMP: ad hoc network management protocol," IEEE J. Select. Areas Commun., vol. 17, no. 8, Aug. 1999, pp. 1506-1531.

[33]   C. R. Lin and M. Geria, "Real-time support in multihop wireless network," ACM-Baltzer J. Wireless Networks, vol. 5, no. 2, 1999, pp. 125-135.

[34]   S. Chen and K. Nahrstedt, "Distributed quality-of-service routing in ad hoc networks," IEEE JSAC, vol. 17, no. 8, Aug. 1999, pp. 1488-1505.

[35]   A. Iwata, C.-C. Chiang, G. Pei, M. Gerla and T.-W. Chen, "Scalable routing strategies for ad hoc wireless networks," IEEE J. Select. Areas Commun., vol. 17, no. 8, Aug. 1999, pp. 1369-1379.

ENERGY EFFICIENCY IN AD HOC NETWORKS

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ABSTRACT

Wireless Ad Hoc Networks comprise a fast developing research area with a vast spectrum of applications. Wireless sensor network systems enable the reliable monitoring of a variety of environments for both civil and military applications. The Energy efficiency continues to be a key factor in limiting the deployability of ad-hoc networks. Deploying an energy efficient system exploiting the maximum lifetime of the network has remained a great challenge since years. The time period from the instant at which the network starts functioning to the time instant at which the first network node runs out of energy, i.e. the network lifetime is largely dependent on the system energy efficiency. In this paper, we look at energy efficient protocols, which can have significant impact on the lifetime of these networks. The cluster heads get drain out maximum energy in the wireless ad hoc networks. We propose an algorithm that deals with minimizing the rate of dissipation of energy of cluster heads. The algorithm LEAD deals with energy efficient round scheduling of cluster head allocation of nodes and then followed by allocation of nodes to the cluster heads maximizing network lifetime using ANDA [1, 2]. We compare our results with the previous works.

KEYWORDS

Clustering, ANDA, energy efficiency, LID, energy factor, network lifetime, LEACH, LEAD, network, energy, efficiency, dissipation, Ad hoc

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REFERENCES.

[1]   Chiasserini, C.F.,Chlamtac, I.,Monti,P.,Nucci,A.: Energy Efficient Design of wireless ad-hoc network.LNCS 2006, vol. 2345, pp. 376-386.

[2]   Ephremides, A., Wieselthier, J.E., Baker, D.J.: Proc.IEEE, VOL.75, NO.1, January(1987).

[3]   Baker, D.J., Ephremides, A.: The architectural organization of a mobile radio network via a distributed algorithm.In: IEEE Transactions on Communications, pp.
1694-1701, November (1981)

[4]   Kwon, T., Gerla, M.: Clustering with Power Control, Proc.MILCOM'99,November (1999).

[5]   Heinzelman, W.B., Chandrakasan, A., Balakrishnan, H.: Energy-Efficient Communication Protocols for Wireless Microsensor Networks.In Proceedings of Hawaiian InternationalConference on Systems Science, January (2000).

[6]   Heinzelman, W.B.: Application-Specific Protocol Architectures for Wireless Networks, PhD thesis, Massachusetts Institute of Technology, June (2000).

[7]   Akyildiz, I.F. et al.: Wireless sensor networks: a survey, Computer Networks, Vol.38, pp. 393- 422, March (2002).

[8]   Hill, J.: System Architecture for Wireless Sensor Networks, PhD Thesis, Spring 2003.

[9]   Manjeshwar, A., Agrawal, D.P.: TEEN : A Protocol for Enhanced Efficiency in Wireless Sensor Networks,1st International Workshop on Parallel and Distributed Computing Issues in Wireless Networks and Mobile Computing, San Francisco, CA, April (2001).

[10]   Jiang, M., Li, J., Tay, Y.C.: Cluster Based Routing Protocol,Internet Draft, 1999.

[11]   Royer, E.M., Toh, C.K.: A Review of Current Routing Protocols for Ad-Hoc MobileWireless Networks.In:IEEE Personal Communications Magazine, pages 46-55, April(1999).

