

# Exploration of Cloud Computing Perceptions

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## Abstract:

The intent of this article is to get a survey of the database services available in cloud computing environment, analysis the security risks connection and introduce the available counter measuring to minimize the risks. And also analysis's the cloud database service providers namely; Amazon and google. The reason of selecting these are providers is because they are currently amongst the leading cloud database providers the relational cloud databases which make the separation. A cloud user can utilize various computing resources(e.g. network, storage, software application),The target has been to provide an overview of their database services as available more than that security measurements. It has been annexed at the end of the report to help with technical configurations of database migration and connecting applications to the databases for the cited cloud database providers.

**Keywords — Amazon,Google, Cloud Computing, Cloud Database Service, Performance and Security Risks**

## 1. INTRODUCTION

Cloud computing has all the security impact that associated with distributed authority on the Internet and plus other security issues borrowed from virtualized and pooled resources[4].Data storage in a cloud background is one of the most important immerse from a security point of reality. Because several cloud consumers from the same or different organization can use the same application and ability to use it, concern security risks should be evaluated and solved before private and sentient data, applications and system execution are moved into the cloud [1, 2]. Multi-tenancy has required a policy enforcement mechanism. The enhancement of cloud security is based on the confidentiality, interfirity and availability of the database system in the cloud environment.

## 2. METHODOLOGY

The research have taken for this article are present in the necessary step and also implementing the methods, The different cloud-based sequence models, along private, public or hybrid cloud, carried out with the extent of challenges, and security responsibilities to all [3]. The cloud service model that an organization wants to

implement security design and implementation. We will discuss about this three cloud computing service models. The Models are DAAS-Data as a Service, IAAS- Infrastructure as a Service and NAAS- Network as a Service [4, 5].The cloud service model that an organization wants to implement influences security design and implementation. We will discuss about this three cloud computing service models. The Models are DAAS-Data as a Service, IAAS- Infrastructure as a Service and NAAS- Network as a Service [6].

## 3. The Cloud Deploy Models -Services

The three main-cloud service delivery models are: Data as a Service (DaaS), Infrastructure as a Service (IaaS) and Network as a Service (NaaS).

### 3.1 Data as a Service

It is a cousin of software as a service [1]. DaaS is based on the idea that the product, data in this case, can be determining on demand [2] to the user regardless of geographic or organizational separation of provider and consumer. Additionally, the appearance of service-oriented architecture has rendered the actual platform on which the data resides also irrelevant [3]. This growth has enabled the recent emergence of the relatively new concept of DaaS. Data provided as a service was at first primarily used in web mashups, but now is living increasingly employed both commercially and, lesser commonly, within organizations like as the UN [4].

Traditionally, most enterprises have used data stored in a self-hold repository, for which software was specifically established to access and present the data in a human-readable form [6, 7]. One result of this paradigm is the gathering of both the data and the software needed to interpret it into only one package,

sold as a consumer product. As the number of bundled software/data packages proliferated and required interaction among each other, another layer of interface was mandatory. These interfaces, altogether known as enterprise application integration, often tended to encourage vendor lock-in, as it is usually simple to integrate applications that are built upon the same foundation technology [5].

The result of the combined software/data consumer package and required EAI middleware has been an increased amount of software for organizations to manage and maintain easily for the use of particular data. In addition to normal costs, a cascading amount of software updates are required as the format of the data changes [7]. The reality of this situation contributes to the attractiveness of DaaS to data consumers because it allows for the separation of data cost and usage from that of a specific.

