International Journal of Computer and Communication Technology

Volume 3 | Issue 3 Article 10

July 2012

IMPROVING ACCESSIBILITY OF MOBILE CLOUD COMPUTING USING MULTIDIMENSIONAL DATA STRUCTURE

RINKU V. RAJANKAR
Computer Science & Engineering, G.H. Raisoni College of Engineering, (G.H.R.C.E.), Nagpur, India,
rinkurajankar@gmail.com

R. W. JASUTKAR
Computer Science & Engineering, G.H. Raisoni College of Engineering, (G.H.R.C.E.), Nagpur, India,
r_jasutkar@yahoo.com

IMPROVING ACCESSIBILITY OF MOBILE CLOUD COMPUTING USING MULTIDIMENSIONAL DATA STRUCTURE

RINKU V. RAJANKAR & R.W. JASUTKAR

Computer Science & Engineering, G.H. Raisoni College of Engineering, (G.H.R.C.E.), Nagpur, India
E-mail : rinkurajankar@gmail.com, r_jasutkar@yahoo.com

Abstract - Mobile cloud computing provides a solution to meet the increasing functionality demands of end-users, as all application logic is executed on distant servers and only user interface functionalities reside on the mobile device. As a result there is increasing demand of online personal data storage which should be used anywhere to provide a high performance, easy to use universal data access service thru various computing resources. In this paper we introduce multi-dimensional data structure to improve the accessibility of cloud .In the developing process of various servers proposed work make use of Microsoft's latest windows Azure cloud computing platform.

Keywords - *Cloud Computing, Azure framework.*

I. INTRODUCTION

Cloud computing [1] is one of the emerging technologies that will lead to the next generation of Internet. It provides optimized and efficient computing through enhanced collaboration, agility, scalability, and availability that reduces hardware and software investment cost. The essential cloud characteristics are on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service. Computing capabilities, such as server time and network storage, can be unilaterally provisioned or de-provisioned as needed automatically. They are available over the Internet and accessible through heterogeneous client platforms, such as laptops and mobile phones. The computing resources are pooled and dynamically assigned and reassigned to serve multiple consumers. The capabilities appear to be unlimited, as they can be rapidly and elastically provisioned to quickly scale out and rapidly released to quickly scale in.

So Cloud computing is a paradigm in which data, applications or software are accessed over a network. This network of servers is called as "Cloud". A cloud application leverages the cloud in software architecture, often eliminating the need to install and run the application on the customer's own computer, thus alleviating the burden of software maintenance, ongoing operation, and support. Commercial cloud computing has three distinct offerings.

Software as a service (SaaS): SaaS delivers a single application through the browser to thousands of customers using a multitenant architecture. On the customer side, it means no upfront investment in servers or software licensing; on the provider side, with just one application to maintain, costs are low compared to conventional hosting.

Infrastructure as a Service (IaaS): IaaS is the delivery of computer infrastructure (typically a platform virtualization environment) as a service. Raw infrastructure, such as servers and storage, is provided from the vendor premises directly as an on-demand service.

Platform as a service (PaaS): Development platforms and middleware systems hosted by the vendor, allowing developers to simplify code and deploy without directly interacting with underlying infrastructure. That means it is possible to build own applications that run on the provider's infrastructure and are delivered to users via the Internet from the provider's servers.

The remainder of the paper is organized as follows, in section II we present key technology of cloud computing. In section III we reported related work and finally conclusion in section IV .

II. KEY TECHNIQUES OF CLOUD COMPUTING

In this section, we would take Google's cloud computing techniques [2] as an example, summed up some key techniques, such as data storage technology (Google File System), data management technology (BigTable).

A. Google File System (GFS)

Google File System (GFS)[3] is a proprietary distributed file system developed by Google Inc. for its own use. It is designed to provide efficient, reliable access to data using large clusters of commodity hardware. GFS is optimized for Google's core data storage and usage needs (primarily the search engine), which can generate enormous amounts of data that needs to be retained. Files are divided into chunks of 64 megabytes, which are only extremely rarely overwritten, or shrunk; files are usually appended to or read. It is also designed and optimized to run on Google's computing clusters, the nodes of which consist of cheap, "commodity" computers, which means precautions must be taken against the high failure rate of individual nodes and the subsequent data loss. Other design decisions

select for high data throughputs, even when it comes at the cost of latency.

The nodes are divided into two types: one Master node and a large number of Chunkservers. Chunkservers store the data files, with each individual file broken up into fixed size chunks (hence the name) of about 64 megabytes, similar to clusters or sectors in regular file systems. The Master server doesn't usually store the actual chunks, but rather all the metadata associated with the chunks, such as the tables mapping the 64-bit labels to chunk locations and the files they make up, the locations of the copies of the chunks, what processes are reading or writing to a particular chunk, or taking a "snapshot" of the chunk pursuant to replicating it (usually at the instigation of the Master server, when, due to node failures, the number of copies of a chunk has fallen beneath the set number). All this metadata is kept current by the Master server periodically receiving updates from each chunk server ("Heart-beat messages").

