

Load Balancing in Cloud Computing



Load Balancing In Cloud Computing

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Ravi Kumar**

Load Balancing In Cloud Computing:

Comparative Analysis of Load Balancing Algorithms in Cloud Computing Mohit Tomar, 2017 Abstract Cloud computing is a novel trend emerging in Information Technology IT environments with immense infrastructure and resources. An integral aspect of cloud computing is load balancing. Efficient load balancing in cloud computing ensures effective resource utilization. There are two types of load balancers: the static load balancer and the dynamic load balancer. While both types of load balancers are widely used in the industry, they differ in performance. In this project, the performances of the most widely used static and dynamic load balancers, namely the round robin and the throttled, are compared. Specifically, the project examines whether the throttled algorithm takes less time than the round robin algorithm to access data in cloud computing. The results show that the throttled algorithm takes less time than the round robin algorithm to access data and that this difference is due to a faultiness in the implementation of the round robin algorithm.

Anticipatory Models of Load Balancing in Cloud Computing Shahrzad Aslanzadeh, 2016 *Algorithms for Energy Efficient Load Balancing in Cloud Environments* Norman Peitek, 2014-12-30 Seminar paper from the year 2013 in the subject Computer Science. Commercial Information Technology grade 1.0 Otto von Guericke University Magdeburg Faculty of Computer Science course Recent Topics in Business Informatics language English abstract Energy efficiency has a rising importance throughout society. With the growth of large data centers, the energy consumption becomes centralized and nowadays takes a significant amount of the overall electricity consumption of a country. Load balancing algorithms are able to make an existing infrastructure more efficient without major drawbacks. This structured literature research presents the state of the art technology regarding the load balancing approach to make data centers more energy efficient. The state of the art approaches are reviewed for techniques, improvements, and consideration of performance effects.

Performance Study of Load Balancing Algorithm in Cloud Computing Zhnova Adnan Obaid, 2017 Cloud computing is one of the information technology latest developments that achieved a huge success and it has taken over the technology world. This is due to its ability to provide a broad range of users to access vast amounts of virtualized resources, scalable services, and storage services via using the Internet. Load balancing is an important part of the functionality of cloud computing because of its ability to stabilize the load and provide maximum optimization. Therefore, it comes with no surprise that it requires a lot of attention and study. During the course of many years, vast amounts of load balancing algorithms have been developed while some of them were instant success, some of them were not. It is important to investigate and examine these algorithms to compare, contrast, and to determine which algorithm works with what. This research project is going to study different types of load balancing algorithms such as RR, Random, No load balancer, Max min, Min min, etc. By analyzing the result that is obtained from the simulation from the Riverbed Modeler software to discover and to choose the best ways for resource utilization and an efficient load balancing algorithm.

Evolutionary Approaches for Load Balancing in Cloud Computing Subhadarshini

Mohanty,2022-10-12 Introduction 1 1 Cloud computing at a glance The advancement in Information and communication technology has evolved many computing paradigms 1 2 Cloud computing is a well known technology among them The main backbone of cloud computing is the combination and advancement of system technologies especially hardware internet technologies distributed computing and system management 3 In distributed computing the resources are distributed worldwide

Dynamic Load Balancing in Cloud Computing Platform N. A. Joshi,2020 The cloud computing platform has played significant role behind the exponential growth of modern IT industry More and more organizations individuals from various sectors of society are directory or indirectly consuming cloud computing platform Such rising demand for cloud based computing resources has generated requirement of optimized resource management and load balancing Extensive research work is taking place for efficient resource management and load balancing A dynamic approach for virtual machine load balancing is presented here The load balancing mechanism presented here offers better efficiency due to its multi threaded approach

Comparative Study of Load Balancing Algorithms in Cloud Computing for Wired and Wireless Networks Rasti Qasim Ali,2018 Cloud computing is emerging as a modern paradigm for the purpose of accessing manipulating and configuring large scale distributed applications through the Internet The load on the cloud is evolving with the development of new applications in parallel Load balancing algorithms improve the workload to be distributed equally across all nodes and prevents the situation in which some nodes become overloaded while others have the lowest load at the time when a request is made Performance parameters just like CPU utilization and Processing Delay have been studied in order to achieve a higher user satisfaction and resource allocation ratio and ensures that all computing applications perform the same amount of work in the equal time Load balancing is an ideal solution to evenly distribute the load across all the servers by using different types of load balancing algorithms The deployment of cloud computing raises so many challenge tasks such as resource management request handling in cloud environment and the most important one is how to balance load in cloud computing In this project in order to solve the problem of network congestions some load balancing algorithms have been used with the use of a load balancer in two types of technologies wired and wireless OPNET modeler has been used to examine the used load balancing algorithms for different scenarios Moreover the performance of some parameters has been obtained such as CPU utilization on both load balancer and the servers and the processing delay on the load balancer A deep analysis was conducted to investigate these parameters of performance and well studied comparison is achieved The numerical results proved that using a load balancer decreases the CPU utilization and load on the servers

