ISSN (Print) : 0974-6846
Indian Journal of Science and Technology, *Vol 8(32), DOI: 10.17485/ijst/2015/v8i32/87496 , November 2015* ISSN (Online) : 0974-5645

Cloud Services for Efficient Log Management

J. Shiny Duela[1] and K. Sivaraman[2*]

[1]Department of Computer Science and Engineering, Jerusalem College of Engineering, Chennai - 600100, Tamil Nadu, India; shiny.duela@gmail.com

[2]Department of Computer Science Engineering, Bharath University, Chennai - 600073, Tamil Nadu, India; sivaraman.cse@bharathuniv.ac.in.

Abstract

In the web server, we can find much net traffic, insecurity over the application and also lack of performance measures for the application. Here the time consumption is more for searching the log and, risk of data loss if a server crashes and the fact that data are distributed across multiple servers, storage and processing are outsourced to third party providers and this could result in delays in responding to user requests or other problems that raise concern. So by using software as a service (SaaS) and platform as a service (PaaS) in the cloud, we are enhancing the visualization and performances of application over internet, and then deploying the overall application in the cloud to manage the log details and database storage. In this application, the user can be authenticated by their username and password during sign in. The logs can be managed based on the user activity and can be viewed only by the administrator. The admin activity also can be viewed separately in the admin logs. Thus the cloud itself allows multiple users to visit our site at a time without any net traffic and, if the server crashes, then there is no loss of data which has been stored in the database.

Keywords: Cloud, Log, PaaS, SaaS

1. Introduction

Cloud computing is is typically defined as a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications. In cloud computing, the word cloud (also phrased as "the cloud") is used as a metaphor for "the Internet," so the phrase cloud computing means "a type of Internet-based computing," where different services — such as servers, storage and applications — are delivered to an organization's computers and devices through the Internet. Cloud computing is comparable to grid computing, a type of computing where unused processing cycles of all computers in a network are harnesses to solve problems too intensive for any stand-alone machine. To enhance the visualisation and performances of application over internet by using cloud services and to promote the application in cloud by improvising their strategies using log management system. In a web server, the user can find many net traffics and insecurity over the application. To overcome this, the newly developing cloud environment is used. Software as a Service (SaaS) and Platform as a Service (PaaS) is used to provide software and platform by itself[1]. For setting up the cloud services, the Google appengine is used through eclipse IDE. The application is deployed in the cloud for managing the log details and database storage by using the Google appengine.

2. Related Works

Shinichi Nakahara, Hidetaka Ishimoto[14], this paper clearly explains about the log data for multiple services supported by non-local servers, and trace cloud-based services focusing on prevailing web based cloud services. Here they have primarily concerned with the Software as a Service (SaaS) cloud offerings provided as application services. Log data is critically important for analyzing and replicating events that occur in cloud-based systems. After all, it is log data that enables troubleshooting, fault diagnosis, operating audits, performance monitoring,

* *Author for correspondence*

resource robustness monitoring, detection and protection against intrusions and host of other uses. Finally they had concluded that Platform as a Service (PaaS) is clearly an important functional element for supporting multiple services on the cloud.

H. Gilbert Miller and John Veiga[3], this paper clearly explains about the basics and challenges of the cloud computing environment. Here they have described the top layer applications delivered on demand in the Software as a Service (SaaS), middleware providing applications services as a Platform as a Service (PaaS) and the flexible Infrastructure as a Service for distributed data centre services connected via Internet style networks. Cloud computing faces many of the same challenges as other information and network technologies like performance, security, resiliency, interoperability, data migration and transition from legacy systems. Yahoo mail, Google apps, salesforce.com, WebEx, and Microsoft Office Live are all cloud service "products".

R. Palson Kennedy, T.V. Gopal[5], this paper clearly explains about the basic value proposition of cloud computing is that by leasing applications online, companies have the potential to significantly reduce their operating costs. Here they had clearly explained about the four deployment models and three delivery models. They had used the IaaS as the bottom layer of the protocol stack, middle layer as the PaaS and the top layer of the protocol stack is SaaS. Cloud computing has a significant advantage over traditional enterprise software yet is fraught with risks. The intent of this analysis has been to present the fundamentals of cloud computing, how they are changing quickly into public, private, hybrid clouds and the implications on organizations over time.

