International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249-8958 (Online), Volume-8 Issue-5, June 2019

Data Migration and Replication Issues in Cloud Computing

R. V.S.S.S.Nagini, B.M.G. Prasad

Abstract---Cloud service providers have more reputation for data storage service and offering unlimited storage, data availability, better scalability due to this benefits so many clients are motivated to store their data in cloud storage. But cloud service providers always can't guarantee the quality of service or may be violating the SLAs due to this data migration is required so cache as service can overcome migration issues. Cache is a significant part of any client-server application due to its advantages can reduce the delayed access of any form and provide conventional latency and fast response time to reach the growing mass of users. Implementing a Cache-as-a-Service across the data centres will allow multiple data centres to access managed in-memory cache instead of a direct datacenter.

Keywords--- CSP, SLA, Migration, Replication

I.INTRODUCTION

Cloud computing is a highly scalable and Internet-based computing environment in which, the computing sources afforded in the form of services. Customers have to pay according to the service usage. We can make broad classification of cloud from deployment models and services offered by it.

The NIST's definition of cloud computing states that, "Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can rapidly provisioned and released with minimal management effort or service provider interaction". As per the deployment model, a cloud can term as Private Cloud, Public Cloud or Hybrid Cloud. From services, a cloud can classify as IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (Software as a Service). Another interesting definition of cloud computing is, "Cloud computing refers to both the applications delivered as services over the Internet and the hardware and system software in the data centres that provide those services."

Migration is the process of moving the resource of one platform into another platform, and these different types among few are application migration, database migration, cloud migration, system migration, digital migration and data migration. Data migration moves or transfer data between data storage systems. Cloud services become facilitated accelerated provisioning make public of server advantages (CPU, storage, and bandwidth) to clients everywhere. To utilize variety of utility expenses to produce service vicinity to patrons within diverse geographic fields, a cloud service frequently spans several data centers over the globe, e.g., Amazon CloudFront, Microsoft Azure, and Google App Engine. The flexible and on-demand nature of support provisioning has given cloud winning to providers of multiple applications. Many new forms are being created on the cloud platform, while many current forms are also viewing the cloud-ward move, including content sharing applications.

Cloud computing providing many services to users through the internet among all services storage as a service one using this service any organization or client can place his data to the cloud and access anywhere and anytime but due its availability and scalability the user motivated to create replica in many data centres, this replication process will bring some issues like data availability and latency. If any service level agreement (SLA) violations done then the user can migrate his data to another CSP, but this migration process is cost-effective, replica creation usually needs to relocate and create a large number of data copies over data centres a significant overhead regarding network load and availability. In recent years, certain difficulties associated with duplicating control in dispersed cloud storage studied. A substantial section of investigation efforts was essentially assigned to replica position difficulty, examining differing objects such while reducing storage costs, gaining fault-tolerance and access delays. However, replica position practices may succeed in considerable abundance of data replicas originated or emigrated over time among and within data centers, acquiring massive quantities of traffic within data centers.

II.LITERATURE REVIEW:

Zhitao Wan; et al. [9] Extensive cloud computing ownership dramatically enhances cloud migration requirements for complex local on-premise enterprise applications. The initial search validates the opportunity to combine various consolidated migration services presented by multiple vendors in general to handle cloud migration. The model-based service product was created as an attractive entry to drive service delivery and ensure excellence in the service-oriented architecture region and can implement in the migration support work.

Manuscript published on 30 June 2019.
***** Correspondence Author (s)
R. V.S.S.S.Nagini*, Research scholar, Shri Jagdishprasad Jhabarmal Tibrewala University, Jhunjhunu, Rajasthan.
Dr B.M.G. Prasad, Professor, Dept of CSE and Dean PG Courses at Holy Mary Institute of Technology and Science Hyderabad, Telangana

In the cloud. Also, the most common model production methods are not suitable for cloud migration due to the need for information about the cloud industry migration process or existing performance logs.