[12]   Intanagonwiwat, C., Govindan, R.,Estrin, D.: Directed Di_usion: A Scalable and Robust Communication Paradigm for Sensor Networks,In Proceedings of the 6th Annual ACM/IEEE International Conference on Mobile Computing and Networking(MOBICOM), pages 56-67, August (2000).

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A VARIABLE BIT-RATE ON- DEMAND ROUTING PROTOCOL FOR MOBILE AD HOC NETWORKS

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ABSTRACT

Mobile ad hoc networks are facing new challenges including routing, quality of service and reliability. Quality of service can be achieved through the use of bit rate transmission. A modified variable bit rate on demand routing protocol for mobile adhoc network is presented in this paper. We designed, implemented and studied the performance of a Variable Bit-rate On demand Routing (VBOR) protocol which is based on the Adhoc On-demand Distance Vector (AODV) protocol. Here, the mode of transmission used for simulation purpose is variable bit rate. We calculate the residual power information of the node to select the best and stable route in between source and destination. Various QoS parameters such as average energy consumption, control overhead, data transmission delay, packet delivery ratio and throughput are studied and analyzed. The results are compared with the existing AODV protocol and the results are encouraging.

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References:

[1] Perkins, C. E. and Bhagwat, P. (1994) 'Highly dynamic destination sequenced distance-vector routing (DSDV) for mobile computers' *SIGCOMM '94: Proc. Conference on communications architectures, protocols and applications.* New York, USA: ACM Press, pp.234-244.

[2] C. Perkins, .Ad-hoc on-demand distance vector routing,. in MILCOM '97, Panel on Ad Hoc Networks, 1997.

[3] Johnson, D. and Maltz, D.,(1996) 'Dynamic source routing in ad hoc wireless networks' *Mobile Computing (ed. T. Imielinski and H. Korth), Kluwer Academic Publishers*, Dordrecht, The Netherlands.

[4] Elizabeth M. Royer, (1999), A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks", *IEEE Personal Communications*, pp 46-55.

[5] http://citeseer.ist.psu.edu/531710.html.

[6] Ioannis Broustis, Gentian Jakllari, Thomas Repantis, and Mart Molle, "A Comprehensive Comparison of Routing Protocols for Large-Scale Wireless MANETs", *http://www.cs.ucr.edu/~mart/preprints/iwwan06.pdf*

[7] Charles E. Perkins and Elizabeth M. Royer. "Ad hoc On-Demand Distance Vector Routing." *Proceedings of the 2nd IEEE Workshop on Mobile Computing Systems and Applications*, New Orleans, LA, February 1999, pp. 90-100.

[8] M L Sharma,Noor Fatima Rizvi,Nipun Sharma,Anu Malhan,Swati Sharma, "Performance Evaluation of MANET Routing Protocols under CBR and FTP traffic classes". *International Journal of Computer Technology and Applications*. Vol 2 (3), 392-400

[9] Lajos Hanzo II, Member, IEEE, and Rahim Tafazolli, Senior Member, IEEE, "QoS-Aware Routing and Admission Control in Shadow-Fading Environments for Multirate MANETs". *IEEE TRANSACTIONS ON MOBILE COMPUTING*, VOL. 10, NO. 5, MAY 2011

[10] George Adam, Christos Bouras, Apostolos Gkamas, Vaggelis Kapoulas, Georgios Kioumourtzis, Nikos Tavoularis, "Performance Evaluation of Routing Protocols for multimedia transmission over Mobile Ad hoc Networks". *4th Joint IFIP Wireless and Mobile Networks Conference, Toulouse, France*, October 26 – 28 2011

[11] Kunavut, Kunagorn and Teerapat Sanguankotchakorn. "Performance Evaluation of Ad Hoc Routing Protocols to Deliver MPEG-4 Traffic." *Proceedings of the 12th IEEE International Conference on Communication and Technology (IEEE ICCT 2010).* Nanjing, China. November 11-14, 2010, pp. 207-210.

[12] Himabindu Pucha, Saumitra M. Das, Charlie Hu, Y., (2004) "The erformance impact of traffic patterns on routing protocols in mobile ad hoc networks ". MSWiM '04, Proceedings of the 7th ACM international symposium on Modeling, analysis and simulation of wireless and mobile systems Pages 211-219, .