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A SURVEY ON LOAD BALANCING ALGORITHMS IN MOBILE AD HOC NETWORKS

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ABSTRACT

Mobile ad hoc networks (MANETs) are self continuously self-configuring infrastructure-less network of mobile devices connected without wires. In multi hop wireless networks CSMA techniques enable the same radio resources to be used in distinct locations, leading to increased bandwidth efficiencies at the cost of possible collisions due to the hidden terminal problem. MANETs are increasing as applications evolve, which increases the importance of bandwidth efficiency, uniform load distribution protocols are useful for highly loaded MANETs. These protocols are not suited for non-uniform load distributions due to lack of on demand dynamic channel allocation mechanism. Hence a novel MAC protocol, CDCA-TRACE is used for cooperative load balancing and Dynamic channel allocation by improving the throughput, energy-consumption and inter-packet delay variation (IPDV).

Keywords: Load Balancing, Throughput, Migration Time, Overhead

INTRODUCTION

World-wide web has been developed for more than forty years recently many researchers are studying networks based on novel communication techniques, especially wireless communications which allow hosts to roam without the constraints of wired connections. People can deploy a wireless network easily and quickly. Hosts and routers in a wireless network can move around. In the recent years Mobile Ad- hoc network has found applications especially to overcome the limitationofBandwidthinwireless communication. MANET (Mobile Ad hoc Network) is the routing problem, which is aggravated by frequent topology changes due to node movement, radio interference and network partitions. The proactive approaches attempts to maintain routing information for each node in the network at all times, whereas the reactive approaches only find new routes when required and other approaches make use of geographical location information for routing. The biological swarms like ants or honeybees often contain thousands of individuals. They perform extraordinarily complex tasks of global optimization and resourceallocationusingonly local information.

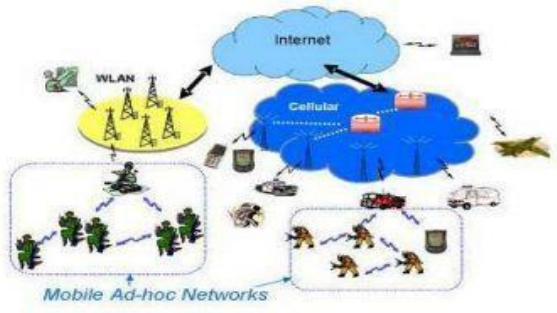

Figure 1: Mobile Ad-hoc Network

Mobile Adhoc networks nodes exchange information items in a typical networks, data caching is a fully distributed scheme where each node upon receiving requested information determines the cache drop time of the information or which content to replace to make for newly arrived information. These decisions are made depending on the perceived presence of the content in the nodes proximity, whose estimation does not cause any additional overhead to the information sharing system. Consider both cases of nodes with large and small-sized caches. For large-sized caches, we devise a strategy where nodes, independent of each other, decide whether to cache some content and for how long. Protocols are suited for non-uniform load distributions as uncoordinated channel protocols our analysis designs the lightweight dynamic channel allocation mechanism and load balancing coordinated protocols that utilize these mechanisms to improve performance in terms of throughput energy consumption and inter packet delay variation.

In the multihop wireless network, the CSMA method used to enable the similar radio resources to be allocated in different b locations; it leads to increased bandwidth efficiency due to hidden terminal problems. Various reservation techniques can be used to over the hidden terminal problem. Before the packet transmission, RTS/CTS packet exchange mechanism used to overcome the hidden terminal problem. The modifications of RTS/CTS mechanism has to be proposed to increase the bandwidth efficiency. In coordinated MAC protocol, the channel controllers perform the channel assignment with channel reuse concept .the concept of cellular network used to access the channel through the base station, which has the fixed infrastructure. There are two type of channel allocation used in cellular system that are centralized and distributed allocation scheme. In centralized dynamic channel allocation method, the central coordinator can assign the available channels to the various cells. This type of systems having the high overhead so it cannot be suitable to MANETs .Distributed allocation, each cell in the network is assigned a number of channels, the channel are exchanged between the adjacent cells. This method cannot be directly applied to the Manet.

LITERATURE SURVEY

M.Felegyhazi, M.Cagalj, S.Bidokhti, and J.P.Hubaux have proposed Non-cooperative Multi-radio Channel Allocation in Wireless Networks. In this paper they have explained a problem of multiradio channel allocation. Here, the channel allocation shows a result of load balancing solution. There are three channel allocation schemes are used Fixed Channel Allocation (FCA), Dynamic Channel Allocation (DCA) and Hybrid Channel Allocation. In Fixed Channel Allocation same number of channels is permanently allocated and it will perform well under traffic load but it will not adapt to changing traffic conditions. To overcome this problem Dynamic Channel Allocation is proposed. In Dynamic Channel Allocation there is no constant relationship between base station and their respective channels all the channels are available for each base station and they are assigned dynamically. But, it performs worse than Fixed Channel Allocation in terms of heavy traffic load. The hybrid Channel allocation will combine the above two methods. The problem of this technique it is not fit for multi hop communication and the time delay will occur in terms of packet transmission.

