

Integration of Databases with Cloud Enviornment

Anuradha Gayake, Prof.R.L.Paikrao

Abstract—“Cloud computing” mainly concern, shared or distributed computing, networking, virtualization, software and web services. Cloud contains clients, datacenter and distributed servers. It is on-demand service in which shared resources, information, software as well as other resources are provided to clients when they demand or request for it. To provide remote service and resources to the client, a cloud is the solution is required. Most of the enterprise applications are migrated to the cloud. To serve multiple clients simultaneously cloud level scalability is required. To-

day, load balancing and auto scaling is the important aspect in cloud computing. To provide a service to client to migrate data from their local servers to cloud is important aspect. We have studied various cloud services and migration policies in this paper.

Index Terms - Virtual Machine, CloudSim, Datacenter, VM Load Balancer, Round Robin Virtual Machine Load Balancing Algorithms.



1 INTRODUCTION

With increasing success in migrating enterprise applications to cloud environments also increases the stress to integrate enterprise applications both on-premises and services in the clouds with other distributed services on clouds. For integrating enterprise applications in the cloud with the other distributed services on clouds CEAI is the cloud enterprise application integration that bridges gap between services of cloud

and on-premises software. CEAI have properties such as, multi-tenancy, cloud-level scalability and environmental heterogeneity. These properties help for distinguishing applications that are cloud-based from traditional Enterprise Application Integration (EAI) environments [1]. Enterprise Service Bus (ESB) [2] , is the important components in service-oriented middleware [3]. By building on ESB on the EAI side and SOI on the

cloud side, cloud Service Bus (CSB) supports the CEAI properties and also bridges the gap between services of cloud and on-premises software.

Cloud offers organizations to scale their resources, whenever they expect it as necessary. Multiple clients can request for resources as they need. Though cloud has scalability itself, in existed system, user has to wait for long time to gain the response from server. Some systems that are

implemented with FCFS, Least-Connection, and Least Loaded algorithms are not much efficient in terms of time management and hence they are resulting into less CPU utilization.

Round robin algorithm for load balancing is an active algorithm for scheduling task [14]. With RR-algorithm Load balancer allocates a VM to requesting node in cyclic manner equally to all available nodes. RR algorithm simply maintains a

queue of incoming requests and allocates them VM in Time scheduling manner. Each request is executed for specific time slice [15]. From analysis of RR algorithm, resource utilization and job response time is improved in the load distribution problem on various nodes of a distributed system [13].

Round robin algorithm works on time sharing approach rather than priority or in linear way like, FCFS

algorithm.

2 LITERATURE SURVEY

Jianwei Yin, Xingjian Lu, Calton Pu, Zhaohui Wu, Hanwei Chen [1], mainly focused on cloud services in SAAS model. For integrating enterprise applications in the cloud with the other distributed services on clouds CEAI is the cloud enterprise application integration

that bridges gap between services of cloud and on-premises software. CEAI have properties such as, multi-tenancy, cloud-level scalability and environmental heterogeneity. These properties help for distinguishing applications that are cloud-based from traditional Enterprise Application Integration (EAI) environments. Cloud Service Bus (CSB) used to support the properties of CEAI and it also helps to bridge the gap between

services of cloud and on-premises software. Basically, this system implements JTangCSB, for integration of an efficient as well as cost effective service to gain CEAI. Evaluation of JTangCSB represents an effectiveness and feasibility of CSB approach.

Strauch, Steve, et al[2] and Vaquero, Luis M, et al. [3], focus on enabling multi-tenancy for one of the important components in service-oriented middleware, i.e. Enterprise Service

Bus (ESB). Authors discussed about the prototype realization of a multi-tenant aware ESB by using an open source solution. Vaquero, Luis M, et al represents the scalability of application in cloud environments. For managing applications in a holistic manner that includes LB approaches for cloud applications, they provide state of the art technologies. They also deal with NaaS and discussed about the challenges and plat-

form scalability arises in cloud in next generation.

