Towards and effective methodology for Multi cloud data storage

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Abstract

Multi-cloud is the process of using multiple cloud together and providing the storage services in a single network architecture which demonstrates the distribution of cloud assets, software, applications, and more principles across several cloud environments. The Multi-cloud environment combines various services where every platform offers the process of storage and security which allows several organizations to customize the infrastructure which is more specific to improve their business goals. This multi-cloud environment has the ability to perform at any risk analysis as and when one web service host fails. It has the tendency to continue the operation with other platforms in multi-cloud environment by storing all data in one place. The main issue in Palo Alto Networks is that it does not have the ability to build data center capacity quickly which is enough to connect the upgrading needs of application teams. In this paper we study the Avi netwoks which is fully elastic, multicloud application and a enthusiastic delivery platform with centrally managed distributed load balancers. It offers unprecedented application insights to focus applications and network performance issues. The Avi Vantage not only reduces TCO by neglecting hardware and over planning requirements, but also auto scales on-demand in response to real-time congestion occurs.

Key words: avi networks, cloud environments, multi cloud, multi cloud architecture, Palo Alto networks

INTRODUCTION

Multi-cloud is the process of two or more cloud computing services available from any number of different cloud vendors. A multi-cloud environment could be all-private, all-public or a combination of both. Organizations use multi-cloud environments to

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distribute computing resources and reduction of risk without data loss. They can also increase the computing power and storage available to a business. Innovations in the cloud in recent years have resulted in a move from single-user private clouds to multi-tenant public clouds and hybrid clouds — a heterogeneous environment that leverages different infrastructure environments like the private and public cloud.

Cloud provides a better feature to allow the user to store their data remotely (Qian Wang and Cong Wang may, 2011) on the server than in local. Thus he/she can access the data from anywhere over the Internet. Thus, security and accessibility of the client's data must be guaranteed. Main contribution of this paper is to effectively detect any unauthorized data accessing and modification, possibly intrusion and session hijacking attacks, zero day attacks (Huaqun Wang and Debiao He, Shaohua, 2016). Besides, in the distributed servers when such problems are successfully detected, to find out as to in which server the data leak lies in is also of great significance, since it can always be the first step to fast recover the accessibility errors and/or identifying potential threats of external attacks.

To solve these problems, better file access security and privacy-preserving mechanism (Ximeng Liu andWenxiu Ding, 2016) are presented in this proposed model of access control. The first process of this
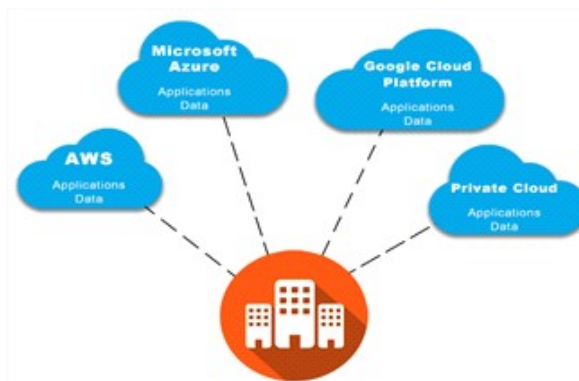

Fig.1. Muti cloud Architecture

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proposed model is devoted to a review of basic tools from coding theory that is needed for file uploading and data sharing (Gongjun Yan and Ding Wen,2013) over the cloud servers. Then, the unique user and file attribute (Wenhai Sun and Shucheng Yu, 2014) are introduced to preserve access security.

The attribute computation function in the proposed scheme is belonged to a family of universal hash function, chosen to preserve the unique properties, which can be perfectly integrated with the verification of accessible data. Subsequently, it is shown how to validate the user and his/her respective file attribute for verifying the storage correctness and also identifying misbehaving users on the cloud.

CLOUD SERVICES MODELS

There are three types of cloud computing services models (Sharmila *et al., 2018*).

A. Software as a Service (SaaS)

Cloud customers discharge their applications in a facilitating domain, which can be achieved through systems from different customers (for example Internet browser, PDA, and so forth.) by application clients. Cloud buyers don't have command over the cloud foundation that regularly utilizes multi-occupancy framework design, to be specific, distinctive cloud customers' applications are sorted out in a solitary coherent condition in the SaaS cloud to accomplish economies of scale and streamlining as far as speed, security, accessibility, catastrophe recuperation and upkeep. Instances of SaaS incorporate SalesForce.com, Google Mail, Google Docs, etc.

