



Association in Various Clouds and Client Using Proxy Framework

KEYWORDS

cloud mash-ups, cloud service provider (CSP), Cloud's Service Buyers (CSB), Proxy Framework Controller (PFW), Software as a service (SaaS), Platform as a Service (PaaS), Single Cloud (SC), and Multiple Clouds (MC).

Sandeep Muktinath Chitalkar

1Sinhgad Institute of Technology, Lonavala

Ashok M. Kanthe

2Sinhgad Institute of Technology, Lonavala

ABSTRACT Cloud computing is a method of providing resources over the Internet. Security challenges are still foremost concern when we considering collaboration between multiple cloud's service providers (CSP). In cloud, user's information or data is stored in multiple CSP. To access those information or data to other CSP user they need to pay amount or preestablished agreement between all CSP's. Having this issue in mind, this paper focus on the development of Proxy Framework Controller/ Environment (PFW), to determine the uploading and downloading the data or information from multiple CSP on request of Cloud's Service Buyers (CSB). More ever this research aims towards new framework to share data between multiple CSP. This framework also provides heterogeneous data storage on their respective cloud (Amazon, Rackspace and Cloud Sigma). This paper is a survey of the cloud environment and their different issues.

INTRODUCTION

Distribute system is a collection of autonomous computers linked by a computer network that appear to the users of the system as a single computer. By running distributed systems software computers are able to perform following tasks:

1. Coordinate their activity.
2. Share resources like Software, Hardware, and records.

Distributed Systems similar to Network of workstations, peer to peer system, Automatic Banking, Grid Cluster, A Distributed real time system (Automotive System), and Cloud Computing have become very popular among the users now a day's [1]. Users access the distributed systems for many reasons such as uploading, downloading, searching for the information, purchase of the good, and many applications those hosted remotely. The entire services providers maintain their quality and the requirement of the customers.

LITERATURE REVIEW

Computing is transformed to the model which having an services that are commoditized and delivered in a manner similar to traditional utilities like an water, gas, telephone etc [1]. In such models, clients consume the different services as per their requirements without knowing that where these services are hosted or how they are delivered to us.

Cloud computing is referred as "It is an computational model where multiple resources like storage equipments or devices, Database Records, Network's, Software and Hardware are abstracted and provide an services over the internet in remotely accessible fashion" [2]. Cloud computing represent a fundamental changes in the Information Technology (IT) Services are invited, deployed, developed, maintain and paid for the services. Support of cloud computing include minimizing capital operating expense, expenditure and improvement in capability, place and gadget (device) independency and high scalability. Cloud computing model allows accessing the information and computer resources from anywhere that a network connection is available.

Cloud provides their different services over the internet on Virtual machines (VM) and makes them accessible to the multiple users. Multiple VM may run on single physical computer sharing their resources such as memory, storage devices, CPU and so on. Sharing of the hardware resources by the multiple clients help in reducing the cost of the hardware for the client while increase the revenue for the service providers. Cloud services provides an services to the multiple users by many ways i.e. Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Desktop as a Service (DaaS) on pay per use basis or on demand self service [3]. Different services types of the cloud computing shown in figure 1.

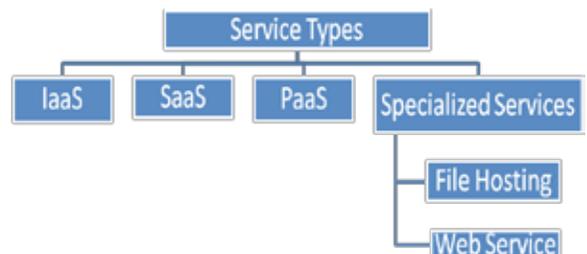


Figure 1:Cloud service types

Software As a Service (SaaS)

Software as a service (SaaS) is also known as on demand software. Software as a service (SaaS) refer as a software conditional model where service provider propose right to use software applications over the World Wide Web (WWW) to multiple users. SaaS software's don't require any customer specific installation or configuration work and due to this multiple users can be served from the same software instance. SaaS applications can be referred by multiple clients from multiple devices through either a thin client edges such as web browser or program interface. Clients do not manage or control the underlying cloud infrastructure including network, servers, operating system, database, storage or even individual application capabilities with possible exception or limited user specific application configuration settings. Typical examples of SaaS are CRM (Salesforce.com is online CRM system) and ERP software's.

Platform As a Service (PaaS)

Platform as a service (PaaS) is also known as cloudware. Platform as a service (PaaS) is defined as a computing platform being delivered as a service to the customer over the internet. Here platform is outsourced in place of data or service providers. Typically, PaaS provide resources over the internet on rent basis. It supports the faster development, management of running applications over the internet. It is integrated and inattentive from lower level infrastructure component. Typical examples of PaaS are Microsoft Azure, Cloudbees, and IBM BlueMix which provides development platforms.