Georgantas, Nikolaos, et al[4][5], introduced system integration solution that is based on orchestration workflow and a high-level data-driven coordination abstraction. It enables application workflows that are agnostic to the underlying middle-ware platforms. Orchestration workflow preserves native CM's difficulties with integrating heterogeneous systems. The proposed

CS, PS, TS, and further GDS abstractions as well as related trade-off is between generic programming interfaces that offers simplicity and outperforms the loss of platform-specific features. Proposed Model-based solution involves design time mapping which tends to small runtime overheads. Model-based approach is used to extend SOA & ESB infrastructure that supporting the development of complex applications inte-

gration of heterogeneous services.

Shen, Zhiming, et al[6], describes CloudScale system. This system automates fine grained elastic resource scaling in multi-tenant cloud computing infrastructures. CloudScale system consist of three key components such as, combining online resource demand prediction and efficient prediction error handling to meet application SLOs with minimum resource cost, supporting multi-VM concur-

rent scaling with conflict prediction and predicted migration to resolve scaling conflicts with minimum SLO impact and integrating VM resource scaling with dynamic voltage and frequency scaling (DVFS) to save energy without affecting application SLOs. This system is implemented in Xen virtualization platform. Experimental results are conducted with the help of RUBiS benchmark driven by real Web server traces, Hadoop MapReduce

systems.

Ni, Jiakai, et al [7] and Pippal S K, Kushwaha D S.[8], studied the problem of adaptive multi-tenant database schema design. In this they identified important attributes, as well as common attributes, star attributes and dependent attributes. Using important attributes they build several dense base tables. Further they evaluate the importance of attributes using Page Rank algorithm. Author Pippal S

K, Kushwaha D S. implements the Multi-tenant database for an ad hoc cloud as it is fit to verify SaaS cloud services delivered between multiple clients. Ad hoc cloud derives the data as well as services from fixed cloud then they are connected using ad-hoc link. Multi-tenancy has three approaches namely, Separate database, shared database and Shared database, shared schema.

Nusrat Pasha, Dr. Amit Agarwal and Dr. Ravi

Rastogi [9], introduced VM Load balancing algorithm called as, "Round Robin Load Balancing Algorithm". This algorithm helps to handle service request from user base. Load Balancing is a way to distribute workload on the different computers or a computer cluster via network links. It achieves optimal resource utilization for maximizing throughput and minimizing overall response time. Load balancing helps to avoid too much

overload on the resources and dividing the traffic between servers and data.

Round Robin Load Balancer is the simplest way of scheduling that utilizes time quantum or time slices. Throttled Load Balancer (TLB) provides guarantee of pre-defined number of cloudlets are allocated to a single VM at any given time. Whereas, Active Monitoring Load Balancer (AMLB) maintains, status of each VM's. In this paper authors proposes

Round Robin VM Load Balancing algorithm to maintain two data structures such as, Hash Map and VM State List. Different numbers of virtual machines are analyzed with the help of Round Robin VM Load Balancing algorithm.

Amandeep Kaur Sidhu , Supriya Kinger[10] and Prof.Meenakshi Sharma, Pankaj Sharma[11] ,represents an issues regarding to cloud computing. Load balancing is the well problem; it can be clas-

sified into three categories as, Centralized approach: in this a single node is responsible for managing the distribution within the whole system. Distributed approach: in this, each node individually builds its own load vector by collecting the load information of other nodes. And these two approaches are combined into mixed approach. Authors Prof.Meenakshi Sharma, Pankaj Sharma study of various virtual machine load balancing

algorithms in cloud computing. They proposed VM load balancing algorithm that is implemented in CloudSim. For allocation to the new request, proposed algorithm finds the expected response time of each resource (VM) and sends the ID of virtual machine having minimum response time to the data center controller.

Pooja Samal, Pranati Mishra[12]and Ajay Gulati , Ranjeev.K.Chopra[13],

studies effect of Round robin technique with dynamic approach by alternating the vital parameters of host such as, bandwidth, cloudlet long length, VM image size and VM bandwidth. By analyzing RR algorithm resource utilization and job response time is improved in the load distribution problem on various nodes of a distributed system. In this approach overloading and under loading situations are avoided. RR algorithm shows

better response time as compared to the other algorithms hence LB ensures that all the processor in the system or every node in the network does approximately the equal amount of work at any instant of time.

