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Migration of On-premise to Cloud Storage

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Abstract

A developing business model called cloud computing offers clients access to apps, data, computing power, and operating systems as a service. It represents an original method of designing and remotely controlling computing resources with little management work or service provider involvement. Security and the threats associated with it came more to attention as it was utilized and communicated, ensuring the privacy of the data. The study's focus will be on the security risks of confidentiality, integrity, and availability and how those risks affect how cloud users see security in the cloud. In order to gather the data, a qualitative research methodology was used and semi-structured interviews with 6 users who had prior experience with the cloud were done.

More research is required to determine how existing systems should be connected to the cloud and what effects the migration would have. In the setting of a small software firm, the purpose of this thesis is to communicate our experiences and learnings from implementing cloud computing for an on-premise corporate application. Our research yielded a number of insightful findings. The primary potential and difficulties associated with cloud computing were first noted.

The largest cloud platforms were examined and contrasted next. Third, a cloud prototype was created using the current system as a basis. The behavior of comparable systems in two contexts (on-premise and the Cloud) and under various situations in the Cloud was evaluated using this prototype, taking into account issues like performance and cost.

Keywords: Security, Cloud consumer, Cloud migration, Trust, Compliance, Proactive, enterprise application

1 Introduction:

Cloud computing is the delivery of a hosted service over the internet. It allows users to access their data through the internet and allows them to use their applications and software as if they were on-premise. This paper will analyze cloud computing on-premise computing and compare it to traditional IT services. Cloud computing is a popular business model, with many people choosing to have their applications hosted on the cloud. However, the infrastructure that the cloud provides can pose problems for users who are not prepared for it. In this paper, we will analyze cloud computing on-premise computing and determine whether or not it is better than traditional on-premises computing.

The first step to analyzing cloud computing on-premise computing is to determine what exactly cloud computing is. Cloud computing is a form of computer networking where data and services are stored and accessed over the internet instead of within a single computer or server (Wikipedia). This leads us to our second step: determining whether or not cloud computing makes sense for our research topic. We believe that it does make sense because we are interested in how companies can use cloud technology when they do not have the resources available to run their own servers without sacrificing performance.

At the beginning of this project, it was stated that cloud computing is a way to provide computing resources to users without having to install or manage those resources. This paper will focus on On-premise Computing and how it compares to cloud computing. Cloud computing is a term used to describe a variety of services that allow users access to computer resources over the Internet. It has been said that cloud computing is “an umbrella term for on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort” (Hewlett-Packard). On-premise Computing refers to computers and other devices connected directly to one another through cabling. In contrast, Cloud Computing refers to computers connected through networks such as the Internet. In this paper, we will compare the two terms by looking at how they differ in their types of usage: what type of device is used for each type? What type of software is used? How much money does each one cost? What are their advantages and disadvantages? Then we will make our conclusions based on these findings. The role of cloud computing in the digital world has become increasingly important and popular. Cloud computing refers to the use of a remote server to provide resources such as storage and processing power, as well as access to software applications. In this paper, I will discuss what cloud computing is, how it benefits businesses and consumers, and how it can be used by both.

2 Cloud computing

2.1 Background

The term "cloud computing" often refers to the provision of computer resources through the Internet on a utility basis. Electricity and water delivery systems are frequently used as examples to teach cloud computing. They offer centralized resources that are open to everybody, much like the Cloud. Additionally, with cloud computing, you only pay for what you use. And finally, it is typically used by those who find it impossible or undesirable to create the required resources on their own.

