Monitoring and Propagation of Alert Information in Cloud

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Abstract: **Most of the current disaster recovery techniques take time to find the failure of the server and assign an alternative or have to wait for that server to recover. In order to reduce the service time and allow uninterrupted services, in this paper the timer is used to check the status of the main server and WCF service is used to propagate alert to the virtual servers where the physical server data will be replicated. This allows virtual server to take the role of physical server and provide services to the users.**

Keywords: WCF service, Replication

1. INTRODUCTION

Cloud computing is the latest name for the emerging technology around since the mid-90s as "on-demand infrastructure". In 2000's, the automated computing became closer to what is called as "Cloud" today. From 2012 through today, for cloud computing to "cross the chasm" and attract a wider audience beyond develops and start-ups it needs to be easier, more saleable and more flexible – while being billed in a true utility model. Cloud computing 2.0 providers are offering services that are truer to the definition of cloud than ever before.

Each year, a number of natural disasters strike across the globe, killing hundreds and causing billions of dollars in property and infrastructure damage. Extreme weather events have been predicted by climate scientists and have been attributed to global warming. As number of such events increases, minimizing the impact of disasters becomes imperative in today's society. In order to overcome data loss due to disasters where in the servers get corrupted and in turn delay in giving services to the users, data backup has to be done also uninterrupted services have to be provided to the users without delay.

In the proposed approach, data is replicated in virtual servers located in different locations which act as the main server on failure of main server. And for the virtual servers to get the failure information ping command is sent to the main server for every few seconds and if the WCF service does not receive response to that command then the alert is propagated by WCF service.

2. RELATED WORK

Yoshihiro Nakajima et al. [1] designed and implemented a virtualized ICT resource management system called Management Engine. This ME with a virtualized ICT information model expresses the relationship and mapping between physical and virtual resources for carrier network services.

Manish Pokharel et al. [2] proposed cloud-based disaster recovery plan and achieved high availability, high survivability and low unavailability and low downtime with very less cost.

Katarina Grolinger et al. [3] proposed Disaster-CDM, Knowledge as a Service framework for disaster data management which stores huge amount of data while maintaining high availability using NoSQL database and various cloud solutions. Search of disaster data, interoperability, and integration were facilitated through knowledge acquisition and knowledge delivery which applies language processing, information extraction, and retrieval techniques that adds structure and metadata to largely unstructured disaster data. Knowledge delivery services integrate information from different databases and deliver knowledge to consumers. Disaster-CDM is still at the design stage, and only a part of the simulation model data acquisition process is included in the work.

Vijaykumar Javaraiah proposed a backup of data at consumer premises. With minimal cost over and above the cloud services, consumers can have peace of mind. Any solution without backup is not complete. Business continuity and disaster recovery is very much essential for any business. The lack of backup in cloud computing solutions must be plugged and with this solution, the negative impact on business can be avoided. This simple solution should address online backup, disaster recovery and also eliminate the dependency on cloud service providers.

Zhang Jian-hua and Zhang Nan [5] proposed the transformation of domestic ISP new requires including content integration, cross boundary storage, magnanimity, and centralized storage. Business diversification focused on the needs of storage shared, and especially several terminal expansions were dependent on storage. For businesses with limited resources, cloud storage appears to be a good solution.

Jianxin Li et al. [6] iROW is designed to solve some performance penalties on snapshot key operations and I/O operations. iROW uses bitmap to replace the high-cost multi-level index tree structure, which is commonly used in existing solutions; iROW combines redirect-on-write with copy-on-demand; iROWgives the disk space allocation

function back to the host machine's file system. These measures have enhanced both snapshot key operations performance and I/O performance of iROW. In addition, because of the host machine's file system supports sparse file, iROW also achieve that the VM disk image gradually increases with the actual disk usage.

Manish Pokharelet, et al [7] proposed the reliable approach in recovering from disaster where the cloud computing is used as a tool in managing the disaster in the system of organization and is analyzed using Markov model.