Celimuge Wu, Kazuya Kumekawa, and Toshihiko Kato has proposed A MANET protocol considering link stability and bandwidth efficiency. Based on Adhoc on-demand distance vector routing protocol (AODV) they increase the bandwidth efficiency. For selecting a route they use Q-Learning algorithms this will increase the bandwidth efficiency and also it will reduce the number of route errors. But, it is used only for the communication. This method is not fit for multi hop communication.

JiaweiXie, Amitabha Das, Sukumar Nandi , Anil K. Gupta have proposed Improving reliability of IEEE 802.11 In this paper they have introduced a Broadcast scheme for Multicasting in Mobile Adhoc networks. Multi casting in Mobile Adhoc Networks are mainly based on MAC layers. Here, the RRAR (Round Robin Acknowledge and Retransmit) mechanism is used. If any packet is lost during packet transmission between source and destination means it will retransmit the packet again. So, reliability is improved and also delay is reduced. Each node consumes more energy for transmitting the packet. This literature survey says about the problem of packet delay during packet transmission and also the problem of energy consumption. In our proposed systems, that delay of packets will be reduced, and the nodes energy consumption will be reduced.

ANALYSIS OF LOAD BALANCING ALGORITHMS

There are many algorithms for load balancing, due to which higher throughput and improved response time in distributed systems is achieved. Each algorithm has both advantages and shortcomings. A comparative analysis of different load balancing algorithms by various efficiency metrics. The efficiency of the load balancing algorithms is determined by several indicators, which are listed below,

a) Throughput

This indicator is used to assess the total number of tasks that are successfully completed. High bandwidth is required for the overall system performance.

b) Overhead

Overhead is associated with the operation of any load balancing algorithm, and it indicates the cost of the processes involved in the task and redistribution process. Overhead should be as low as possible.

c) Fault tolerance

This indicator measures the ability of the algorithm to perform the load balancing uniformly in the event of any failure. The good load balancing algorithm must be very insensitive to faults.

d) Migration time

It is defined as the total time of transition of a task from one node or resource to another. It should be minimizedResponse time It is measured as the time interval between sending a request and receiving a response. It should be minimized in order to improve overall performance.

e) Resource utilization

The indicator is used to ensure the appropriate harnessing of all the system resources. This indicator must be optimized for efficiency of the load balancing algorithm.

f) Scalability

It is the ability of the algorithm to perform uniform load balancing in the system according to the requirements upon increasing the number of nodes. The preferred algorithm is highly scalable.

g) Performance

It may be defined as the system efficiency. This indicator should be improved at a reasonable overhead, for example, reducing the response time and preserving an allowable delay.

CONCLUSION

The most used load balancing algorithms of distributed systems are classified according to different types in this work. Based on the performed analysis of classification types of the load balancing algorithms the scope of each type of algorithms is indicated, the algorithms type's necessary operation requirements are defined, defaults of each type of algorithms are shown. In this way one can select a particular type of the load balancing algorithm based on the specifics of a particular project or executable task, and the goals to be achieved. The description of the main features of load balancing algorithms, analysis of their advantages and defaults are also presented in this work. A comparative analysis of different load balancing algorithms on various performance metrics is carried out, i.e., the

efficiency indicators are shown for each algorithm used in it. It is planned to realize a comparative analysis of the load balancing algorithms with different capacity in a variety of distributed systems: cloud, cluster and grid systems.

REFERENCES:

[1] B. Tavli, and W. B. Heinzelman, "MH-TRACE: Multi hop time reservation using adaptive control for energy efficiency," IEEE J. Sel. Areas Commun., vol. 22, no. 5, pp. 942–953, Jun. 2004.

[2] Bora karaoglu, Wendi Heinzelman,. "Cooperative load balancing and dynamic channel allocation for cluster- based Mobile Ad Hoc Networks"IEEE Trans. Mobile Comp.May 2015.

[3] A.Raniwala and T. ckerChiueh, "Architecture and algorithms for an IEEE 802.11-based multi-channel wireless mesh network," in Proc. IEEE 24th Annu. Joint Conf. IEEE Comput.Commun. Soc., Mar 2005, vol. 3, pp. 2223–2234.

[4] M. Kappes, "An experimental performance analysis of {MAC} multicast in 802.11b networks for VOIP traffic," Comput.Commun., vol. 29, no. 8, pp. 938–948, 2006.

[5] M. Felegyhazi, M. Cagalj, S. Bidokhti, and J.- P.Hubaux, "Non cooperative multi-radio channel allocation in wireless networks," in Proc. IEEE 26th Conf. Comput.Commun., May. 2007, pp. 1442–1450.

[6] L. Gao, and X. Wang, "A game approach for multi- channel allocation in multi -hop wireless networks," in Proc. 9th ACM Int. Symp. Mobile Ad Hoc Netw.Comput., 2008, pp. 303–312.

[7] B. Karaoglu, T. Numanoglu, and W. Heinzelman, "Adaptation of TDMA parameters based on network conditions," in E Wireless Commun.Netw., Apr. 2009, pp. 1–9.

[8] B. Karaoglu, T. Numanoglu, and W. Heinzelman, "Analytical performance of soft clustering protocols," Ad Hoc Netw., vol. 9, no. 4, pp. 635–651, Jun. 2011.

[9] B. Karaoglu and W. Heinzelman, "A dynamic channel allocation scheme using spectrum sensing for mobile ad hoc networks," in Proc. IEEE Global Telecommun. Conf., 2012.