Broad network access, resource sharing, and on-demand self-service are other indicators. According to Buyya, Broberg, and Goscinski (2011), cloud computing is built on four technological fields:

Hardware and Internet technologies

- Computerised distribution
- System Administration

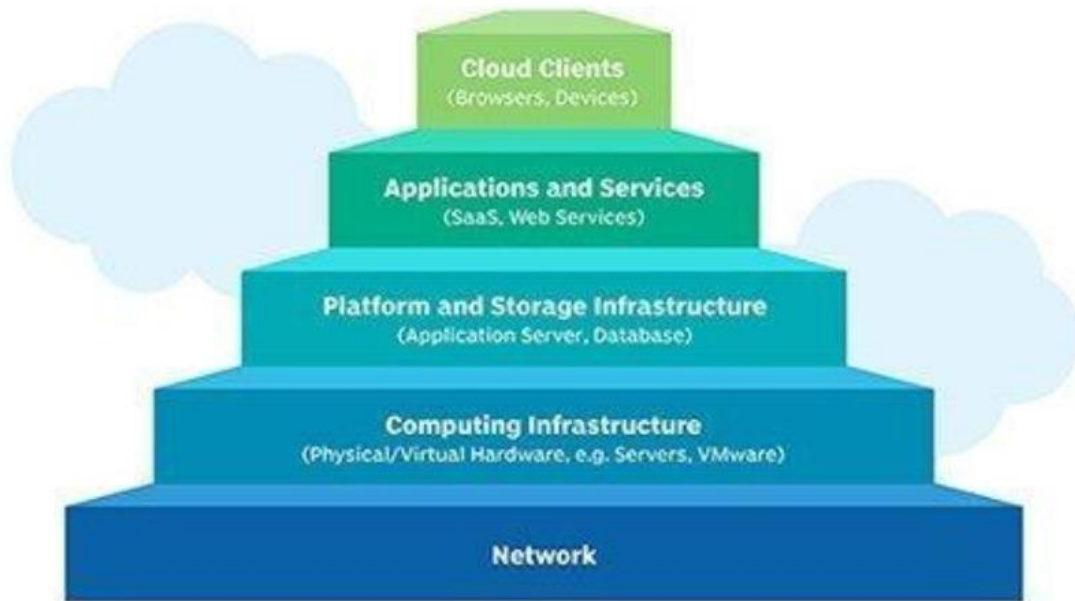
These four fields have seen significant advancements because of information and communications technology (ICT), which has sparked the growth of cloud computing. Different uses for servers and computers to transmit and exchange data are accepted by Internet technology. Technologies of distributed

computing are crucial because they provide accessibility, making it possible to gather the organization's data from numerous servers.

2.2 Cloud Computing Stack's Layers

In a broad sense, cloud computing may be thought of as a fusion of infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS). The foundation of cloud services is web-based service offers, which acted as a forerunner to modern cloud offerings. All of the existing Cloud solutions may be broadly divided into the following four groups:

- Many IT service providers are not in the business of selling Web-based services, but they have teamed together to support clients in implementing these products by offering web-based versions of standard applications used by many organizations. One illustration is a travel reservation system for business trips. Rich Internet Applications (RIAs), which deliver a particular service via the web, are examples of web-based service offerings. Facebook, Zillow, Google Apps, and Flickr are a few examples.
- Complete programs that are given online and may be customized by customers are included in Software-as-a-service offers. Salesforce.com is an example of a full CRM application that is provided as a service; customers just need to pay Salesforce.com a monthly use fee in accordance with their agreement and are free from worry about infrastructure and software licenses.
- Offerings for Platforms as a service are externally hosted services that offer whole platforms for building, deploying, and running applications, including development, administration, and user-management tools. These services consist of products like Google App Engine and Force.com (used to customize the SaaS salesforce.com offering). Aside from a few notable outliers like IBM, the majority of IT service providers presently don't truly compete in the PaaS market, although many of them do give consultancy and development support to help customers utilize platforms offered by other companies.
- Full infrastructures on which clients may deploy applications are included in Infrastructure-as-a-service, as well as individual infrastructure services (such as virtualized hosting, utility storage, and processing capacity). Currently, the majority of cloud service providers either already provide IaaS (Amazon, Rackspace, etc.) or are actively striving to create as-a-service products for processing, storage, networking, and other services



2.3 Cloud computing deployment models

According to Carroll (2011), cloud computing services and technologies are used in a variety of delivery methods depending on their qualities and intended use. the following deployment scenarios:

- Public Cloud
- Private Cloud
- Hybrid cloud
- Community cloud
- Virtual private cloud

3 Analysing On-Premise Storage and Cloud

3.1 Current State of On-Premise IT:

Consolidation is now taking place in businesses to minimize their operational footprint. By investing more of their available resources in their core business rather than in IT operations, they are becoming leaner in order to keep their competitive edge.