### **3.2 Infrastructure as a Service**

This is the base layer of the cloud stack. Its work for a foundation for the another two layers, for their execution. The keyword after this stack is Virtualization. Amazon Elastic Compute is a good example of an IaaS. In Amazon Elastic Compute Cloud your application will be executed on a virtual computer it may also called as instance. You have your choice of virtual computer, definition that you can select a configuration of CPU, memory and storage that is optimum for your application [8]. The IaaS supplies the whole cloud infrastructure i.e.: hardware (loading items), switches, router, servers, firewalls, storage and other network equipment. The consumer buys these resources for his needed basis. One more feature I liked about Amazon Elastic Compute, which is perhaps supplies by other IaaS providers as well, is Elastic Load Balancing. This attribute can auto-deliver an application's incoming traffic across multiple Amazon EC2 instances (virtual computers). The Amazon EC2 SLA (Service Level Agreement) guarantees 99.95% availability of the service within a region over a trailing 365 day period [9]. The user then uses these resources to set up a complete environment with their own choice of operating systems and applications according to their own needs. In IaaS the user has control over the operating system, storage, and deployed applications. However, the users do not manage or control the underlying cloud infrastructure.

### **3.3 Network as a Service**

To design for open stack. This will be another big breakthrough in terms of virtualizing the network infrastructure in the cloud. The key features consist of compute for interconnecting two VM instances to different virtual networks, network services insertion and request "adaptive" network resources. Open Stack: NaaS will contribute network resources required to interconnect Open Stack zones and network resources required to support new services like virtual private cloud. According to Seeking[8] Alpha and offering Cisco, there are still various open questions to compare, but in the future, this Network as a Service would be elaborate to hold SLA, Network level QoS and other network based auditing/analyzing services, beyond assign services like interconnecting two VM instances

or providing resources required to interconnect Open Stack "Zones" or geographically dispersed computer/storage resources.[9].

## **4. CLOUD DEPLOYMENTS MODELS**

Cloud computing is composed into four deployment models, namely private cloud, public cloud, community cloud, and hybrid cloud as discussed briefly below:

### **4.1 Private cloud**

In a private cloud model, the infrastructure is provided for regular use by a individual organization [3]. The elementary infrastructure could be on or off premise and the management serviceable tasks can be carried by the organization itself, Private clouds are the only option when it comes to protecting highly sensitive data. A private cloud might be on or off the premises of the organization. Based on this choice, there are two various implementations of a private cloud: (1) in-house and (2) hosted.

### **4.2 Public cloud**

In public cloud model, the cloud infrastructure is available for open use by everyone including general public or a large industry groups. [10, 11] The entire underlying infrastructure is built and managed by the cloud provider and the consumers only require internet access in order to utilize the available services. Public clouds are not very secure and as a result they are not recommended to be used for any type of sensitive data at all. This cloud introduced the service and has the following

Characteristics:

- It supports multiple customers;
- Often utilizes shared infrastructure;
- Supports connectivity over the internet;

### **4.3 Community cloud**

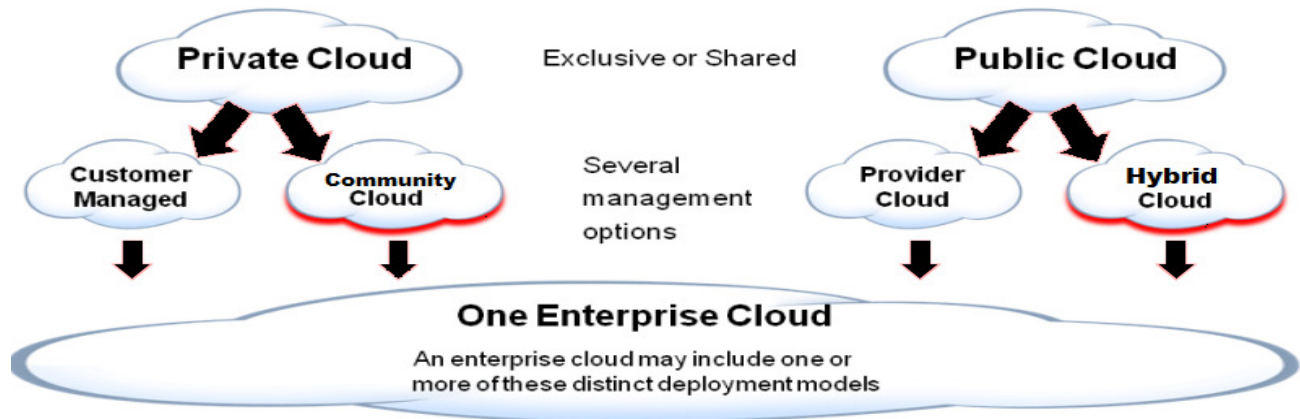
In community cloud model, the cloud infrastructure is used exclusively by a community of users that have the same requirements and concerns (security needs, law compliance and policy considerations). The underlying infrastructure can be managed and owned jointly by the members of the community or a cloud provider can be chosen for the management and operational tasks. This model has the security benefits similar to private cloud but is more cost efficient than owning an on-premise private cloud [13]. A community cloud can occupy on premise or off-premise. The hosting organizations or third party cloud services manage this community cloud.