Infrastructure As a Service (IaaS)

“Infrastructure as a service (IaaS) means customer or client obtaining cloud infrastructure (i.e. servers, network, and storage) in an on demand, elastic fashion and in pay as you go on model”[4]. Infrastructure as a Service (IaaS) is the delivery of computing on demand as shared services, avoiding the cost of asset in working and maintains the hardware. Typically IaaS examples are Rackspace, IBM SoftLayer, S3 (Simple Storage Service), Amazon EC2 (Elastic Cloud Computing) are open to public access based on charges per hour or on demand.

CHARACTERISTICS OF CLOUD COMPUTING

Following services are referred as cloud services shown in Table 1 (These characteristics are according to USA NIST [Mell and Grance, 2011]) [5].

Table 1
Characteristics of cloud computing.

Characteristics	Meaning
On demand self services	The Cloud Service Buyer (CSB) has a capability to modify network storages automatically due to interaction with each Cloud Service Provider (CSP).
Broad Network Access	CSB can access the service over the internet and accessed through any standard network accessing devices.
Resource pooling	Cloud services are provided to serve multiple CSB using standard network devices.
Rapid elasticity	The CSB must be able to rapidly scale up or scale down the level of the IT capabilities required.
Measured services	The CSB should have an accounting system in place that keeps the records of resource usages.

MULTIPLE CLOUDS (MC) (CLOUD MASH-UPS)

Now a day's so many organizations adopting cloud computing technology. Cloud Service Providers (CSP) are enhancing new methods to improve the capabilities of cloud environment i.e. Cloud mash-ups.

Cloud mash-ups are a Smart Service Enabler (SSE) of on-demand, real time, and web based services, with APIS that deliver services globally across the internet multimedia devices. Cloud mash-ups scenario shown in figure 2.

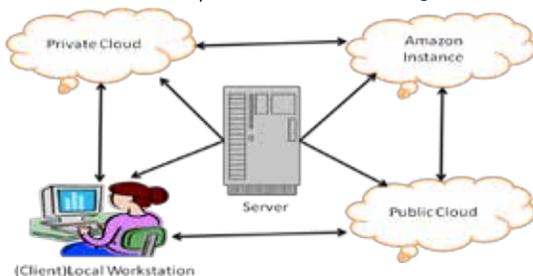


Figure 2: Cloud Mash-up scenario

Cloud mash-ups merge the different services provided by multiple clouds into a single service or application, possibly on premises of client or server side. Typical examples of cloud mash-ups are as follows [6]:

IBM mash-ups center that support rapid resource sharing and creation of new web applications.

Force.com provides different set of the libraries which enhance the development of the web and business application using the resources of Google Clouds and Salesforce.com.

Apprio cloud storage provides a cloud based storage services.

Collaboration between multiple cloud based services like cloud mash-ups, opens new opportunity for Cloud Service Providers to present more services to client or customers that will benefit the end users. For current Cloud mash-ups it's a mandatory to have a predefined agreement between cloud service providers as well as the end users. These features are for construction collaborative services do not bear quickness, elasticity and honesty. Another aspect is that it's too difficult for various cloud providers can get the group efforts so client can get an access from different service providers while client (he /she) is legitimate user from single cloud provider.

ISSUES IN CURRENT SYSTEM

Cloud computing has been cited as an “5th utility along with the electricity, water, gas, and mobile phones” whereas computing services are available on customer or buyer demands, like other services available in the human society. Cloud computing have limited support for resource management and provide support: negotiation between Quality of service and service level agreements. Several issues are addressed like service providers and clients, market registry for publishing and discovering CSP and their providing services, QoS, mode of payment as per services provided by CSP's [1].

Cloud computing is a way of providing better utilization of the resources using the virtualization methods. Cloud computing use different service delivery models by which different services are provided to the service buyers. Cloud services provides an services to the multiple users by many ways i.e. Software as a Service (SaaS), Platform as a Service (PaaS), Infrastructure as a Service (IaaS) and Desktop as a Service (DaaS) on pay per use basis or on demand self service. SaaS is a software deployment model where application is hosted remotely or by CSP and made available to the users on demand over the internet by paying charge as per uses. Data sharing between clouds is major issue in multiple clouds. The best security solution is implement web application framework [2].

Client need to established Service Level Agreement (SLA) with cloud service provides. Policies or agreements are differing as per the clients of the CSP each time. The CSP are bounded with only SLA signed between different CSB's. Author advice to encrypt a data before transferring to CSP. Author introduced multiple trust model which help for establishing secure communication between CSB and CSP. Hence the suitability of all these models for use in cloud computing environment needs extensive evaluation work [3].