Sherif Sakr, Anna Liu, Daniel M.Batista[1], this paper gives a comprehensive survey of numerous approaches and mechanisms of deploying data applications in the cloud. They had explained the essential characteristics of the cloud computing as On Demand Self-Service, Rapid Elasticity, Resource Pooling, Broad Network Access, and Measured Service. The main aspects of cloud computing are Virtualization, Grid Computing, Utility Computing, Autonomic computing. The main goals of the cloud data management systems are Availability, Elasticity, Multitenancy, Scalability, Performance, Load and Tenant Balancing, Fault tolerance, Ability to run in a heterogeneous environment, Flexible Query Interface and the challenges are Availability of a Service, Data Confidentiality, Data Lock-In, Data Transfer Bottlenecks, Application Parallelization, Shared Nothing Architecture, Performance Unpredictability, Application Debugging in Large-Scale Distributed Systems. The main advantages of cloud computing are reduced time-to-market, reduced cost, reduced operational cost and unlimited throughput.

Debora A. Frincke, Richard Ford[8], this paper clearly explains about the delivery models and the deployment models of the cloud. For many Records and Information Management (RIM) professionals, cloud computing resembles a traditional hosting service: Information storage or applications are outsourced to a third-party provider and accessed by the organization through a network. Cloud computing is the ability to access a pool of computing resources owned and maintained by a third party via the internet. It is a new way of delivering technology through the computing resources based on long existing technologies such as server virtualization. Cloud computing usually involves the transfer, storage, and processing of information on the provider's infrastructure, which is outside the consumer's control. Here they had explained in detail about the three delivery models and four deployment models of the cloud computing. The main disadvantages of cloud computing in RIM is compliance and e-discovery, integrity and confidentiality, service availability and reliability, service portability and interoperability, information retrieval and destruction, and loss of governance, integration, and management.

3. Log Management Requirements

The challenges around cloud-based log management include some of the challenges generally facing log management. Log management itself is an indistinct term, it's defined as a service to collect, stabilize, store and search log data. Defining functional capabilities represent a lot of complexity and value to the organization if implemented accurately[2]. However, if implemented apprehensively, log management can introduce large risk and liabilities by centralizing huge amounts of thin-skinned trade clandestine, user credentials, customer accounts and/or synchronized personal data.

4. Cloud-based Log Management

Now that we have a simple description of log management

and understand the factors that complicate it, let's consider how these change when moving to a cloud computing provider[3]. Our first functional capability was the collection of data from disparate log sources. That task must still happen and is essentially unchanged when moving to the cloud, except for an increased importance of encryption during transport. Just as with a COTS vendor, you must still know your major log sources and verify that the vendor's products support them[4].

The second factor, normalization, is also unchanged: The cloud service must properly normalize the data if you want to be able to gain the most value out of your logs[5]. It is critical, with both COTS and cloud-based offerings, to verify that the data within the supported products is actually normalized properly.

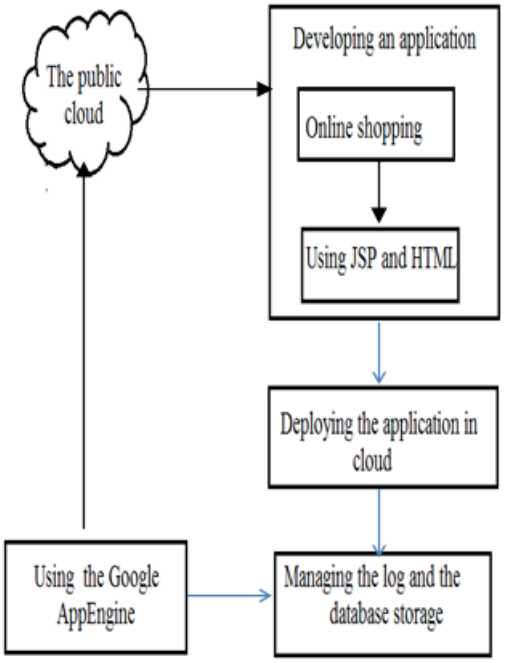

Figure 1. System architecture.

