



Review on Relevant Issues with the cloud Storage in Business and Commerce

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Abstract: This paper purposes a general idea about the relevant issues with cloud storage while serving this next generation online virtual storage technology. Cloud storage is a novel storage service mode which the service providers supply storage capacities and data storage services through the internet to clients, meanwhile the clients need not know the details of structures and mechanism. Through this paper author is forwarding issues related to availability, security and legislation need to be clear before trying to convince us to move critical data to the cloud.

Keywords: Cloud storage, virtual storage, novel storage, security, legislation, and critical data.

I. Introduction

Cloud storage is a model of networked online storage where data is stored in virtualized pools of storage which are generally hosted by third parties. Modern day cloud storage is based on highly virtualized infrastructure and has the same characteristics as cloud computing in terms of agility, scalability, elasticity and multi-tenancy [1].

Cloud Storage is part of a wider definition called Cloud Computing which, according to the National Institute of Standards and Technology is “a model for enabling convenient, on demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction” [2].

Cloud Storage system is a corporation storage service system with multiple devices, many application domain. The development of cloud storage system is benefit from broadband network, Web 2.0, storage virtualization, storage network, application storage integrated with services and storage devices, cluster technology, grid computing, distributed file system, content delivery network, per-to-peer, data compression, data encryption, etc [3].

II. Related Technology

There are many cloud computing and cloud storage providers, such as IBM, Google, Sun Microsystems, Microsoft, Amazon, EMC, NetApp, HP, HDS, Symantec, etc. The following listed Cloud Storage Resources are [10]:

A. Cloud Disaster Recovery and Storage Backup:

The Cloud Backup and Recovery topic section offers resources and best practices for data storage professionals who are mapping a disaster recovery strategy using cloud storage and cloud services. Get the latest news and tips on cloud disaster recovery, and find out how cloud storage impacts restore times, business continuity and the organization of sensitive data.



Figure 1 Cloud computing related Technology

B. Cloud Management

The Cloud Storage Management and Standards topic section offers comprehensive resources for data storage professionals looking for information on cloud storage management and cloud standards. Find out how to properly manage your data in the cloud and read our expert advice and guidance on cloud management. Get the latest news and tips on cloud storage strategies and what steps to take for better data management in the cloud. Read our essential guides, special reports and tutorials to keep up with the latest trends in cloud storage management, and see what tips and improvements you can apply to your own management strategy.

C. Hybrid Cloud

The Hybrid Cloud Storage topic section offers comprehensive resources for data storage professionals looking for information on hybrid storage clouds. Learn about the pros and cons of hybrid cloud storage and read our expert advice and guidance on hybrid clouds. Get the latest news and tips on using a hybrid cloud model in your environment and what types of environments are suited for hybrid storage clouds.

D. Private Cloud

The Private Cloud Storage topic section offers comprehensive resources for data storage professionals looking for information on private clouds. Learn about the pros and cons of private cloud storage and read our expert advice and guidance on private cloud infrastructure. Get the latest news and tips on private cloud providers, private cloud services, plus implementation tips, costs and private cloud management advice.

E. Public Cloud:

The Public Cloud Storage topic section offers comprehensive resources for data storage professionals looking for information on public clouds. Learn about the pros and cons of public cloud storage and read our expert advice and guidance on public clouds. Get the latest news and tips on public cloud services, public cloud providers, plus costs, implementation tips and common problems storage managers run into when using public clouds. Learn about the best practices regarding public clouds. Read our essential guides, special reports and tutorials to catch up on the most recent developments in the public cloud storage space, and see what tips and improvements you can apply to your own public cloud.

III. Cloud Storage Architecture

There are many numbers of cloud storage architecture mechanisms are available as per the different cloud storage service platform. They are usually complex and incompatible. Here I am reviewing a layered and generalized architecture of cloud storage. Cloud storage is a service type based on cloud computing.

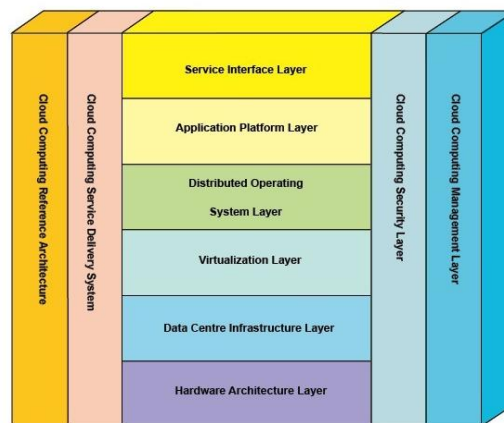


Figure 2 Cloud Computing Architecture

Cloud storage is composed of thousands of storage devices clustered by network, distributed file systems and other storage middleware to provide cloud storage service for users. The architecture from bottom to upper is network and storage infrastructure, storage management, metadata management, storage overlay, service interface. In network and storage infrastructure, there are distributed wired and wireless networks, storage devices networks. In storage management, geographical distributed storage resources are organized by domains and logical entities, data can be stored by files or blocks in storage media.