Table 2 shows the survey for security algorithm and data integrity support in cloud environment.

Table 2
Security algorithm and Data integrity support in cloud.

Year	Cost	Security Mechanism	Environment	Support data integrity
2010[1],[2]	Low	-	SC	Yes
2011[3]	High	Depsky Algorithm	SC+MC	Yes
2011[4]	Medium	File Division method	SC+MC	Yes
2012[5]	Medium	Token method	MC	Yes
2013[6]	Medium	Proxy Framework	MC	Yes

There are so many challenges that are pulling back the expansion of the single cloud to multi cloud environment (Cloud mash-ups).

Current cloud mash-ups required pre-established agreement among the service providers as well as the cloud service buyer (CSB) [6]. CSP and CSB are both replay on the pay per use model. One of the well-known service are offered by the CSP is Data Storage, in which CSB don't want to store their data or information on their servers, instead of that they store their data on CSP side servers. These types of services don't provide flexibility for data storage but they provide the benefit for the amount of data they are going store for particular amount of time. In addition to that CSB can access those data from any location as long as they connected with the internet. In cloud mesh-ups data move remotely in cloud servers [7]. Cloud remotely share this data as per client request but CSB have to pay some charges to the CSP.

We focus on the new methodology i.e. Data as a Service (DaaS) which provides a data on demand to CSB across various platforms over the internet using proxy framework.

DaaS support data sharing from remote locations at any-time due to this it reduced the cost of data management. The main issue for implementing proxy framework is its introduction of proxies at different levels of the cloud service providers (CSP). These all Proxy Service Providers (PSP) or Proxy Service Controller (PSW) implemented by the CSP or the managed by the organization so they gained the information from multiple CSP. These PSP are used to establish secured communication of transaction between CSB and CSP. To protect the stored information on the CSP's side, PSP provides a trusted platform for CSP and CSB.

The system proposed in this paper offer a secure Proxy Framework which allows data security of the user as well as protects the cloud mashup against other external customers. This system also offers a wide usability model which helps the CSB to communicate with the multiple CSP through Proxy Service Provider. The proposed model offers an extra level of the security in which records (like text file, audio, video etc.) are uploaded in any CSP like Amazon, Rackspace and Cloud Sigma after undergoing encryption mechanism.

CONCLUSION

This paper review all the techniques related to the multiple cloud collaboration environments. This new proposed framework allows multiple clients or CSB to use services for low prices as compared to the single cloud environment. Major advantage of this framework is that non pre-established agreement between the multiple CSP for collaborating their services. Finally consumer gets their services without paying extra charges to each service providers.

REFERENCE

- [1]Rajkumar Buyya, Chee Shin Yeo, Srikumar Venugopal, James Broberg and Ivona Brandic, "Cloud Computing and emerging IT platforms: Vision, hype and reality for delivering computing as the 5th utility," *Journal of Future Generation computer* | [2]Systems, Vol.25, no. 6, pp.599-616, June 2009.S. Subhashini, V. Kavitha, "A survey on security issues in services delivery models in the cloud computing," Elsevier publication 11th July 2010. | [3] Mohamed Firdhous, Osman Ghazali and Suaidi Hassan, "Trust Management in cloud computing; A Critical Review," *International Journal on Advance in ICT for Emerging Regions* 2011 04 (02): 24-36. | [4]Yang Haibo and Mary Tate, "A Descriptive literature review and classification of cloud computing research", communication of the Association for Information Systems: Vol. 31, Article 2. | [5]www.thoughtsoncloud.com <http://thoughtsoncloud.com/2014/02/what-is-infrastructure-as-a-service-iaas/> | [6]Mukesh Singhal and Santosh Chandrasekar, Tingjian Ge, Ravi Sandhu and Ram Krishnan, Gali-Joon Ahn, and Elisa Bertino, "Collaboration in multicloud environments: Framework and Security Issues", published by IEEE computer Society IEEE, 2013. | [7]Zacharias Enslin, "Introduction to cloud computing and control objectives for information and related technologies (COBIT) – mapped benefits of cloud computing adoption", *AJBM* Vol.6 (41), pp. 10568-10577, Oct 2012. Available at <http://academicjournals.org/AJBM> | [8]Armbrust, M. A. Fox, R. Griffith, A. D. Joseph, R. Katz, A. Konwinski, et al (2009) "Above the clouds: A Berkeley view of cloud computing," www.eecs.berkeley.edu/Pubs/TechRpts/2009/ECS-2009-28.pdf (Current Jan. 20, 2010). |