Novel Practices and Trends in Grid and Cloud Computing Raj, Pethuru,Koteeswaran, S.,2019-06-28 Business and IT organizations are currently embracing new strategically sound concepts in order to be more customer centric competitive and cognitive in their daily operations While useful the various software tools pioneering technologies as well as their unique contributions largely go unused due to the lack of information provided on their special characteristics Novel Practices and

Trends in Grid and Cloud Computing is a collection of innovative research on the key concerns of cloud computing and how they are being addressed as well as the various technologies and tools empowering cloud theory to be participative penetrative pervasive and persuasive While highlighting topics including cyber security smart technology and artificial intelligence this book is ideally designed for students researchers and business managers on the lookout for innovative IT solutions for all the business automation software and improvisations of computational technologies

Load Balancing in Multi-cellular 4G Using Cloud Computing Ravyar Jasim Hamd, 2017 Cloud computing is a technology which enables the sharing of hardware and software resources Service models of the cloud computing are Software as a Service Platform as a service and Infrastructure as a Service Cloud computing is evolving with the system of telecommunication in parallel The integration of mobile and wireless networks with cloud computing will offer ubiquitous services anytime and anywhere to the users However since the number of mobile devices are increasing the demand for services located on servers in the cloud computing will increase too In order to deal with such situation load balancing is a prominent solution to distribute the load equally to the servers through the use of different types of load balancing algorithms In this thesis the system of telecommunication used to be integrated with cloud computing is the LTE or 4G This system is widely deployed and its integration with cloud computing will raise so many challenges one of the most important one is how to load balance the traffic generated in multi cellular LTE on the servers located in the cloud In this thesis some load balancing algorithms were used in order to solve the problem of congestions in the networks though a load balancer In order to investigate the performance of these algorithms Riverbed network simulator is used Some performance parameters were studied such as CPU utilization on the server user equipments and end to end delay to the servers As well as the case of failure of the servers in cloud computing is studied especially its effect on the ongoing applications represented by http application is analyzed

Cloud Computing Bible Barrie Sosinsky, 2010-12-10 The complete reference guide to the hot technology of cloud computing Its potential for lowering IT costs makes cloud computing a major force for both IT vendors and users it is expected to gain momentum rapidly with the launch of Office Web Apps later this year Because cloud computing involves various technologies protocols platforms and infrastructure elements this comprehensive reference is just what you need if you ll be using or implementing cloud computing Cloud computing offers significant cost savings by eliminating upfront expenses for hardware and software its growing popularity is expected to skyrocket when Microsoft introduces Office Web Apps This comprehensive guide helps define what cloud computing is and thoroughly explores the technologies protocols platforms and infrastructure that make it so desirable Covers mobile cloud computing a significant area due to ever increasing cell phone and smartphone use Focuses on the platforms and technologies essential to cloud computing Anyone involved with planning implementing using or maintaining a cloud computing project will rely on the information in Cloud Computing Bible

Cloud Computing, Smart Grid and Innovative Frontiers in Telecommunications Xuyun Zhang, Guanfeng

Liu, Meikang Qiu, Wei Xiang, Tao Huang, 2020-05-22 This book constitutes the refereed proceedings of the 9th International Conference on Cloud Computing CloudComp 2019 and the 4th International Conference on Smart Grid and Innovative Frontiers in Telecommunications SmartGIFT 2019 both held in Beijing China in December 2019 The 55 full papers of both conferences were selected from 113 submissions CloudComp 2019 presents recent advances and experiences in clouds cloud computing and related ecosystems and business support The papers are grouped thematically in tracks on cloud architecture and scheduling cloud based data analytics cloud applications and cloud security and privacy SmartGIFT 2019 focus on all aspects of smart grids and telecommunications broadly understood as the renewable generation and distributed energy resources integration computational intelligence applications information and communication technologies