B. Platform as a Service (PaaS)

PaaS is a development platform supporting the full "Software Lifecycle" which allows cloud consumers to develop cloud services and applications (e.g. SaaS) directly on the PaaS cloud. Hence, the difference between SaaS and PaaS is that SaaS only hosts completed cloud applications whereas PaaS offers a development platform that hosts both completed and in-progress cloud applications. This requires PaaS, in addition to supporting application hosting environment, to possess development infrastructure including programming environment, tools, configuration management, and so forth. An example of PaaS is Google App Engine.

C. Infrastructure as a Service (IaaS)

Cloud purchasers straightforwardly use IT foundations (preparing, capacity, systems and other crucial computing assets) gave in the IaaS cloud. Virtualization is broadly utilized in IaaS cloud so as to incorporate/deteriorate physical assets in a specially appointed way to meet developing or contracting asset request from cloud customers. The essential procedure of virtualization is to set up free virtual machines (VM) that are separated from both the basic equipment and different VMs. Notice that this methodology is not the same as the multi-tenure model, which plans to change the application programming engineering with the goal that different cases (from various cloud shoppers) can keep running on a solitary application (for example a similar rationale machine). A case of IaaS is Amazon's EC2.

D. Data as a Service (DaaS)

The conveyance of virtualized stockpiling on interest turns into a different Cloud administration - information stockpiling administration. Notice that DaaS could be viewed as a unique kind IaaS. The inspiration is that on premise venture database frameworks are regularly tied in a restrictive forthright expense in devoted server, programming permit, post-conveyance administrations and in-house IT support. DaaS enables purchasers to pay for what they are really utilizing as opposed to the site permit for the whole database. Notwithstanding conventional capacity interfaces, for example, RDBMS and record frameworks, some DaaS contributions give table-style deliberations that are intended to scale out to store and recover a tremendous measure of information inside an extremely compacted time period, frequently excessively huge, excessively costly or unreasonably moderate for most business RDBMS to adapt to. Instances of this sort of DaaS incorporate Amazon S3, Google Big Table, and Apache HBase, and so on.

Cloud administration models are ordinarily separated into SaaS, PaaS, and IaaS that displayed by a given cloud foundation. It is useful to add more structure to the administration, demonstrates a cloud reference design that makes the most significant security-important cloud segments unequivocal and gives a theoretical review of cloud computing for security issue examination.

MULTI-CLOUD

The next logical progression in cloud computing is in multi-cloud computing, or cloud systems that utilise numerous cloud networks and services simultaneously (Elkhatib 2016). In short, multi-cloud systems simply use more than one CSP. It is understood that in multi-clouds, the user or business in question utilizes different cloud services for different applications in their business. For example, the user may store data on a private cloud, share documents on the Google Cloud platform, and perform data analysis on yet another cloud. According to Petcu (Petuch 2013), multi-cloud computing directly addresses 10 key issues that are given below

1. Dealing with peaks in service/resource requests using external ones on demand;

2. Optimising costs or improving quality of services;

3. Reacting to changes of the offers by the providers;

4. Following constraints such as new locations or laws;

5. Ensuring the high availability of resources and services;

6. Avoiding the dependence on only one external provider;

7. Ensuring backups to deal with disasters or scheduled inactivity;

8. Acting as intermediary;

9. Enhance own Cloud service/resources offers, based on agreements with others; and

10. Consuming different services for their particularities not provided elsewhere.

LITERATURE SURVEY

Cloud computing is hot trending, commercially gaining and flexible environment for providing online services for the Client over the Internet. The Client can register on cloud and access the cloud services for free or by pay per service manner. In cloud environment there is no need for the physical system implementation web servers, database servers and file servers can be implemented virtually (Yang Xiang and LinglingXu, 2015).

There is a concern about moving large amount of data into a single cloud is similar to vendor lock-in risk. Depsky Shacham and Water (2008) deal with stores data, even critical data into multiple clouds assuming data availability and security. Shaik. Aafreen Naaz [7] author reviewed the cloud computing features provides more benefits to the users in terms of low cost and availability of data, providing security to the cloud computing is a mian factor. The single cloud service provider for outstanding is not trusted because of failure in service availability and possibility of attacker like malicious virus which corrupts the stored data.

