

CLOUD COMPUTING: MODERN WAY OF DATA ACCESS

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ABSTRACT

Cloud computing is the new way to deliver and use enterprise applications—it's becoming the preferred solution for companies extending their infrastructure. When you work with cloud computing, you don't need to install and maintain any software on your own system. Cloud computing is accessing resources from your computer and storing them in a server. A cloud services provider manages the apps and software. Managed by: Cloud Services Provider. Cloud computing resources are scalable and elastic. This means that you do not always need to own more hardware than you need, instead scaling capacity up and down in response to traffic spikes. You can also use your provider's global network to spread your application nearer to end users across the globe, even if it is geographically distant from them. This paper reviews on the concept of cloud computing, its components and how it is benefiting organisations.

Keywords: Cloud Computing, Cloud Data Access, Cloud Security.

Introduction

Cloud computing is a term that means servers are hosted and delivered to you over the internet. There are many different types of cloud computing, but they can generally be divided into three different categories: IaaS, PaaS, and SaaS. Cloud computing primarily refers to computing on remote servers. They can be public or private, but the goal is to supply computing resources or IT services with easy and scalable access. [1]

Cloud computing allows for easier, faster access of data and allows for scalability. Providers come in all shapes and sizes, such as public, hybrid or private. NASA was the first to use the term "cloud computing," but it's earned popularity from its usage in computer diagrams and flow charts. [1]

Cloud computing works by allowing clients to access data and applications remotely over the internet. An internet network connects the front end and the back end, with the back end acting as a repository for data to be accessed by the front end. [2]

Connectivity between the front and back ends is managed by a central server that relies on protocols to exchange data, using both software and middleware. Cloud computing relies on virtualization, which makes it easy to abstract and provision the resources needed. Automation also makes it easier for users to self-serve and keep things running efficiently without direct intervention from customer service representatives. [2]

Cloud Computing Types

Cloud computing can be divided into different categories depending on how it will be used. These include Utility, Software as a Service (SaaS), and Platform as a Service (PaaS).

- **IaaS:** IaaS providers let you run and configure virtual machines. Amazon Web Services lets users store data in a server and have a virtual blocker that is configured to suit their needs. IaaS providers offer customers the resources they need: size, storage, and computing power. AWS provides upfront instance pricing that includes long-term commitments and hourly rates.

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Work done in Field of IaaS

X. Liu, et al. 2021, An automated performance benchmarking platform will be released that allows you to install, configure and execute benchmarking tools with ease. This platform can visualize multidimensional data to reveal data like the performance of IaaS Cloud platforms. To test benchmarking system, the authors also rented four IaaS VMs from AliCloud-Beijing, AliCloud-Qingdao, UCloud and Huawei. The performance of these VMs was compared. Complex applications might not depend on one performance parameter, but could depend on many parameters. For example, we ran a TPC-C test to see how MySQL performs in an application scenario. Different parameters might affect the performance of the application under different conditions. [3]

In **2020, A. Augustus Devarajan and T. Sudalai Muthu** offer the De-Duplication Compression (DDC) algorithm as a way to reduce storage space and bandwidth for SoS through the elimination of duplicate files. The metadata standards classify the file data into its respective object. The file's content is then organized into segments of similar files known as bins. Your future access patterns are linked to different parameters to understand your storage needs. The system has experimented with the environment with different parameter simulations to determine file operation ranking. It can view the user's access frequency and rank files accordingly. [4]

M. K. Gupta and T. Amgoth, 2019 With the semi-scheduled context, an algorithm in a virtual machine placement in the IaaS cloud is designed to satisfy resource demands of VMs on a daily basis in real time. Authors followed a modified particle swarm optimization technique called Semi-scheduled Optimized Particle Swarm Optimization (SOPSO) for the placement of servers in the IaaS cloud. This algorithm is better than existing models and outperforms other models when it comes to metrics such as server activeness, power consumption, resource wastage, and number of active servers in the IaaS cloud. [5]

A. Giannakou, et al. 2018, It is a design practice that the security of the cloud customers' infrastructures must be partly monitored by the provider in order to give customer visibility on virtualization. Multi-tenancy and elasticity are features which make it difficult for customer to manage their vulnerabilities. IaaS clouds are frequently reconfigurable, which makes other providers and their security systems unable to detect attacks. [6]

- **PaaS:** Firms provide users access to development tools on their servers, rather than the user hosting them themselves. The user does not need to install or maintain the tools; the firm does that for them. Software development, such as for playbooks, can be hosted on a platform-as-a-service. AWS Elastic Beanstalk and Google App Engine are already used for this.