Timothy Wood, et al., [8] DR operational assumptions and system model are considered to recover an application to the point of crash.

Kashif Munir, et al., [9] Proposed a cloud security model with security framework which identifies the security challenges in cloud computing.

Shaftab Ahmed., et al [10] Data archiving and storage model are used which focuses on the information security issues while migrating to a cloud environment through which the confidence of end user can be gained partially with the use of cryptographic techniques.

3. PROPOSED SYSTEM

The proposed system aims at securing the data from data loss and providing uninterrupted services to the users in case of disaster.

In the proposed scheme, the user registers with the cloud service provider and access main server for storing and retrieving of the data from the cloud server. As shown in Figure 1, when the user stores the data, that data is replicated to the virtual servers located in different locations. To check the status of the main server, WCF service sends ping command to the main server every second and the main server responds to the ping command. When the main server doesn't respond to the ping command, the WCF service will send an alert to the virtual server.

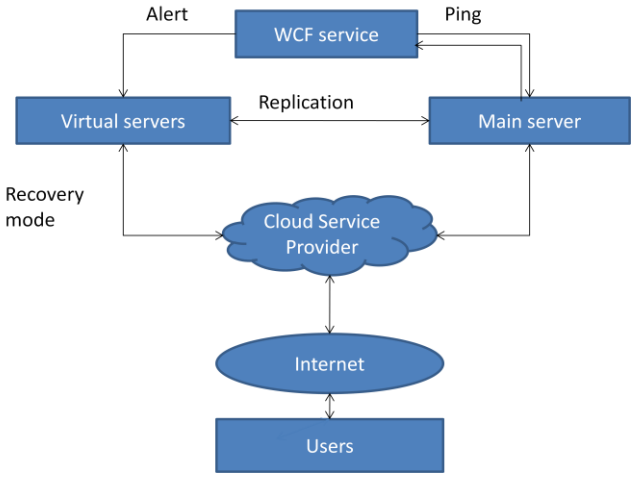
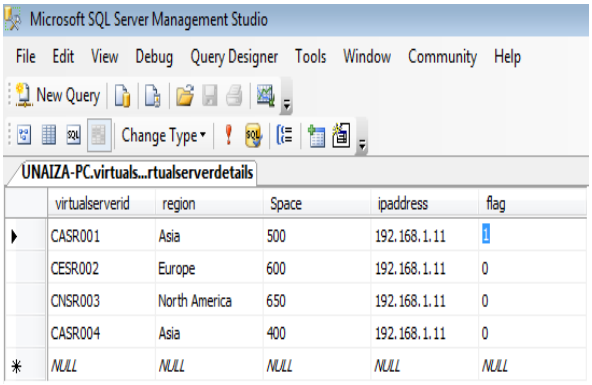


Figure 1: Monitoring and Alert propagation during disaster in Cloud Computing

On receiving an alert from the WCF, the virtual servers communicate with each other and the virtual server with the highest available space acts as the main server and provides services to the users.

To reduce the delay in giving service to the users and prevent data loss in case of a disaster, replication of the data, user details, login details are replicated to the virtual servers for service in case of the failure of main server.

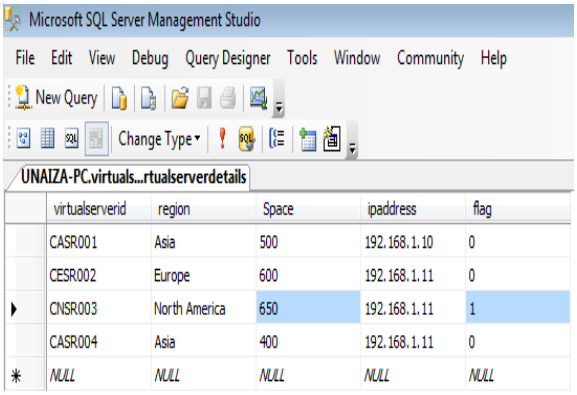
In figure 2, main server i.e. Asia as shown above is up and providing service to the users in normal conditions.