Randles, M Lamb and Taleb Bendiab[14], discussed various load balancing schemes. They described that static load balancing scheme provide easiest simulation as well as monitoring of environment. But it is fail to

model heterogeneous nature of cloud. Whereas, dynamic load balancing algorithm are difficult to simulate, but it is best suited in heterogeneous environment of cloud computing. Round robin algorithm is a distributed nature of algorithm provides better fault tolerance. It requires higher degree of replication.

Stuti Dave and Prashant Maheta[15], utilizes the concept of round robin algorithm for load balancing.

With RR-algorithm Load balancer allocates a VM to requesting node in cyclic manner equally to all available nodes. RR algorithm simply maintains a queue of incoming requests and allocates them VM in Time scheduling manner. Each request is executed for specific time slice. It is an active monitoring algorithm; therefore request processing is faster when round robin is used with load balancing in cloud computing. They

proved that, round robin algorithm is faster processing algorithm on incoming cloud requests that resulting in faster load balancing. It only keeps in mind that, request size and the effect of number of rounds of algorithm.

3 CONCLUSION

In this paper we review some papers that are related load balancing as well as utilization of

round robin algorithm for load balancing in cloud computing. Along with round robin algorithm incoming requests are sequentially distributed across the server. This is a method for allocating server on a continuous looping fashion. As compared to other algorithms such as, Least-Connection, and Least Loaded algorithm round robin algorithm has more CPU utilization. We also did the study of three CEAI properties such as,

multi-tenancy, cloud-level scalability and environmental heterogeneity that are used to distinguished cloud based applications from EAI environments. An evaluation of JTangCSB is feasible and effective for CSB approach. According to literature survey we can conclude that there is need of such system that works timely-efficient for handling outsourcing of data in cloud computing.

REFERENCES

- [1] Jianwei Yin, Xingjian Lu, Calton Pu, Zhao-hui Wu, Hanwei Chen, "JTangCSB: A Cloud Service Bus for Cloud and Enterprise Application Integration"
- [2] Strauch, Steve, et al. "Implementation and Evaluation of a Multi-tenant Open-Source ESB," ESOCC 2013, pp. 79-93.
- [3] Vaquero, Luis M, et al. "Dynamically scaling applications in the

- cloud," ACM SIGCOMM Computer Communication Review, 2011, 41(1): 45-52.
- [4] Georgantas, Nikolaos, et al. "A coordination middleware for orchestrating heterogeneous distributed systems," Advances in Grid and Pervasive Computing 2011, pp. 221-232.
- [5] Georgantas, Nikolaos, et al. "Service-oriented Distributed Applications in the Future Internet: The Case for Interaction Paradigm Interoperability," ESOC 2013, pp. 134-148.
- [6] Shen, Zhiming, et al. "Cloudscale: elastic resource scaling for multi-tenant cloud systems," Proceedings of the 2nd ACM Symposium on Cloud Computing. ACM, 2011.
- [7] Ni, Jiakai, et al. "Adapt: adaptive database schema design for multi-tenant applications," Proceedings of the 21st ACM interna-

- tional conference on Information and knowledge management. ACM, 2012.
- [8] Pippal S K, Kushwaha D S. "A simple, adaptable and efficient heterogeneous multi-tenant database architecture for ad hoc cloud," Journal of Cloud Computing, 2013, 2(1): 1-14.
- [9] Nusrat Pasha, Dr. Amit Agarwal and Dr. Ravi Rastogi," Round Robin Approach for VM Load Balancing Algorithm in Cloud Computing Environment".
- [10] Amandeep Kaur Sidhu1, Supriya King-er," Analysis of Load Balancing Techniques in Cloud Computing"
- [11] Prof.Meenakshi Sharma,CSE Department SSCET Badhani ,Pankaj Sharma," Performance Evaluation of Adaptive Virtual Machine Load Balancing Algorithm".
- [12] Pooja Samal, Pranati

- Mishra," Analysis of variants in Round Robin Algorithms for load balancing in Cloud Computing".
- [13] Ajay Gulati¹, Ranjeev.K.Chopra²," Dynamic Round Robin for Load Balancing in a Cloud Computing".
- [14] Mayanka Katyal, Atul Mishra," A Comparative Study of Load Balancing Algorithms in Cloud Computing Environment".
- [15] Stuti Dave,B H Gardi College of Engineering and Prashant Maheta," Utilizing Round Robin Concept for Load Balancing Algorithm at Virtual Machine Level in Cloud Environment".