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QoS Analysis of Wireless Network using Load Balancing Approach

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ABSTRACT: Nodes in wireless networks especially Mobile adhoc networks do not have any fixed infrastructure. These networks do not have any fixed infrastructure. The data packets should travel across the network and reach the destination from the source file. Due to high mobility the table-driven routing protocols routes are either stale or invalid due to high mobility. But the on demand routing protocols concentrate their routing only in the central locating nodes. The nodes which are heavily loaded in the network leads to congestion, energy limitation and bandwidth. In this paper the taxonomy of load balancing technique is analyzed. Various types of load balancing techniques and various parameters are considered in this paper.

KEYWORDS: Mantes; load balancing; static vs; dynamic; centralized; distributed.

I. INTRODUCTION

Load balancing is the ability of a network, to balance the situation when the network is overloaded or under loaded. Wireless networks are heterogeneous in nature nowadays. The services should be provided by the wireless networks are any time-and-anywhere connectivity leads to next generation networks. The dynamic nature of resource utilization of wireless networks is very important for resource sharing. The focus of the research work mainly based on the services of load balancing. Load balancing is one of the basic technologies for heterogeneous wireless networks. This technique improves resource utilization better.

Load balancing depends mainly on network architecture and the algorithms used. The aim of load balancing is to offer the resources to avoid overloading and remain idle. Due to various emerging application requirement, the reliable data transfer and the load balancing techniques are the major key research topics. The main problem of load balancing is the non availability of computing resources. The nodes may be idle some time, under loaded or overloaded due to many reasons. Nodes in the network need high power to finish its work. Since the resources work parallel or multitude which consists of decentralized unit. Optimization algorithms are used to address the load balancing technique traditionally.

For wireless networks, there is no global coordination. The user needs to work independently based on the local management of resources. The user of wireless network does not have global knowledge about the resources used by others in the network. Hence this unawareness of resources by the nodes in the network makes much problem for resource utilization and load balancing. Additionally, the property of quality of service (Qos) should be satisfied in order to do load balance. Load balancing technique uses various types of load balancing approaches. The taxonomy of load balancing is given in Fig1.

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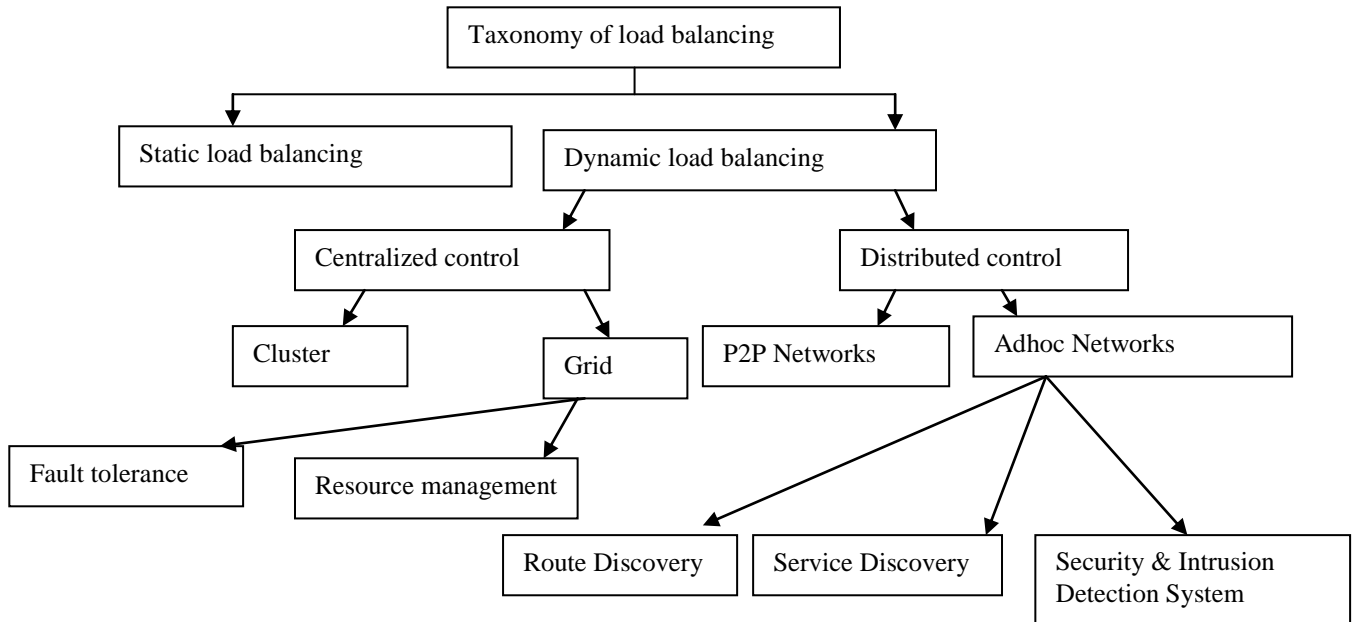