Work done in Field of PaaS

Z. Wen, et al. 2020 The authors of this study analyzed what the functional architecture and role positioning of a PaaS platform would be with this design. They proposed that physical deployment, resource pools and middleware should be designed in a way to be reliable. Through experimentation, it was determined that this design could function with high availability and be efficient. [7]

C. Zhong and X. Yuan, 2019 In this study, the authors investigated the potential of hour-scheduling models for server loads. An intelligent forecasting model is proposed to schedule resources. The forecasting can be done efficiently, even if there are no historical data available and scaling is easy as well. [8]

M. Klymash, et al. 2019 Authors have found that CDN networks can provide the best service when considering difficult geographic locations of users. The author M. Klymash, et al. 2019 explored their question from an end at point of view. CDN providers are more likely to succeed if CDN has a low loading time for content and the author can also do what is necessary to offer less expensive CDN service. [9]

- **SaaS:** SaaS is a distribution model that delivers software applications. Web services can be accessed anywhere, through any device with internet access. One common SaaS application is Microsoft 365 for productivity and email services.

Cloud Computing Deployment Modals

- **Private Cloud:** Private cloud delivers services from a business's data centre to employees with their own infrastructure. With a private cloud, an organization can build and maintain their own underlying cloud infrastructure. With this model, companies are able to enjoy the benefits of scalable and pay-as-you-go cloud services while still assessing IT users on a charge-back basis. A common private cloud technology provider is VMware and the OpenStack open-source platform. [10]

- **Public Cloud:** Public cloud services are sold on demand, and are often priced per minute or hour. Long-term commitments for these services are also available. Leading public CSPs include AWS, Microsoft Azure, IBM and Google Cloud Platform (GCP). This means customers only pay for the resources that are used. Rather than having to buy a set amount at the beginning of the month, your spending is based on how much you use.
- **Hybrid Cloud:** A hybrid cloud is a combination of on-site infrastructure and public cloud computing, which are coordinated. This can allow businesses to run their mission-critical workloads or sensitive data in private, while using the public cloud for workload bursts or spikes in demand. The goal of hybrid cloud is to create a unified environment that can take advantage of an organization's needs for both public and private clouds. ^[10]

Organizations are using a multi-cloud model, which enables them to seamlessly move an application from one cloud to another. To avoid the risk of an outage, organizations may choose to adopt a multi-cloud. Challenges arise through implementation and application development due to the differences in providers' services and APIs.

Open industry initiatives will help enable multi-cloud deployments as providers' services and APIs become more standardized and easier to use. A community cloud, shared by several organizations that share a common concern, aims to support communities on the same topic. Community clouds can be managed by these organizations or third-parties and if they are on or off premises. ^[11]

Cloud Computing Benefits

The cloud computing offers the following benefits,

- **Speed:** With IT resources on the cloud, you can create a product or service and be prepared to hit the market much faster. Instantly, your product is ready for production at the same time as it's available to get from the cloud.
- **Cost:** Prior to the cloud, it was difficult to plan and buy hardware that met your needs because if you were wrong in your purchase, you could be stuck with it. For example, if the host has already started a cycle of photos when you release their server for a better configuration, then you'd need to sacrifice your old photos, which you wouldn't want to do. However, cloud infrastructure eliminates this risk by not requiring any purchase of hardware. ^[12]
- **Scalability:** With cloud technology, you can easily set up an automated monitoring tool that will supply you with information on the work that needs to be done, then adjust according to what's really needed.
- **Accessibility:** Cloud computing means that you can do anything on the internet, as long as you are connected to it. If you are not connected to the internet for any reason, there are tools that will let you access it at any time. ^[13]
- **Better Security:** Having a secured, durable place to store your data is important for all businesses. The cloud provides highly secure storage for companies' users' data, making it accessible anytime and anyplace that it is required. All of these things are made possible due to the encryption and security of data being stored in the cloud so that it cannot be tampered with. ^[14]

Conclusion

A lot of the workforce is expected to be cloud based by 2023. The majority of non-cloud apps are also expected to flow into the cloud during this time. Moving to the cloud presents many benefits such as scalability and storage space. The future of cloud services looks bright with endless possibilities.

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