Here are a few of the most recent developments in on-premises enterprise IT:

- **Application consolidation** -Most organizations' on-premise IT has been integrated with the company through time, making it simpler to comprehend the needs of the business. There is software that do comparable tasks in multiple departments of an organization. Businesses are building a common pool of apps as part of organizational consolidation that can be accessible by all departments. Application consolidation has several benefits, including smaller application footprints that reduce maintenance costs, more efficient IT operations, and better support.
- **Data Center consolidation** - By switching to blade servers, data centers across all enterprises are executing server consolidation programs. As a result, data centers' space and energy footprints have decreased. Enterprises may save money on IT operations thanks to data center consolidation, giving them the confidence to expand their infrastructure to take advantage of cloud infrastructure possibilities.
- **Application development** - More and more businesses are choosing generic systems with little adaptations. This has also happened because businesses have changed their business processes, which has simplified the IT needs for a particular business process. The adoption of the cloud depends on this change in business IT because the majority of cloud products are standard with little front-end customisation.
- **Outsourcing** - It is now simpler to pick up a pool of apps and outsource them thanks to consolidation. In recent years, greater performance, cost reductions, and enhanced Service Level Agreements (SLAs) with sourcing partners have pushed the boundaries of what can and should be outsourced in companies. This is a crucial point to remember when thinking about cloud computing because businesses already rely on vendors outside their walls to maintain and support their mission-critical software, so why can't we do the same by moving our applications to the cloud?

3.2 Comparison of On-premise and Cloud

3.2.1.Cloud Computing:

Pros:

- **Scalability:** Cloud computing provides the flexibility to scale up or down the resources required for storage and computing.
- **Accessibility:** Cloud storage can be accessed from anywhere with an internet connection, which makes it more convenient for remote work.
- **Cost-Effective:** Cloud storage eliminates the need for expensive hardware and maintenance costs associated with on-premise storage.
- **Disaster Recovery:** Cloud providers offer automatic backups and disaster recovery solutions, which reduces the risk of data loss.

Cons:

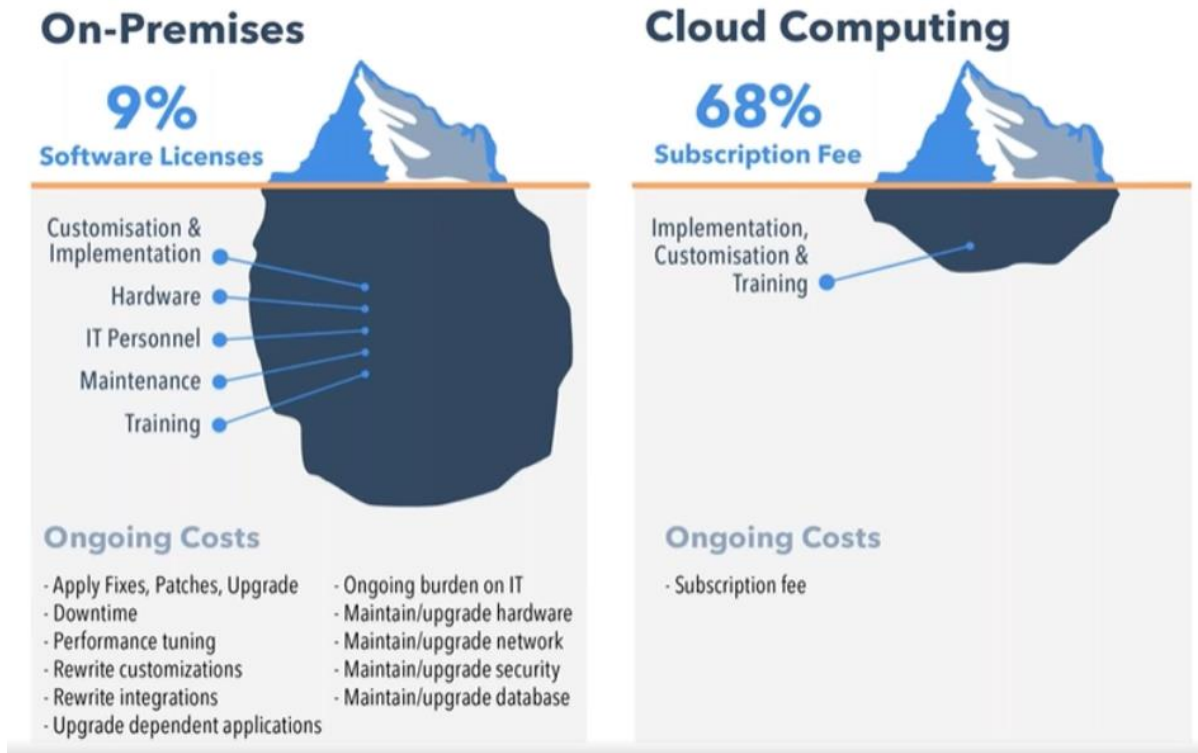
- **Security:** Cloud computing raises security concerns as data is stored in third-party servers, which may be vulnerable to cyber attacks.
- **Dependence on Internet:** Access to cloud storage is entirely dependent on the availability of an internet connection. In case of a network outage, users may not be able to access data.
- **Data Privacy:** Cloud storage providers may have access to user data, which raises concerns about data privacy and confidentiality.
- **Lack of Control:** Cloud users have limited control over the storage infrastructure and the security protocols used by cloud providers.

