

Mohmmadazhar Khalifa

04/13/2022

Mobile Apps II

Term Paper 1I

Basics of Cloud Computing: Exploring its Benefits and Limitations

Abstract: The purpose of this paper is to provide insight on what cloud computing is, what are some key factors that are associated with it as well as the main advantages and disadvantages of using cloud computing technology. Companies are adapting to this technology. This topic is important because companies around the world are adapting to this technology. This technology is pertinent to this class because our phones and many apps offer cloud to its users so they can gain easy access to data across multiple devices. As mentioned in the paper, our phones use cloud storage so that data backups and photo backups can take place in case the user breaks, loses, or would like to access that data with a different device.

The term “cloud computing” refers to the delivery of computing services such as applications, storage, databases, networking, and software analytics over the internet with pay as you go pricing. The name was coined in the early 2000s, where the cloud portion of the word refers to the servers that are retrieved over the internet and the software and databases that run on those servers. Cloud servers are located in data centers all over the world. Some of the services that cloud computing is implemented in are the backup of photo libraries on smartphones, Gmail, and even Netflix (Ranger, 2022). As cloud computing becomes more popular, few different models and deployment strategies have emerged to help meet specific needs of different users. Each type of cloud service and deployment method provides you with a different level of control,

flexibility and management. Understanding the differences between deployment models, and which deployment strategies you can use, helps you decide which set of services is right for your needs (Amazon Web Services). The three main service models are Infrastructure as Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). The three major deployment methods include on-premises or private, public, and hybrid. Some of the benefits of cloud computing include expense cutdown, scalability, and mobility. While some drawbacks include the service being vulnerable to attacks, being internet dependent, and running into downtimes.

The first service model IaaS contains the fundamental components of cloud computing. It gives users access to data storage space, networking capabilities, and computers, whether they be virtual or on dedicated hardware. IaaS customers use the hardware through an internet connection with pay as you go basis. As such the service providers host, manage and maintain the hardware and computing resources at their own data centers. It also provides the most control and freedom over IT resources (IBM Cloud Education, 2021). Examples of IaaS providers include DigitalOcean, Google Compute Engine, and OpenStack (Cloudflare). The second model, PaaS, removes the need for organizations to oversee the underlying infrastructure like hardware and operating systems. The cloud service providers host, manage, and maintain all of the hardware and software in the platform. Servers, OS software, storage, networking, databases, frameworks, security services, OS and software upgrades are all managed by the provider (IBM Cloud Education, 2021). With this model, companies can focus on the deployment of applications and developers do not have to don't have to worry about resource procurement, capacity planning, software maintenance, and patching (Amazon Web Services). Examples of PaaS solutions include AWS Elastic Beanstalk, Google App Engine, Microsoft Windows Azure,

and Red Hat OpenShift on IBM Cloud. The third model SaaS, also called aloud application services is a ready to use software application that is run and managed by the provider. The SaaS providers host and manage the application and all of the infrastructure needed to deliver the application such as the servers, storage, middleware, networking and data storage. The provider also manages all patches and upgrades to the software. The users pay a monthly or annual fee to use the application on a web browser, desktop application or mobile app. Examples of SaaS applications include, Email, social media, and cloud file storage solutions, such as Dropbox or Box (IBM Cloud Education, 2021).

The cloud deployment defines where the servers are and who manages them. Based on ownership, scale, access and purpose of the cloud, a specific type of cloud environment is created. The model also determines the relationships between the infrastructure and the users. (GeekforGeeks, 2021). The three deployment models that this paper will discuss are the public, private, and hybrid models, but there are others such as multi-cloud, community cloud, polycloud, distributed cloud, and big data cloud. A public cloud is a service provided by a vendor that includes servers located in one or more data centers. Public clouds, unlike private clouds, are shared by different enterprises. Individual servers can be shared by many firms using virtual machines, a circumstance known as "multitenancy," because multiple tenants are renting server space on the same server (Cloudflare). The private cloud deployment model is the opposite of the public cloud deployment model. It is a one-on-one environment for a single user. Unlike the public model, there is no need to share your hardware with anyone else. Also called an "internal cloud", the private cloud has the ability to access systems and services within a given organization. It is executed in a cloud-based secure environment that is protected by firewalls and supervised by the organization's IT department. The private offers greater

flexibility of control over cloud resources. Bridging the public and private worlds, the hybrid cloud gives the best of both worlds. This hybrid solution allows companies to use some of their hardware while using the public cloud. Critical applications with sensitive data are run on on-premises while the rest is in the public cloud. This enables a safe environment while taking advantage of the public cloud's cost savings. Organizations can move data and applications between different clouds using a combination of two or more cloud deployment methods, depending on their needs (GeeksforGeeks, 2021).