Sara Saadat & Hamid Reza Shahriari [6] despite all the advantages that the cloud environment offers to the efforts, there is still a growing need for a conservation policy that can reach the security and insurance companies. Furthermore, the crucial source of an effective cloud-based travel plan is the production of explicitly described processes that continuously monitor challenges and can reflect technological changes and imperatives in the cloud ecosystem. The main project of our structure, in particular, the negotiation of implementation of the plan, is to investigate consumer companies, characterize them regarding trust and generate a business development and maintenance plan.

Stefan Kolb; et al. [7] subsequently, cloud device integration is expected to continue to grow steadily, and a growing number of organizations are moving the application to the cloud. An early drift is the selection of Platform as a Service to promote rapid deployment of usage. With the implementation of managed conditions, cloud programs require a complex organizational effort to develop scalable applications. However, usage migrations to and from clouds are costly to improve and trigger new risks of vendor blocking. The debatable because many movements may need for the convenient and rapidly changing business cloud.

Christian Wagner; et al. [4] A considerable level of knowledge retention in operations and essential IT support must protect during the migration of their IT cooperation to the cloud. Frequently, various authoritative and security pressures must meet following the standard usage guidelines and global models for the execution of the migration. To keep key service providers essential in migrating their services to the cloud, it has initiated a process-based migration guideline for strict support providers that focus on the preservation of knowledge.

Al Kovalick [1] Cloud selection is improving at an annual rate of 23%. Revenue from software applications as a service will reach $ 257 billion in 2020. The technical and operational benefits are compelling and exploited by global mechanisms. Something seems to be that cloud capacity migration requires. Which fruits at fingertips can we migrate now? What are the compromises? The author has discovered a small tutorial on cloud basics with suggestions on migration. The characteristics of the architecture, the delivery of the use, the finance, the open practices and the services analyzed.

Charafeddine El Houssaini; et al. [3] Considering that cloud services are growing exponentially, browsing, filtering, choosing, and ultimately migrating to the service involved involve the conversion of a demanding profession. The author has introduced, several service model companies are intended to distribute with the classification of services, topology and even portability, although the desert to maintain the combination of consumer interests and the control of migration probabilities before the determination planning. To bridge the gap, the author presents a three-part cloud service model with dedicated migration. Besides, a theory of weight is related to service parameters to enhance attention.

Alifah Aida Lope Abdul Rahman & Shareeful Islam [2] the author has presented, a strategy geared toward sustainability aims to measure the profitability of cloud migration. The determination of cloud migration based on the dimensions of sustainability, i.e. commercial, environmental, social and technological, and the opportunities associated with these dimensions. It uses the process of logical hierarchy and fuzzy scale to prioritize dimensions of sustainability according to migration circumstances to calculate the total sustainability index. It is used to solve the feasibility of cloud migration in three different systems, which are convincing, conservative and worthless.

Umar Mukhtar Ismail; et al. [8] the belief in security in cloud computing is one of the most significant obstacles to broader cloud adoption. Potential cloud computing customers want to know if the cloud ecosystem authorities can adequately maintain the crucial resources migrated to the cloud. It also introduces a cloud security declaration step that allows users to estimate the contributions of cloud service providers before migration while monitoring the underlying issues of the movement. The strategy involves a set of ideas such as character, objectives, monitoring, circumstances, testimony, and the certainty of maintaining safety control exercises. These theories have been studied as a vocabulary to represent the properties needed to verify cloud protection before and after migration.

J. Hwang; et al. [5] with the hope of low-cost access to soft and flexible estimates, companies often migrate their real workloads to cloud computing conditions. Nevertheless, the heterogeneity and complexity of traditional IT foundations make it necessary to simplify migration methods towards an industrial equilibrium. The author presents Cloud Migration Orchestrator, a framework for self-regulation and coordination of large-scale cloud migration, based on IBM's business process management technology with pre-migration analysis.