Fig1. Taxonomy of load balancing

1.1 STATIC LOAD BALANCING VS. DYNAMIC LOAD BALANCING

The load balancing techniques are broadly classified into two basic techniques which are Static and Dynamic. In literature many works have been carried out in static load balancing [1]. Optimal static load balancing technique is proposed which uses single job class for bus and star network. Dynamic scheduling strategy is provided which is aware of resource requirement of submitted task. Condor et al [4] developed a technique which provides services for reliability. The diffusion algorithm is used [5] to transfer data at run time. Dynamic load sharing policy[6] is proposed for CPU and memory services. They addressed solution for only dynamic load balancing.

1.2 CENTRALIZED LOAD BALANCING VS. DISTRIBUTED LOAD BALANCING

In centralized technique, a single host maintains the overhead information with lower reliability. Many centralized load balancing techniques have been proposed [7] [8]. Load balancing in distributed environment involves large-scale resource sharing. This type of load balancing involved in the field of grid computing [9] [10]. Bio Map [11] technology offers grid computing which offer accessing data from a certain source database. Further, the partition of a service tasks are made into subtasks and the available resources are accessed from a certain source data.

1.3 P2P LOAD BALANCING VS. ADHOC LOAD BALANCING

Many solutions have been proposed to address the issues in P2P networks [12][13]. A algorithm[14] which balances load in the presence of multiple peers. Mobile adhoc network is a collection of nodes with temporary network without any centralized or fixed infrastructure. These types of network consist of two types of routing protocol which are table driven and on demand. Table driven protocols maintain up-to-date routing information. On demand routing protocol maintains routing information at every host. Many algorithms are used in Adhoc networks such as AODV, DSR and so on.

In distributed approach, each node communicates with every other node in the network. The hosts in communication network are not dependent on centralized control for decision making. In the proposed paper we have used two distributed networks: P2P and Adhoc networks.



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1.4 P2P DISTRIBUTED NETWORKS

P2P networks are improved by considering a subset of existing hosts. A dynamic load balancing technique is developed using dynamic hash table that ensures the hosts to join the systems. Another work is developed to improve the replica of placing distributed file systems. In P2P networks, the problems are handled based on load balancing in the context of content and resource management.

1.5 ADHOC NETWORKS

MANET is a collection of mobile nodes without having any fixed infrastructure. Various routing algorithms are proposed to the load balancing concept in Adhoc networks. The protocols in adhoc networks are generally categorized as table driven and on demand. On the other hand these types of networks have hybrid routing protocol. Cluster based protocols are also available that are emulated with the help of base stations such as wireless cellular networks. The most important protocol in MANET is Dynamic Source Routing (DSR) and Adhoc On demand Distance Vector (AODV) protocol. These protocols are most prominent because they have been submitted to the Internet Engineering Task Force (IETF) work group. Next, the NSR protocol maintains the information about 2-hop neighbourhood of a host. Service discovery is an integral part of MANETs that discovers service location protocol.

II.CONCLUSION

In this paper, we have explored various types of networks that are involved in load balancing. First, we have studied about the difference between static load balancing and dynamic load balancing. In this various types of algorithms proposed for load balancing are discussed. Next, we discussed about centralized load balancing and distributed load balancing techniques. Finally, we discuss about adhoc networks load balancing concepts for MANET. Thus in this paper we have explored various load balancing techniques and taxonomy of load balancing techniques.

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