Here a multi-cloud is emerged by inter clouds or cloud of clouds where research related to single cloud problems can be addressed by using multi-cloud. Many new tools like Apache library cloud which provides a unique interface on different clouds for convenient deployment of multi-cloud services information given in [7]. This methodology helps in communication between different clouds. (Thandeeswaran *et al.* 2013)., has reviewed that security need tobe addressed as major concern for handling critical application and sensitive information. The use of multiple cloud has following advantages 1. Exchange of data from multiple clouds. 2. Selection of clouds based on price and services.

METHODOLOGY

Multi-cloud is the process of two or more cloud computing services available from any number of different cloud users. A multi-cloud environment should have the tendency of all-private, all-public or a combination of both. Since it does not loss any data during transfer, it is more uptrend nowadays.

A. SECURITY

The most efficient principle in Multi-cloud is its security which has the unique challenge of protecting data in a consistent way across a variety of cloud providers. When an organization uses a multi-cloud approach, the third-party partners handle different aspects of security. It is important in cloud deployment to clearly define and distribute security responsibilities among the parties.

B. AVI NETWORK ASPECTS

The Avi Vantage Platform is a fully elastic, with supporting multicloud application delivery platform with managed centrally, and has the distributed load balancers.

♦ Avi offers unprecedented application insights to viewing applications and network performance issues.

♦ Avi Vantage not only reduces TCO by eliminating hardware and overprovisioning requirements, but also autoscales on-demand in response to real-time congestion.

♦ The Avi Vantage Platform is made for the purpose of cloud and mobile era using a unique analytics-driven,with 100% software approach.

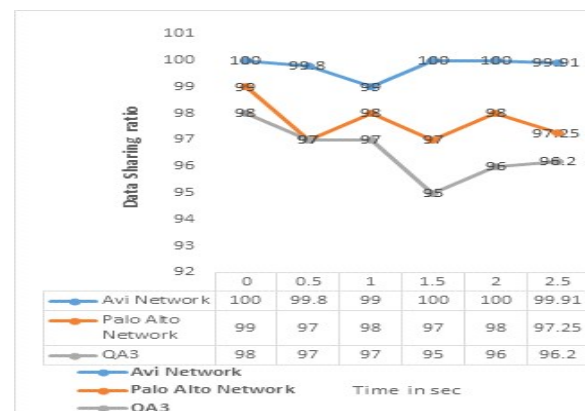♦ Avi Vantage is the first platform to leverage the power of software-defined principles to achieve

	0	0.5	1	1.5	2	2.5
Avi Network	100	99.8	99	100	100	99.91
Palo Alto Network	99	97	98	97	98	97.25
QA3	98	97	97	95	96	96.2

Fig.2. Analysis of Time Consumption in data sharing

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unprecedented agility, insights, and efficiency in application delivery.

RESULTS AND DISCUSSION

In terms of leveraging application programming interfaces to automate the provisioning of networks, it's clear networking technologies have been lagging behind advances made in both compute and storage infrastructure. The challenge and the opportunity vendors such as VMware now see is the ability to more holistically manage IT environments spanning from the network to the application. As part of that strategy, VMware has been making a string of acquisitions to extend its core virtual machine franchise.

It's still too early to say whether all those investments will pay off for VMware. Reliance on VMware technologies in public clouds is relatively slight compared to the dominance VMware has today in on-premises IT environments. VMware is banking that its ability to extend the reach of its portfolio to foster the development of hybrid cloud computing, which is strongly anchored around on-premise IT environments that still run the majority of the workloads in the enterprise, will prevail.

The Avi Vantage streamlined environment provisioning and workload migration and reducees the average hosting time by several hours, by showing high performance in monitoring. The possibilities in Avi network is managing each device separately with no automation no visibility into application tra-ffic and Static capacity. There are some peculiar examples of cloud providers as follows.

AWS

• Google Cloud Platform

• IBM Cloud

• Microsoft Azure

• Openstack (private cloud)

• Rackspace

• VMware Cloud

CONCLUSION

Cloud computing is a blossoming technology with numerous applications in many industries, including remote computing and storage. Though vendor lock-in and cyber security are major concerns hybrid clouds, multi-clouds, and federation clouds may address some of these problems by providing users with alternatives in the case of scheduled maintenance, breaches, or shut-downs, though each has their own benefits and disadvantages. The major area of concern in this field is the agreement between the cloud service providers for collaboration of their services in multi-cloud. The consumer will get highly benefited with multi-cloud environment and obtain service based on his preferences and requirement and not based on his cloud service provider.

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