### **4.4 Hybrid cloud**

A hybrid cloud is formed when two or more distinct cloud infrastructures are used together. For example when a private cloud and community cloud is used together, or when public and private cloud infrastructures are used together then the solution is

known as the hybrid cloud [15]. Hybrid clouds are usually used when there are different security requirements for different sets of data. For instance,

highly sensitive data can be kept in a private cloud while less sensitive data can be uploaded to a public cloud.



**Fig 1: Deploy Models in Cloud**

## 5. CLOUD COMPUTING ADVANTAGES

Cloud computing proposes numerous advantages to both individuals and organizations. The main advantages and driving factors behind cloud computing is the fact that it is economically very favorable. It allows consumers to access a huge range of applications and services without downloading or installing anything [16]. The underlying infrastructure and network is managed and operated by an external provider, and the consumers get rid of maintaining servers, training IT employees as well as purchasing software licenses which results in an overall minimization of monetary costs in training, power consumption, infrastructure maintenance and storage space. Thus users will be able to access data wherever they are without being dependent to a specific location [17]. Cloud computing is also considered quite safe in terms of redundancy.

## 5.1 Services of Cloud

The services are now offering a new service besides the traditional services (DaaS, IaaS and Naas) known as Database as a service which is essentially an on-demand

database accessible to the consumers from the cloud over the Internet. In the multi-instance model each consumer is provisioned with a unique DBMS running on a dedicated virtual machine belonging only to a specific customer [18]. This feature enables consumers to have better control over administrative and other security related tasks such as role definition and user authorization. On the other hand, the multi-tenant model uses a tagging method and provides a predefined database environment that is shared by many consumers.

## 5.2 Security Issue

Volatide databases into cloud environment brings a number of security concerns that organizations have to take into consideration as the ultimate responsibility for data security assurance is with organizations and not with providers. When internal databases with sensitive data are migrated to the cloud, users need to be assured that proper database security measurements are in place that encompasses data confidentiality, integrity, and availability. The main aspects of database security in the cloud are that data must be secured during at rest, in transit, and in use, and access to the data must be controlled. Develop and deploy a prototype of designed authorization service that will contain the main important features and findings of this investigation [12].