The metadata management clusters the global domain data storage metadata information and collaborate different domains to load balance. In storage overlay layer, the virtualization and service retrieving and

redirection can be fulfilled. It may be thought as middleware which links storage devices distributed to a virtual storage networks and expose simplified and standard data structures to service interfaces.

In service interface layer, the cloud storage system provides clients uniform interface to access, and filter the illegal clients out of the system. Service delivering mode is a key aspect in cloud storage. Storage resources can be thought as commerce products, and there are much commerce theories and experiences can be lead to cloud storage services [3].

IV. Security and Privacy in Cloud

One of the core themes of cloud computing and cloud storage in general is that service should be independent of the location. [4] Some of these aspects affect the way the cloud service provider creates his service and might lead to security and privacy issues for the consumer of the services. Some of the characteristics of the infrastructure are detailed as follows [5].

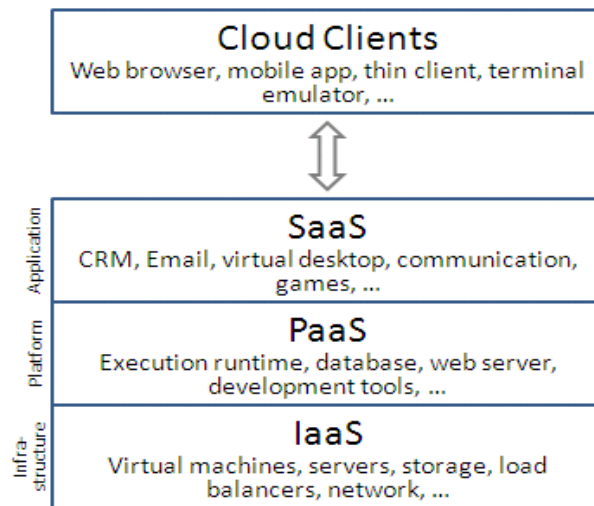


Figure 3 Cloud Computing Layers

A. Location Independent Services

The very characteristics of the cloud computing services is the ability to provide services to their clients irrespective of the location of the provider, the physical hardware below could be moved anywhere but the services should still be available. This feature also applies to the consumers of the services, with the advent of mobile computing platform the consumption of the services cannot be restricted to a particular location but may be requested from any location as per the choices of the customer.

B. Communications

Due to the very nature of the cloud computing infrastructure communications is a major component in every design. These communication lines could exist from few seconds to hours based on the services being consumed. So the security of this communication lines should be persistent as long as the connection between the provider and consumer exists at minimum and cover some buffer period too.

C. Infrastructure

The infrastructure that is used for these services should be secured appropriately to avoid any potential security threats and should cover the life time of component. This lifetime can be estimated to be about 10 years.

D. Storage Security

The data that is stored on the cloud services often would last longer than the security that should be ensured of the components which are used to store or compute these data. This would entail the storage services should be robust enough to achieve component and hardware changes easily and transparently. This applies to the algorithms and encryptions schemes that are used to secure this data; they could become obsolete and might become easy targets to brute force attacks as the processing powers of the various devices keep increasing.

E. Backup Storage

In this aspect the security should outlast general storage security and the life span could be assumed to be greater than thirty years, and as with normal storage services the technologies should be resistant to component

and hardware changes as well as the algorithms used to store the data. Security issues could be classified into two parts based on the points at which these threats are possible.

F. Access Security

Communications to the cloud service provider is a potential point at which threats to the service could be exposed. A lot of research has gone into securing communication channels and have proved quite resilient to the threats that we come across. Though with the advent of mobile computing systems a potential threat to the security and possibly privacy of the users would be location security as this would entail the presence of communications to identify the location.

G. Service Security

In these scenarios most of the security threats are possible at the point of service provision and this could include the actual device security at the cloud provider and the storage security used by the provider. Though due to the business nature of the service providers they would be able to provide robust security with the use of state of the art IDS, firewalls and malware protection. Moreover the use of virtualization technology further helps the providers in securing each of the individual users from each other.