The third functional factor, storage, is an area where the cloud solutions differ from the in-house COTS solutions[10]. When designing the in-house solution, you must ensure you have adequate hardware in terms of processing power, storage capacity and storage speed[11]. The compression level of the log management software is important for estimating the disk capacity you'll need to support your data retention requirements[12]. With cloud-based solutions, those concerns are essentially removed; your service charge is probably based on the data volume and/or the number of devices sending data, but you don't need to plan, implement and support that hardware. Not only does the cloud-based solution remove that responsibility from you, but it also removes the up-front capital expenditures, replacing them with ongoing operational expenses that typically work better from a budgeting perspective[13].

The security of sensitive data at rest, even when on servers in a secure facility you operate, is always a consideration[6]. A server can be hacked into and the data extracted, a server admin (with legitimate authorized access) can copy or tamper with the data, or any other number of issues (accidental or intentional) can cause that data to be exposed[7]. Encryption of that data at the application and disk level, preferably such that server administrators do not have the ability to decrypt, can substantially reduce that exposure risk. When the data moves to the cloud, those controls are beyond your ability to enact and verify. You need to determine how, if at all, the cloud computing provider secures the data and prevents it from being tampered with or accidentally intermingled with that of another cloud customer[8]. When asked about data security, vendors often will focus on encryption of the data in-transit and the security of the data center(s) where the servers are housed. Neither of these controls will make it more difficult for an attacker who has compromised one or more servers to obtain your data.

Another complicating factor for cloud-based log management is the production of large amounts of historical data[9]. If, for example, you must produce three months' worth of log data from 10 servers, will you be able to do so? How will the vendor produce and provide it to you? Imagine a scenario where your company needs to provide log data for litigation purposes -- will you be able to? This is less important if the log management service is not intended to be the record of retention, as you'd be able to collect the data from the various individual sources.

5. Cloud Service Framework

By using Platform as a Service (PaaS), we are developing, deploying, maintaining, and updating our application[5]. Platform as a Service (PaaS) solutions are development platforms for which the development tool itself is hosted in the cloud and allows accessing the applications through a browser[14]. The Google AppEngine acts as a platform for creating and hosting the applications into the cloud[15]. By using the Software as a Service (SaaS), the

hosted applications are made available to the customers over a network, typically the internet[16]. Log management is the collection, storage, and reporting of log data from applications.

6. Results and Discussions

The performance of the proposed system is evaluated based on the following four criteria's:

- Developing the application.
- Creating the cloud environment.
- Deploying the application in cloud
- Managing the log and database storage.

In the existing system, we can find much net traffic, insecurity over the application and also lack of performance measures for the application[17]. Here the time consumption is more for searching the log and, risk of data loss if a server crashes and the fact that data are distributed across multiple servers, storage and processing are outsourced to third party providers and this could result in delays in responding to user requests or other problems that raise concern[18].

In the proposed system, by using Software as a Service (SaaS) and Platform as a Service (PaaS) in the cloud, we are enhancing the visualization and performances of application over internet, based on online shopping and then deploying the overall application in the cloud to manage the log details and database storage[19]. In this application, the user can be authenticated by their username and password during sign in. The logs can be managed based on the user activity and can be viewed only by the administrator. The admin activity also can be viewed separately in the admin logs.

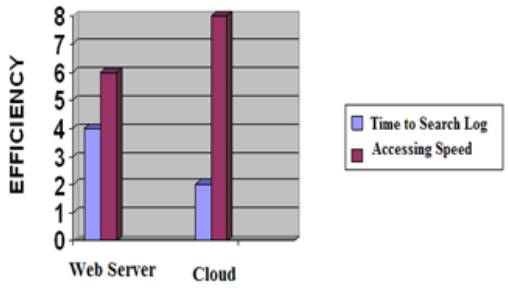

Figure 2. Performance measures.

7. Conclusion and Future Work

Thus we have used the Platform as a Service (PaaS) for developing the application and hosting in the cloud environment. And the deployed application is accessed by the users as a Software as a Service (SaaS). The log details stored in the AppEngine helps the admin to view the amount of resource allocation and the user activities such as "when the customer has logged into his account or when he has accessed the application, who has accessed, what the customer has did, and how they have used the application". Also we are managing the database which updates, stores and helps in retrieving the user details. Additional security can be given to the application using some encryption algorithms such as Public key Cryptosystems, SHA algorithm, X.509. The application can be enhanced with the additional features like discount prices and more products.