With more and more companies transitioning towards cloud computing, it helps to weigh some of the benefits and limitations of its services. By implementing cloud computing, it reduces the upfront costs of purchasing hardware and software as well as the cost of building and running onsite data centers. It also means cutting expenses of server racks, continuous electricity for power and of hiring IT experts to manage the structure. Without the need to maintain hardware setup and software patching, IT teams can work on achieving other goals for the company. Cloud also supports scalability since companies' IT requirements vary. For example a large corporation will not have the same bandwidth or cloud capacity needed as a start-up. As such, cloud computing allows for a quick transition of either scaling up or down depending on business demands without having to invest in physical equipment (Microsoft Azure). One of the key aspects of cloud computing is its mobility which allows resources to be easily stored, retrieved, or recovered within seconds. Users are able to gain access to work via any device and in any corner of the world as long as there is internet access. Internet access is critical to accessing the cloud, as all the applications and data are delivered via the internet. This is one of the biggest limitations of using cloud computing. Also, along with a reliable internet, a company should have a fast connection and bandwidth to get the best of cloud computing. Since data is stored in

the cloud, the company's data is online, making it vulnerable to information theft. Even with advanced security measures, confidential information in the cloud can still be a target for cyberattacks. Lastly, a downtime can occur when the providers are facing a technical outage from loss of power, maintenance, or low internet connectivity. This can hinder the user from gaining access to the cloud temporarily. This can be a serious issue depending on how heavily the company is reliant on cloud, as well as the size of the company (Intellipaat, 2022).

This paper discussed the concept of cloud computing, and the basics of the different service and deployment models offered in our current market. By utilizing cloud computing, individuals and companies are able to access applications and data from remote servers located on data centers all over the world. By having accessible internet, users can take advantage of using the providers hardware and even software without needing to invest in infrastructure within the company. The three services models which define which type of service will be provided by the vendor, are IaaS, PaaS, and SaaS. The IaaS hosts the infrastructure on either public or private cloud instead of an on-premise data center. The infrastructure is delivered to users on demand on a pay-as-you go basis. In the case of PaaS, the provider hosts both hardware and software on its own infrastructure. As such components like OS, middleware, and other runtimes are incorporated into the environment, Lastly, SaaS provides a completed software, so the user is able to login and use applications that run on the provider's infrastructure. SaaS providers manage all of the underlying IT resources and manage the application workload. The deployment models discussed are public, private and hybrid clouds, where each is unique based on the relationship between the infrastructure and users. In the public cloud, a single server can be used by multiple users whereas in a private cloud which only the specific organization can have access to. In between those two models, is the hybrid cloud, which combines public cloud

where data that is non confidential can be stored and the private cloud, where sensitive data is stored on premises. Some of the benefits gained by using cloud computing are cost cutdown, scalability, and mobility. As with every technology, some of the limitations of cloud computing include vulnerability to attacks, internet dependency, and downtimes. Cloud computing can be a great option for large companies and even for start-ups and with the future looking bright with new innovations to come.

Resources

Cloud deployment models. GeeksforGeeks. (2021, July 14).

<https://www.geeksforgeeks.org/cloud-deployment-models/>

IBM Cloud Education, I. B. M. C. E. (2021, September 2). IaaS vs. PaaS vs. SaaS. IBM.

<https://www.ibm.com/cloud/learn/iaas-paas-saas#:~:text=IaaS%2C%20PaaS%20and%20SaaS%20are,or%20cloud%20computing%20service%20models>

Ranger, S. (2022, February 25). What is cloud computing? everything you need to know about the cloud explained. ZDNet. <https://www.zdnet.com/article/what-is-cloud-computing-everything-you-need-to-know-about-the-cloud/>

Top 10 advantages and disadvantages of cloud computing [2022]. Intellipaat Blog. (n.d.).

<https://intellipaat.com/blog/tutorial/amazon-web-services-aws-tutorial/advantages-and-disadvantages-of-cloud-computing/>

Whats is cloud computing? AWS. Amazon Web Services. (n.d.). [https://aws.amazon.com/what-is-cloud-computing/#:~:text=Infrastructure%20as%20a%20Service%20\(IaaS,\)%2C%20and%20data%20storage%20space](https://aws.amazon.com/what-is-cloud-computing/#:~:text=Infrastructure%20as%20a%20Service%20(IaaS,)%2C%20and%20data%20storage%20space)

What is cloud? | Cloud definition. Cloudflare. (n.d.). <https://www.cloudflare.com/learning/cloud/what-is-the-cloud/#:~:text=%22The%20cloud%22%20refers%20to%20servers,centers%20all%20over%20the%20world>

What is cloud computing? A beginner's guide: Microsoft azure. What Is Cloud Computing? A Beginner's Guide | Microsoft Azure. (n.d.). <https://azure.microsoft.com/en-us/overview/what-is-cloud-computing/>