V. Benefits of Cloud Storage

- 1) No need to invest any capital on storage devices.
- 2) No need for technical expert to maintain the storage, backup, replication and importantly disaster management.
- 3) Allowing others to access your data will result with collaborative working style instead of individual work [6].

VI. Issues in Cloud Storage

Cloud Storage gets the attention of IT managers with its comparatively low cost and ability to easily adjust capacity. Although Cloud Storage offers reduction in the capital investment cost, customers has to face some of the technical, integration, security and organizational issues at various levels. People are hesitating to take up the Cloud services.

A. Control over the Data

Since the data is residing outside the enterprises infrastructure, it is perceived that the enterprise may loss the control over data. Although the concerns are largely hypothetical and psychological rather than actual, due to the immaturity of Cloud services, standards on the delivery of services and their evolving business model, users may have genuine concerns about the service providers' viability and operational processes [6].

B. Suitability of applications

A kind of more static data, inactive data, such as applications that include online backup and archiving is the best fit for Cloud Storage. The archiving kind of data works well in the Cloud because the data changes less frequently. These data do not require high speed transactional access. Bulk data can be easily compressed using data reduction technologies as well as it can be easily encrypted. Applications like content delivery [7] of rich media such as video, audio, or image files, Web 2.0 applications, user files and email repositories are some examples for best fit into the Cloud Storage. The applications with low I/O performance and tolerance for low downtime are suitable residents in Cloud Storage.

C. Data Deduplication

Data deduplication [8] [9] is a new technology in storage backup, recovery and archiving to reduce the occupied storage spaces by compress the internal duplication data. Data deduplication is the best way to dramatically reduce data volumes, slash storage requirements, and minimize data protection costs and risks [8]. For the exponential growth enterprise and science data, there will need a massive storage space, data deduplication will bring relevant big storage space savings and the cost reductions. For the huge scale of cloud storage, data deduplication will be a good solution to save storage volumes and make storage data move secure and reliable. But there still a problem about where to do data deduplication, e.g., whether in cloud servers or in clients.

D. Storage Security

Storage security involves storage media physical security and data security. As general network storage, the security of cloud storage includes certification, authority, audit and encryption, etc. Through automatic redundant replications the data will be easy recovery once failover. The cloud storage security can also expand to the whole procedure of storage service, including hardware, software, data, information, network security and clients' privacy security, etc. cloud storage is tending to combined with cloud security, which will provide more robust security [3].

VII. Conclusion

The paper proposes the architecture of the cloud storage, discusses the related key technologies and issues related to storage of data on cloud. There are hundreds of open discussions around the topic, and before trying to list the challenges, a precise definition need to be understood by the IT industry. Some aspects listed above will be researched deeply in an effort to make a good reference of the topic for academic and business purposes. An impartial approach will be applied to the project during the presentation of same proposed solutions.

VIII. References

- [1] Computer Weekly Article: A History of Cloud Computing.
- [2] Peter Mell and Tim Grande. (2009) NIST.
- [3] Research on cloud storage architecture and key technologies, WenyingZeng, 2009, china.
- [4] Oleshchuk, V.A.; Koien, G.M.; , "Security and privacy in the cloud a long-term view," Wireless Communication, Vehicular Technology, Information Theory and Aerospace & Electronic Systems Technology (Wireless VITAE), 2011 2nd International Conference on , vol., no., pp.1-5, Feb. 28 2011- March 3 2011.
- [5] EECE 571B, Term Survey Paper, April 2012 , "Survey Paper on Security and Privacy Issues in Cloud Storage Systems", Anup Mathew
- [6] IOSR Journal of Computer Engineering (IOSRJCE) ISSN : 2278-0661 Volume 1, Issue 1 (May-June 2012), PP 38-45, "Evolution of Cloud Storage as Cloud Computing Infrastructure Service", R. Arokia Paul Rajan
- [7] James Broberg, Rajkumar Buyya, Zahir Tari, MetaCDN: Harnessing, "Storage Clouds for high performance content delivery", Journal of Network and Computer Applications, 1012–1022, 2009.
- [8] FalconStor Software, Inc. 2009. Demystifying Data Reduplication: Choosing the Best Solution. http://www.ipexpo.co.uk/content/download/20646/353747/file/DemystifyingDataDedupe_WP.pdf, White Paper, 2009-10-14, 1-4.
- [9] Mark W. Storer Kevin Greenan Darrell D. E. Long Ethan L. Miller. 2008. Secure Data Deduplication. StorageSS'08, October 31, 2008, Fairfax, Virginia, USA. 2008, 1-10.
- [10] "Cloud Storage related Technologies", Tech Target, 2011.

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