Computational Intelligence for Green Cloud Computing and Digital Waste Management Kumar, K. Dinesh, Varadarajan, Vijayakumar, Nasser, Nidal, Poluru, Ravi Kumar, 2024-02-27 In the digital age the relentless growth of data centers and cloud computing has given rise to a pressing dilemma The power consumption of these facilities is spiraling out of control emitting massive amounts of carbon dioxide and contributing to the ever increasing threat of global warming Studies show that data centers alone are responsible for nearly eighty million metric tons of CO₂ emissions worldwide and this figure is poised to skyrocket to a staggering 8000 TWh by 2030 unless we revolutionize our approach to computing resource management The root of this problem lies in inefficient resource allocation within cloud environments as service providers often over provision computing resources to avoid Service Level Agreement SLA violations leading to both underutilization of resources and a significant increase in energy consumption Computational Intelligence for Green Cloud Computing and Digital Waste Management stands as a beacon of hope in the face of the environmental and technological challenges we face It introduces the concept of green computing dedicated to creating an eco friendly computing environment The book explores innovative intelligent resource management methods that can significantly reduce the power consumption of data centers From machine learning and deep learning solutions to green virtualization technologies this comprehensive guide explores innovative approaches to address the pressing challenges of green computing Whether you are an educator teaching about green computing an environmentalist seeking sustainability solutions an industry professional navigating the digital landscape a resolute researcher or simply someone intrigued by the intersection of technology and sustainability this book offers an indispensable resource

Load Balancing and Rate Limiting Based Algorithms for Improving Cloud Computing Performance Joseph Doyle, 2012

Cloud Computing Enabled Big-Data Analytics in Wireless Ad-hoc Networks

Sanjoy Das, Ram Shringar Rao, Indrani Das, Vishal Jain, Nanhay Singh, 2022-03-20 This book discusses intelligent computing through the Internet of Things IoT and Big Data in vehicular environments in a single volume It covers important topics such as topology based routing protocols heterogeneous wireless networks security risks software defined vehicular ad hoc networks vehicular delay tolerant networks and energy harvesting for WSNs using rectenna FEATURES Covers applications

of IoT in Vehicular Ad hoc Networks VANETs Discusses use of machine learning and other computing techniques for enhancing performance of networks Explains game theory based vertical handoffs in heterogeneous wireless networks Examines monitoring and surveillance of vehicles through the vehicular sensor network Investigates theoretical approaches on software defined VANET The book is aimed at graduate students and academic researchers in the fields of electrical engineering electronics and communication engineering computer science and engineering **A Novel Approach To**

Enhance The Performance Of Cloud Computing File System Using Load Balancing Algorithm Pradheep

Manisekaran,2015-02-19 Doctoral Thesis Dissertation from the year 2014 in the subject Computer Science IT Security Lovely Professional University Punjab Lovely Professional University Phagwara Punjab course M Tech Information Technology language English abstract Cloud computing is one of the biggest thing in computing in recent time Cloud computing uses the internet and the central remote servers to support different data and applications Cloud computing is that emerging technology which is used for providing various computing and storage services over the Internet In the cloud computing the internet is viewed as a cloud Internet users can receive services from a cloud as if they were employing a super computer which be using cloud computing To storing data in the cloud instead of on their own devices and it making ubiquitous data access possible Load balancing helps to make resource utilization effective and also used to improve the response time of the job The load balancing helps to remove the nodes which are unbalanced In this situation it removes the nodes which are overloaded or under loaded It is dynamic in nature In the cloud computing file system management is the big issue We use round robin algorithm with load balancing in the file systems It will help to enhance the performance of file system It also helps to increase the access of file systems in cloud computing Proceedings of the 3rd International Symposium on Big

Data and Cloud Computing Challenges (ISBCC - 16') V. Vijayakumar,V. Neelananarayanan,2016-02-22 This proceedings volume contains selected papers that were presented in the 3rd International Symposium on Big data and Cloud Computing Challenges 2016 held at VIT University India on March 10 and 11 New research issues challenges and opportunities shaping the future agenda in the field of Big Data and Cloud Computing are identified and presented throughout the book which is intended for researchers scholars students software developers and practitioners working at the forefront in their field This book acts as a platform for exchanging ideas setting questions for discussion and sharing the experience in Big Data and Cloud Computing domain **A Comparison of Select Load Balancing Algorithms in Cloud Computing** Varsha