8. References

1. Kimio T, Natarajan G, Hideki A, Taichi K, Nanao K. **H**igher involvement of subtelomere regions for chromosome rearrangements in leukemia and lymphoma and in irradiated leukemic cell line. Indian Journal of Science and Technology. 2012 Apr; 5(1):1801–11.
2. Cunningham CH. A laboratory guide in virology. 6th ed. Minnesota: Burgess Publication Company; 1973.
3. Sathishkumar E, Varatharajan M. Microbiology of Indian desert. In: Sen DN, editor. Ecology and Vegetation of Indian Desert. India: Agro Botanical Publishers; 1990. p. 83–105.
4. Varatharajan M, Rao BS, Anjaria KB, Unny VKP, Thyagarajan S. Radiotoxicity of sulfur-35. Proceedings of 10th NSRP; India. 1993. p. 257–8
5. 01 Jan 2015. Available from: http://www.indjst.org/index.php/vision
6. Sakr S, Liu A, Batista DM. A survey of large scale data management approaches in cloud environment. Communications Surveys and Tutorials. 2011; 13(3):311–36.
7. Udayakumar R, Khanaa V, Kaliyamurthie KP. Optical ring architecture performance evaluation using ordinary receiver. Indian Journal of Science and Technology. 2013; 6(S6):4742–7. ISSN: 0974-6846.
8. Miller HG, Veiga J. Cloud computing: Will commodity services benefit users long term. IT Professional. 2009; 11(6):57–9.
9. Uma Mageswaran S, Guna Sekhar NO. Reactive power contribution of multiple STATCOM using particle swarm optimization. International Journal of Engineering and Technology. 2013; 5(1):122–6. ISSN: 1793-8236.
10. Kennedy RP, Gopal TV. Assessing the risks and opportunities of cloud computing-defining identity management and maturity model. Trendz in Information Sciences and Computing; Chennai. 2010 Dec 17-19. p. 138–42. ,

11. Udayakumar R, Khanaa V, Saravanan T, Chromatic dispersion compensation in optical fiber communication system and its simulation. Indian Journal of Science and Technology. 2013; 6(S6):4762–6. ISSN: 0974-6846.
12. Chen Y, Wang W, Gao M. Application of distributed safe log management in small-scale, high-risk system. International Conference on Innovations in Information Technology (IIT 09); Al Ain. 2009 Dec 15-17. p. 26–9
13. Debora A. Frincke, Richard Ford. Cloud computing: A records and information management perspective. Security and Privacy. 2011; 9(6):63–6.
14. Vidyalakshmi K, Kamalakannan P, Viswanathan S, Ramaswamy S. Antinociceptive effect of certain dihydroxy flavones in mice. Pharmacology Biochemistry and Behavior. 2010; 96(1):1–6. ISSN: 0091-3057.
15. Lawton G. Developing software online with platform as a service technology. 2008 Jun; 41(6):13–5.
16. Available from: http://www.pointsource.com/expertise/pdfs/cloudpdf/CloudComputingArch-090529.pdf
17. Vijayaragavan SP, Karthik B, Kiran Kumar TVU, Sundar Raj M. Analysis of chaotic DC-DC converter using wavelet transform. Middle-East Journal of Scientific Research. 2013; 16(12):1813–9. ISSN: B27.
18. Cloud computing architect. Available from: http://cloudcomputingarchitect.com/
19. Available from: http://cloudtweaks.com
20. Available from: http://support.cloudfoundry.com/entries/20024591-architecture-description
21. Available from: http://computer.howstuffworks.com/cloudcomputing/cloudcomputing1.htm
22. Available from: http://www.techno-pulse.com/
23. Available from: www.ibm.com/developerworks/websphere/zones/hipods/
24. Nahakara S, Ishimoto H. A study on the requirements of accountable cloud services and log management. 8th Asia-Pacific Symposium on Information and Telecommunication Technologies (APSITT); Kuching. 2010 Jun 15-18. p. 1–6.