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CLOUD INFRASTRUCTURE SERVICE DELIVERY SPECIFICS

Abstract. The article discusses infrastructure as a service. Cloud infrastructure includes at least basic computing resources, data storage, and network resources. Infrastructure as a service provides benefits that allow various systems to develop faster and achieve their digital transformation goals. Such deployment options for cloud systems as private cloud, public cloud, and hybrid cloud are explored. Each type of cloud has its own disadvantages and advantages. Infrastructure as a service provides four main benefits that allow various systems to develop faster and achieve their digital transformation goals. The next generation cloud is designed to run any application faster and more securely at a lower cost.

Keywords: cloud infrastructure, cloud computing, hybrid cloud.

Introduction

Infrastructure as a Service (IaaS) is a cloud computing service model where computing resources are hosted in a public cloud, private cloud, or hybrid cloud. With the IaaS model, it is possible to partially or completely move an on-premises or distributed data center infrastructure to the cloud, where it is maintained and managed by a cloud provider [1–4].

Such infrastructure elements may include computing, networking, storage hardware, and other components and software [5, 6]. A standard IaaS model uses various services, such as computing, storage, and databases, provided by a cloud provider. The service provider delivers these services by hosting hardware and software in the cloud.

The company does not need to purchase its own hardware, administer it, or allocate space for it in its data centers [7–10]. And it bears the costs on a pay-as-you-go basis. If the company needs fewer resources, the overall cost for them decreases. And as a company grows, it can provide employees with additional computing resources and other technologies in minutes.

Basic material

Cloud infrastructure includes, at a minimum, the core compute, storage, and network resources. More recently, it has also come to include higher-level services (sometimes called platform as a service [PaaS]), such as relational and NoSQL databases, real-time and bulk processing, developer pipelines and services, containers, and tooling. Unlike software as a service (SaaS), IaaS is not intended for the average end user.

IaaS is intended for [11]:
– application developers;
– IT operators;
– DevOps teams;
– systems and database administrators;
– general developers.

The cloud improves operational efficiency, quickly deploys IT services, and transforms workflows. Cloud deployments have proven useful in everything from financial reporting and supply chains to simple mobile applications. Each of the three common cloud computing models has its own unique characteristics that help solve business problems in a specific way [12–14].

The line between IaaS and PaaS is blurring because cloud solutions often offer both models in the same environment. IaaS helps you spend more efficiently on hardware and devices, while PaaS allows you to further reduce administrative costs and expand your use cases with less hardware.

Infrastructure as a Service provides four key benefits that enable various systems to evolve faster and achieve their digital transformation goals.

Cloud infrastructure reduces the time and cost of provisioning and scaling the environments needed to develop, test, and use off-the-shelf systems. It allows you to use computing services on demand, while IaaS allows you to scale your infrastructure as needed. IaaS allows the use of new, improved equipment and various services [15, 16].

The IaaS model is available in most regions of the world, and the data centers themselves are located in densely populated areas.

Compared to on-premises systems, IaaS provides higher uptime, redundancy implemented at every tier, improved security and disaster recovery options, and scalability that on-premises environments cannot.

IaaS is gaining popularity across all industries, and its user base is growing.

The cloud infrastructure user base generally consists of IT systems operators, application developers, DevOps teams, systems and database administrators, and general developers [17].

IaaS provides numerous advantages over traditional on-premises data centers. Table 1 summarizes the capabilities that IaaS provides.

Discussion and Results

The next generation cloud designed to run any application faster and more securely at a lower cost.

The OCI distributed cloud provides freedom to choose the method and way to allocate cloud services, ensuring their compliance with regulatory requirements, performance, and other needs.

There are several options for deploying cloud systems (Fig. 1):

1. *Private cloud*. Used to provide services within a single company, which is both a customer and a service provider. A private cloud is an IT model that involves placing all virtual resources on a physical server.