Zhengong Cai; et al. [10] To promote the migration of software applications to the cloud ecosystem, cloud providers have introduced different methodologies and guidelines for migration. Most of them require personal intervention, including the manual task of performing regular duties. The author proposes a model-based transmutation strategy for the migration of employment in the cloud. The procedure automatically adjusts the application's baseline code before the movement to make it cloud-ready and then converts the authorization code to the destination code in the cloud ecosystem.

III.PROBLEM STATEMENT

A cloud service provider (CSP) offering storage as a service to avail this benefit and to avoid local data storage maintenance now a day's many organizations are migrating to cloud, while selecting a single cloud service provider for data storage limits availability and scalability and maybe it also causes a vendor lock.

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication (BEIESP)

So if organizations are relying on separate cloud service provider causes above limitations. To avoid scalability issues and data availability the storage data must be replicated into data, and if any csp is violated SLA or flexibility the storage data must be migrated to another CSP, But this process is cost effective. So two task is involved in this process replicate and data migrate to the cloud storage, and another job is a selection of optimal CSP to serve volatile requests with service response time guarantee at all times, while minimum operational cost.

While data replicating between data centres following issues have occurred.

1. Copying vast bulk of data from source datacenters to destination datacenters consumes resources like CPU, memory, I/O cost, while this replication going other task running on datacenter may decrease the performance.
2. While creating replica due to an exchange of bulk of data may overload the network, this can decrease the overall network performance.
3. Data is unavailable while data copying from a source data centre to destination datacenter

While migrating data from one CSP to another CSP following issues have occurred.

1. Directly we can't migrate from CSP to another CSP datacenter why because each CSP contains own constraints.
2. For this, the client required another source to take data from existing CSP and store into temporary data centre from this he can move data to the new CSP this process is cost effective and time-consuming.
3. Until migrating data from one CSP to another CSP, data is unavailable.

So many service providers are offering data as a storage service, due to this selection of appropriate CSP among all CSPs is a tedious task, whether the selected CSP will guarantee the service quality is a significant challenge.

IV.RESULT AND DISCUSSION

The fictive company web page is FCloud.com. It is a customer-facing web application of company F**,** and it serves as a marketing portal and a customer management system. Consumers, partners and employees use the web application to work together with each other using a rich web interface that can be viewed in any standard internet browser. In FCloud.com is available the list of the complete catalog of products and their details. When some new product is announced it can happen that the traffic loud can increase resulting in periodic spikes. When the traffic is normal the FCloud.com experiences a fairly steady and practicable traffic load. This traffic load is high on weekdays and low on weekends. Currently the website is hosted on dedicated infrastructure at the company's headquarters.

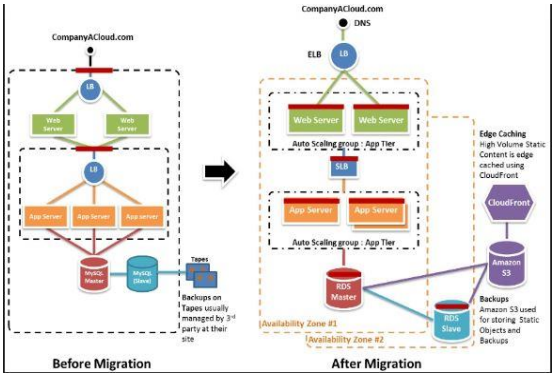

Fig 1: Fcloud.com Architecutre (Before and After Migration)

V.CONCLUSION

In this paper describes problems of data replication and migration in cloud computing, due to SLA volitions data migrations is required but while this data is temporarily unavailable, and this process needed more computation resource and cost, to avoid these issues while replication or migrations the user should aware or estimate the trustworthiness of and risk of particular cloud service provider. To available data while data migration and replication cache as a service recommended.