Thakur,2015 This paper compares the performances of three algorithms with different service broker policies namely Round Robin Equally Spread Current Execution ESCE and Throttled Load Balancing CloudSim and CloudSim based tool are used for simulation The results reveal that Throttled load balancing algorithm with optimistic service broker policy is superior to others However from the cost point of view Round Robin under closest service broker policy is most cost effective due to little migration overheads *Silverlight 4* Nick Lecrenski,2010-04-26 A hands on guide to Microsoft s latest rich application

development technology Silverlight 4 Silverlight 4 is the newest version of the rich Internet application toolkit that provides support for NET capabilities over the Internet With this latest release of Silverlight Microsoft has revolutionized the way that Web applications can be created This book uses the popular Problem Design Solution strategy to demonstrate how to harness the power and abilities of Silverlight 4 to add value to the overall user experience of a Web site Using a Web site created by the author as a reference point you ll go through the steps of creating a live fully functional application for the Web using Silverlight 4 and the Silverlight Control Toolkit Along the way the book addresses important design considerations such as the use of Web Services and the SQL Server database Uses the popular Problem Design Solution format show you how to harness the power of the latest version of Silverlight Microsoft s rich Internet application toolkit Puts the author s own Web site to task as you learn to create rich user interfaces that integrate video HTML and social networking components Explains system linking and data flow end user interface system architecture based on Silverlight 4 and NET 4 and more Includes coverage on integrating social networking and Facebook With this book you ll quickly get started using the new features of Silverlight 4 to enhance the user experience of a Web site Note CD ROM DVD and other supplementary materials are not included as part of eBook file

Quantum Particle Swarm Optimization Technique for Load Balancing in Cloud Computing Elrasheed Ismail Sultan,2013 Cloud Computing systems are widely applied in many fields such as communication data management web application network monitoring financial management and so on The distributed Cloud Computing technology has been produced as the development of the computer network and distributed computing technology Researches on data Cloud Computing become the necessary trend in the distributed Cloud Computing system domain since the sources and application of the data are distributed and the scale of the applications enlarges quickly Load management is the focus of research in both of the area in distributed Cloud Computing systems and centralized Cloud Computing systems Although researches on the load management in the cloud systems is similar to that of traditional parallel and distributed systems in many aspects essential differences exist between them The choice of a scheduling strategy has significant impact on the runtime Central Processing Unit memory consumption as well as the storage systems Load balancing optimization techniques such as Ant Colony Optimization ACO First Come First Served FCFS Round Robin RR and Particle Swarm Optimization PSO are popular techniques being used for scheduling and load balancing However these techniques have its weaknesses in terms of minimizing makespan computation cost and communication cost In this study load balancing technique in Cloud Computing called Quantum Particle Swarm Optimization QPSO technique proposed by considering only minimization of makespan computation cost and communication cost Performance of the QPSO technique based on many heuristic algorithms it is comprised the following steps Firstly tasks are assigned averagely to the machines according to a special initialization policy Then the optimal criterion for exchanging tasks between two machines is proposed and exploited to speed up the improving process towards load balance Secondly this thesis proposes job combination based

static algorithm for load balancing where all jobs should be organized into the standard job combinations each task of which consists of one to four jobs. Then they are assigned to the machines according to the assignment algorithm for job combinations which is a special integer partition algorithm. Finally, the result of the experiment shows that QPSO can achieve at least three times cost saving as compared with ACO, FCFS, RR, and PSO.

Application Delivery and Load Balancing in Microsoft Azure Derek DeJonghe, Arlan Nugara, 2020-12-04

With more and more companies moving on-premises applications to the cloud, software and cloud solution architects alike are busy investigating ways to improve load balancing performance, security, and high availability for workloads. This practical book describes Microsoft Azure's load balancing options and explains how NGINX can contribute to a comprehensive solution. Cloud architects Derek DeJonghe and Arlan Nugara take you through the steps necessary to design a practical solution for your network. Software developers and technical managers will learn how these technologies have a direct impact on application development and architecture. While the examples are specific to Azure, these load balancing concepts and implementations also apply to cloud providers such as AWS, Google Cloud, DigitalOcean, and IBM Cloud. Understand application delivery and load balancing and why they're important. Explore Azure's managed load balancing options. Learn how to run NGINX OSS and NGINX Plus on Azure. Examine similarities and complementing features between Azure managed solutions and NGINX. Use Azure Front Door to define, manage, and monitor global routing for your web traffic. Monitor application performance using Azure and NGINX tools and plug-ins. Explore security choices using NGINX and Azure Firewall solutions.

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Load Balancing In Cloud Computing Introduction

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