3.2.2 On-Premise Storage**Pros**

- **Security:** On-premise storage provides greater control over data security as the data is stored within the organization's own network.
- **Control:** On-premise storage gives users complete control over the storage infrastructure, security protocols, and access management.
- **Compliance:** Certain industries require strict compliance regulations, which can be better achieved through on-premise storage.
- **Availability:** On-premise storage is not dependent on internet connectivity and can be accessed even in the absence of an internet connection.

Cons:

- **Cost:** On-premise storage requires significant investment in hardware, software, and maintenance costs.
- **Scalability:** On-premise storage may not be as scalable as cloud storage, and may require additional investment to scale up or down the resources.
- **Complexity:** On-premise storage requires specialized IT expertise for maintenance and troubleshooting.
- **Disaster Recovery:** On-premise storage requires the development of an in-house disaster recovery plan, which may be costly and time-consuming



4 Conclusion and Future Work

Based on earlier studies in the cloud field, general research has been carried out, where a number of characteristics of the cloud environment have been explored and what benefits and drawbacks they can provide. Cloud migration might have negative effects on the organization as a result of a cloud stakeholder's incapability, including security threats and altered procedures and processes. By removing early-stage risks, the organization may successfully migrate with fewer dangers. We choose to focus on the security of cloud migration from the user perspective to study as the issue of cloud migration is wide. The purpose of the study is to determine how the cloud customer perceives cloud security based on the security concerns of confidentiality, integrity, and availability.

Two questions will be addressed in order to achieve our goal for the study:

- How do customers see cloud security during the migration process in terms of confidentiality, integrity, and availability?
- Which factors should be taken into account from a security standpoint for a successful migration?

5 Literature overview

Between benefits and drawbacks, moving to the cloud improves business productivity and offers various advantages of cloud data storage. Organizations must be aware of the drawbacks of migration, which

might prevent a successful transition to the cloud. Two of the key aspects that influence an organization's decision to move are security and flexibility. Nowadays, businesses opt to retain their private data in a manner that restricts public access.

The research study has made use of pertinent theory to have a better grasp of the cloud. The study decides to concentrate on the security aspect of cloud migration and the general description of cloud facts. The outcomes of the data gathering will then be analyzed using the created literature along with pertinent studies from the study area to come up with various comparisons and conclusions.

As an interpretative study, this research employs a qualitative technique to explore how cloud users perceive the Central Intelligence Agency (CIA) during the migration process. The study of the results in the last chapters, particularly in the discussion chapter, will be made easier by employing this theory.

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