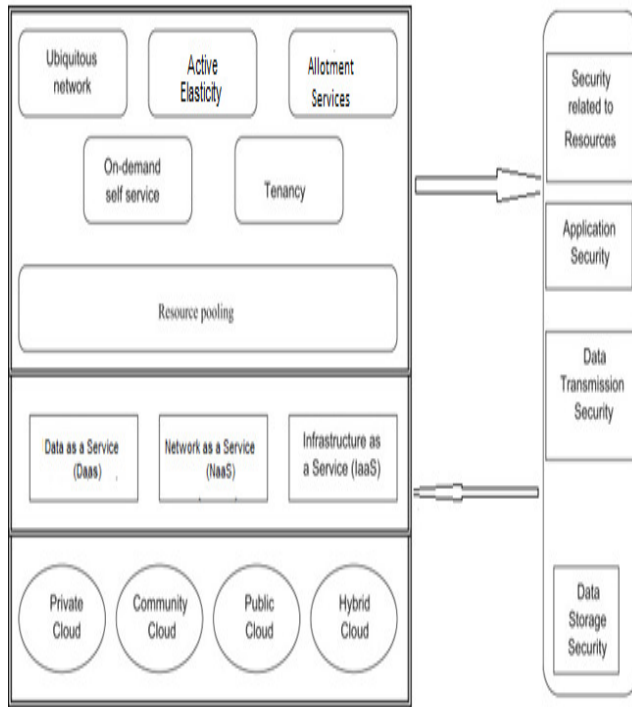


Fig: 2 Cloud Architecture for Data Storage Security

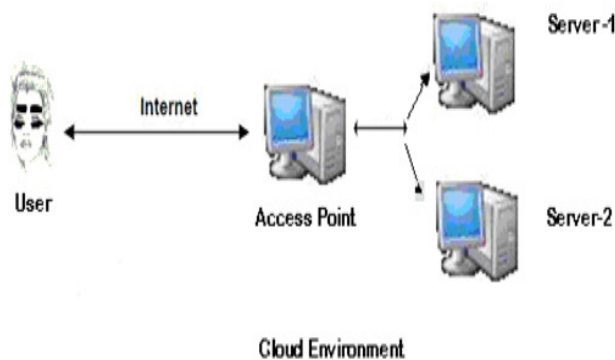


Fig: 3 Cloud User Environment

- Failures in Provider Security
- Attacks by other Consumers
- Accessibility and Authenticity Issues
- Authorization and Regulatory Issues
- Consumer Security Systems which Interacting the provider

### 6.1 Failure in Provider Security

The overall threats that Provider controls the networks & Servers, etc. Consumer should trust provider's security, Failures may Corrupt CIA principles. The Countermeasures are Check and monitor the provider's security and External verification may suffice for SMB, provider security may exceed customer security [12].

### 6.2 Attacks by other Consumers

The overcome threats are Provider the resources shared with untreated parties the examples is CPU, storage network. Consumer's data and applications should be separate failures will violate CIA principles. The Countermeasures are Hypervisors for compute separation MPLS, VPNs, VLANs, firewalls for network separation Cryptography and Application layer scattered [19, 20].

### 6.3 Availability and Reliability Issues

The Overcome threats are Complexity increases chance of failure, Clouds are prominent attack targets, and Internet reliability is spotty [21]. Gathered the resources may provide attack vectors but cloud provides focus on availability. The Countermeasures are Evaluate provider measure to make secured the availability, Monitor availability carefully Plan for downtime use public clouds for less fundamental applications.

### 6.4 Legal and Regulatory Issues

The Overcome threats are Laws and regulations will prevent cloud computing, Requirements to retain control Certification requirements that not met by the provider. The Countermeasures are evaluate legal issues and requires provider compliance with laws and regulations, Restrict geography as needed [22].

## 6. DEFECTS OF SECURITY THREATS AND ITS MODELS

The chief concern in cloud environments is to provide security around more than one tenure and isolation, giving consumers more comfort besides "trust us" ideas of clouds. There has been survey works reported that classifies security threats in cloud based on the nature of the service delivery models of cloud computing system [19]. The identified threats and countermeasures are:

### 6.5 Integrating Provider and Customer Security Systems

The Overcome threats are Divide the provider and consumer security systems, Fired employees retains access to cloud is behavior in cloud not reported to customer. The Countermeasures is at least, integrate analyze the management consistent access control and worthier the integrate monitoring and notifications



## 7. CONCLUSION & FUTURE WORK

In an emerging development, like cloud computing, security needs to be analysed repeatedly. With advantage in cloud technologies and increasing number of cloud users, data protection dimensions will continuously increase. Optimal cloud security practices should include encryption of sensitive data used by cloud-based virtual machines, centralized key management that admit the user (and not the cloud provider) to control cloud data; and ensuring that cloud data is accessible according to established enterprise policies.

To address the security threats and issues relevant to cloud computing and virtualization, this paper outlines suggested security best practices in virtual and cloud environments. For virtualized environments, private cloud, portions of hybrid clouds, and public Infrastructures as a service (IaaS) deployments, the enterprise, not the service provider, needs to be responsibility for security.

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