virtualserverid	region	Space	ipaddress	flag
CASR001	Asia	500	192.168.1.11	1
CESR002	Europe	600	192.168.1.11	0
CNSR003	North America	650	192.168.1.11	0
CASR004	Asia	400	192.168.1.11	0
NULL	NULL	NULL	NULL	NULL

Figure 2: Main server (Asia) is up and running (i.e., flag=1)

In figure 3, the main server is down and the virtual server located in North America is up and acting the role of main



virtualserverid	region	Space	ipaddress	flag
CASR001	Asia	500	192.168.1.10	0
CESR002	Europe	600	192.168.1.11	0
CNSR003	North America	650	192.168.1.11	1
CASR004	Asia	400	192.168.1.11	0
NULL	NULL	NULL	NULL	NULL

Figure 3: Main server is down and the virtual server located in North America is up and running which is selected based on the maximum available space (i.e., flag=1)

Server and providing service to the users which is selected based on the large available space which is as shown above.

4. CONCLUSION AND FUTURE WORK

This paper has proposed the concept of monitoring and propagation of alert during cloud disaster by which uninterrupted services to the users can be provided even in the case of a disaster. Ping command is used to check the status of the main server and WCF service is used to propagate the alert to the virtual server in case of failure. The virtual server with more available space will play the role of main server which is decided by the communication

between the virtual servers. Future work will include the replication of data to the main server and to the other virtual servers once the main server is up and ready to provide services to the requests.

REFERENCES

[1] Yoshihiro Nakajima, Hitoshi Masutani, Wenyu Shen, Hiroyuki Tanaka, Osamu Kamatani, Katsuhiro Shimano, Masaki Fukui, and Ryutaro Kawamura, "Design and Implementation Of Virtualized ICT Resource Management System for Carrier Network Services Toward Cloud Computing Era" in ITU Kaleidoscope Academic Conference, 2013.

[2] Manish Pokharel, Seulki Lee and Jong Sou Park, "Disaster Recovery for System Architecture using Cloud Computing", 10th Annual International Symposium on Applications and the Internet, 2010.

[3] Katarina Grolinger, Miriam A.M. Capretz, Emna Mezghani, Ernesto Exposito, "Knowledge as a Service Framework for Disaster Data Management", in Workshops on Enabling Technologies: Infrastructure for Collaborative Enterprises, 2013.

[4] Vijaykumar Javaraiah, "Backup for Cloud and Disaster Recovery for Consumers and SMBs", Brocade Communications, 2011

[5] Zhang Jian-hua and Zhang Nan, "Cloud Computing-based Data Storage and Disaster Recovery", International Conference on Future Computer Science and Education, 2011.

[6] Jianxin L, Hanqing Liu, Lei Cui, Bo Li, Tianyu Wo, "iROW: An Efficient Live Snapshot System for Virtual Machine Disk", in IEEE 18th International Conference on Parallel and Distributed Systems, 2012.

[7] Manish Pokharel, Seulki Lee, Jong Sou Park, "Disaster Recovery for System Architecture using Cloud Computing", in 10th Annual International Symposium on Applications and the Internet, 2010.

[8] Timothy Wood, H. Andrés Lagar-Cavilla, K.K. Ramakrishnan, "PipeCloud: Using Causality to Overcome Speed-of-Light Delays in Cloud-Based Disaster Recovery", University of Massachusetts, 2013

[9] Kashif Munir, Dr. Sellapan Palaniappan, "Framework for secure cloud computing", in International Journal on Cloud Computing: Services and Architecture (IJCCSA),Vol.3, No.2, April 2013.

[10] Shaftab Ahmed, M. Yasin Akhtar Raja, "Tackling Cloud Security Issues and Forensics Model", in IEEE, 2010.