B. BigTable

A Bigtable[4] is a sparse, distributed, persistent multidimensional sorted map. The map is indexed by a row key, column key, and a timestamp; each value in the map is an uninterpreted array of bytes. BigTable is now used by a number of Google applications, such as MapReduce, which is often used for generating and modifying data stored in BigTable, Google Reader, Google Maps, Google Book Search, "My Search History", Google Earth, Blogger.com, Google Code hosting, Orkut, YouTube, and Gmail. Google's reasons for developing its own database include scalability, and better control of performance characteristics.

III. RELATED WORK

The aim of this paper is to combine cloud computing technologies with multidimensional data structure so that cooperating organizations can share vast amounts of data with improved accessibility. Recently an increasing number of commercial cloud platform has established to offer flexible services for end user around world. Amazon simple storage services (S3)[5] aim to provide storage as a low-cost ,highly available service via an HTTP-like interface. Generic operations such as get, put, delete and list are supported so that other services can be developed based on S3.

A. Microsoft Azure Platform

The Microsoft Azure Platform [6] is a cloud computing platform that offers a set of cloud computing services similar to the Amazon Web Services. Windows Azure Compute allows the users to lease Windows virtual machine instances. Azure compute follows a platform as a service approach and offer the net runtime as the platform. Users can deploy their programs as an Azure development package through a web application. Platform-as-a-service infrastructures have a greater capability to offer quality of service and automated management services than infrastructure-as-a-service offerings. Azure offers a limited set of instances on a linear price and feature scale.

B. Virtualization

Resource virtualization is at the heart of most cloud architectures. The concept of Virtualization allows an abstract, logical view on the physical resources and includes servers, data stores, networks, and software. The basic idea is to pool physical resources and manage them as a whole. Individual requests can then be served as required from these resource pools. For example, it is possible to dynamically generate a certain platform for a specific application at the very moment when it is needed. Instead of a real machine, a virtual machine is used. Proposed work create virtual cloud environment by using Azure Framework.

C. Web Application

The Web Application is the only interface provided system to the user to access the cloud infrastructure. We provide different functions based on the permissions assigned to a user. Our system is based on the client-server[7] approach. The client tools provide files and directories operations for users except for the management of users. It takes care of the registration of users and communities. It is designed to present users a friendly interface to simplify the management of users and communities.

D. Data access service.

In the windows Azure platform, a platform called Windows Azure Storage is specifically designed to build file storage service. Windows Azure Storage allows programmers to store any data they want. In accordance with "cloud computing" concept, the data once stored in the "cloud" will never be lost, programmers can gain access to any size of data at any time, from any terminal, anywhere. Different types of data storage available on windows azure are

- Blob storage: It is for long-term data. Blobs are binary objects together with <name, value> pair metadata. Each blob can be up to 50 GB and blobs are grouped into logical containers. Blobs are replicated three times in the data center for reliability purposes and they can be accessed from any server or by a URL over the Internet.
- Table storage: Another type of persistent storage. A table can be very large (millions of rows and columns) and is partitioned by rows and distributed over the storage nodes in Windows Azure. It is also triply replicated. Tables are not full SQL tables because there is no join operator..

- Queue: Asynchronous messaging service.

Table storage is used in proposed module as it work with multi-dimensional data structure

IV. CONCLUSION

Now, mobile computing user are looking for more effective ways to store and access their large amount of personal data. In our proposed system is providing more flexibility to access the data using multi-dimensional data structure. Also that data may not be precise .In future proposed system may include fuzzy concept to improve accessibility.

REFERENCES

[1] Irena Bojanova & Augustine Samba "Analysis of cloud computing delivery arch. Model". 2011 Workshops of International Conference on Advanced Information Networking and Applications

[2] Xu Wang, Beizhan Wang & Jing Huang ."Cloud computing and its key techniques". 2011 IEEE

[3] Ghemawat S, Gobioff H, Leung ST, "The Google file system' In:Proc. Of the 19th ACM Symp. On Operating Principles. New York: ACM Press. 2003. 29-43.

[4] Chang F, Dean J, Ghemawat S, Hsieh WC, Wallach DA, Burrows M, Chandra T, Fikes A, Gruber RE. "Bigtable: A distributed storage system for structure data" In:Proc. Of the 7th USENIX Syrup. On Operating Systems Design and Implementations. Berkeley: USENIX Association, 2006. 205-218.

[5] Keith R. Jackson, Lavanya Ramakrishnan &Krishna Muriki "Performance Analysis of High Performance Computing Applications on the Amazon Web Services Cloud" 2nd IEEE International Conference on Cloud Computing Technology and Science

[6] Wei Lu, Jared Jackson, Jaliya Ekanayake,et al "Performing Large Science Experiments on Azure: Pitfalls and Solutions" 2nd IEEE International Conference on Cloud Computing Technology and Science

[7] Gwan- Hwan Hwang**. "**Supporting Cloud Computing in Thin- client/server Computing model " 2010 IEEE Internationa Symposium on Parallel and Distributed Processing with Applications