REFERENCES

1. Al Kovalick, 2013, "The Facility Designer's Guide to Cloud Migration", ISSN: 1545-0279, Volume: 122, Issue: 7, PP: 46-50.
2. Alifah Aida Lope Abdul Rahman & Shareeful Islam, 2015, "Sustainability forecast for cloud migration", ISSN: 2326-6910, 2015 IEEE 9th International Symposium on the Maintenance and Evolution of Service-Oriented and Cloud-Based Environments (MESOCA), PP: 31-35.
3. Charafeddine El Houssaini; Mahmoud Nassar; Abdelaziz Kriouile, 2015, "A cloud service template for enabling accurate cloud adoption and migration", 2015 International Conference on Cloud Technologies and Applications (CloudTech), PP: 1-6.
4. Christian Wagner; Aleksandar Hudic; Silia Maksuti; Markus Tauber; Frank Pallas, 2015, "Impact of Critical Infrastructure Requirements on Service Migration Guidelines to the Cloud", 2015 3rd International Conference on Future Internet of Things and Cloud, PP: 1-8.
5. J. Hwang; K. Bai; M. Tacci; M. Vukovic; N. Anerousis, 2016, "Automation and orchestration framework for large-scale enterprise cloud migration", ISSN: 0018-8646, Volume: 60, Issue: 2-3, PP: 1:1 - 1:12.
6. Sara Saadat & Hamid Reza Shahriari, 2014, "Towards a process-oriented framework for improving trust and security in migration to cloud", 2014 11th International ISC Conference on Information Security and Cryptology, PP: 220-225.
7. Stefan Kolb; Jörg Lenhard; Guido Wirtz, 2015, "Application Migration Effort in the Cloud - The Case of Cloud Platforms", ISSN: 2159-6182, 2015 IEEE 8th International Conference on Cloud Computing, PP: 41-48.
8. Umar Mukhtar Ismail; Shareeful Islam; Haralambos Mouratidis, 2015, "Cloud Security Audit for Migration and Continuous Monitoring", 2015 IEEE Trustcom/BigDataSE/ISPA, PP: 1081-1087.
9. Zhitao Wan; Fan Jing Meng; Jing Min Xu; Ping Wang, 2014, "Service Composition Pattern Generation for Cloud Migration: A Graph Similarity Analysis Approach", 2014 IEEE International Conference on Web Services, PP: 321-328.
10. Zhengong Cai; Liping Zhao; Xinyu Wang; Xiaohu Yang; Juntao Qin; Keting Yin, 2015, "A Pattern-Based Code Transformation Approach for Cloud Application Migration", ISSN: 2159-6182, PP: 2015 IEEE 8th International Conference on Cloud Computing, PP: 33-40.

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication (BEIESP)

AUTHOR PROFILE

R.V.S.S.S.Nagini is Research scholar in JJT University and working as assistant professor in CMR Institute of Technology, Medchal, Hyderabad. Currently, she has 8 years of experience in teaching, and interested areas are cloud computing, Data Mining, Machine Learning and Artificial Intelligence.

Dr. B.M.G. Prasad presently serving as Professor in Computer Science and engineering and Dean PG Courses at Holy Mary Institute of Technology and Science, Hyderabad, Telangana. Prevously, he worked as Principal in Dr K.V.Subha Reddy College Engineering for Women, Kurnool, A.P. He is having 18+ years of teaching experience in various Engineering College. He has done his B.E. at Vijaya Nagar Engineering College, Bellary in July 1997. He completed his M. Tech at J.N.T.U College of Engineering, Anatapur in January 2003. He Completed his Ph.D in Computer Science and engineering from CMJ University, Meghalaya State in February 2013. He has published papers in the I-Manager's International Journal and Indian National Science Congress, Tiruvananthapuram in the Computer Networks area. He has published 15 international Journals and five national Journals and Conferences. He authored two Text books in adhoc networks and Map Reduce. His areas of interest are Software Engineering, Cloud Computing, Wireless Networks, Imag Processing etc.

Published By:
Blue Eyes Intelligence Engineering
& Sciences Publication (BEIESP)