Table 1 – **IaaS Features and Benefits**

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Development and testing	With IaaS, you can create and tear down test and development environments quickly and at a low cost, reducing the time to market for new applications.
Traditional applications	IaaS supports both cloud and native applications, including ERP and business intelligence applications.
Hosting websites and web applications	IaaS also supports web and mobile applications that can be quickly deployed and scaled.
Storage, backup and recovery	Storing and backing up data on-premises, as well as planning and executing disaster recovery, requires significant time and expertise. Moving infrastructure to the cloud helps reduce costs and free up time for other tasks.
High Performance Computing	With a pay-as-you-go model, IaaS makes high-performance computing and other data-intensive project-oriented workloads more accessible.
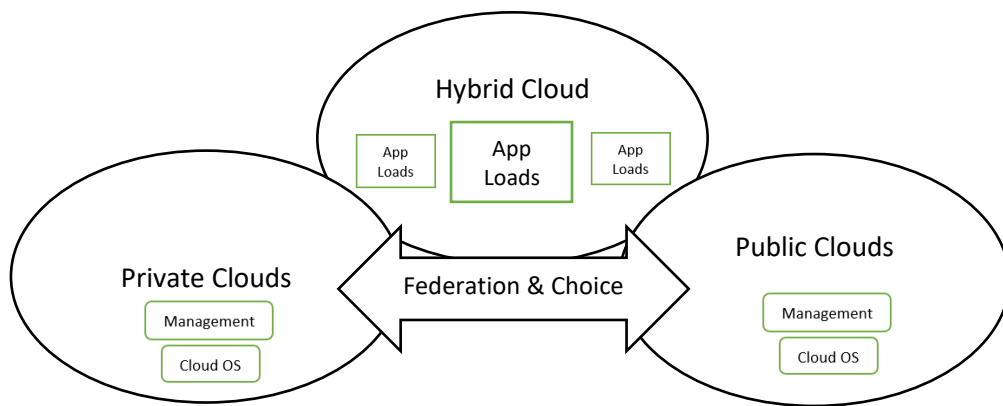
Fig. 1. Cloud Systems

2. ***Public cloud***. Used by cloud providers to provide services to external customers. A public cloud is the most accessible and popular way to store data. When using this model, company information is stored in a large provider cloud along with data from other companies, but it is isolated and protected from outside access.

3. ***Mixed (hybrid) cloud*** is a symbiosis of the first two models, i.e. some IT resources of the company are located in a private cloud, others in a public one. This approach, especially with the use of hyperconvergent systems, provides both cost reduction due to the use of the public model and a high level of security in private.

When the demand for computing and data processing starts to exceed the capacity of the on-premises data center resources, it becomes necessary to use the cloud to quickly scale performance. Hybrid cloud infrastructure, which includes multiple public clouds from multiple cloud service providers, combines best-in-class cloud services offered by multiple cloud service providers.

The main objective of hybrid cloud and cloud integration is to facilitate the creation of new systems of participation in the cloud with their on-premises systems in a secure and reliable manner. Cloud integration helps to protect data in their old systems by securely integrating cloud applications and data with on-premises ones.

Hybrid cloud supports the widest range of cloud strategies. Hybrid cloud platforms provide the flexibility to choose infrastructure based on their workload needs, compliance, and latency requirements. A hybrid cloud consists of one or more private clouds. A critical component of a hybrid cloud that significantly improves its usability is a cloud resource management platform that allows you to use all connected clouds, both private and public, in a single interface. Without such a platform, each private and public cloud must be managed separately, which significantly increases the administration costs. At the same time, the best platforms have the functionality to issue recommendations to improve the efficiency of cloud environments by 30-50% by analyzing cloud use cases.

Conclusions

Cloud computing provides advanced computing resources that are available on-demand, scale on demand, and receive regular updates without the need to purchase and maintain on-premises infrastructure. Each type of cloud - public, private, hybrid - has its own disadvantages and advantages.

Significant benefits of a hybrid cloud are also highlighted, such as managing growing data volumes and reducing storage costs by 60%, optimizing storage and data management, and better recovery from

failures. One of the key trends in the future development of cloud services is the widespread use of artificial intelligence and machine learning. Cloud services will work with these technologies to create intuitive and automated solutions that will help companies perform their tasks faster and more efficiently. Another area of cloud service development will be the use of IoT (Internet of Things) and smart devices. Cloud services will provide the infrastructure for processing and analyzing data received from smart devices. This will help make decisions faster and more accurately based on data received from multiple sources.

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Особливості надання хмарних інфраструктурних послуг

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Анотація. У статті розглядається інфраструктура як послуга. Хмарна інфраструктура включає принаймні базові обчислювальні ресурси, сховище даних і мережні ресурси. Інфраструктура як послуга надає переваги, які дозволяють різноманітним системам розвиватися швидше та досягати цілей цифрової трансформації. Досліджено такі варіанти розгортання хмарних систем, як приватна хмара, публічна хмара та гібридна хмара. Кожен тип хмари має свої недоліки та переваги. Інфраструктура як послуга забезпечує чотири основні переваги, які дозволяють різним системам розвиватися швидше та досягати цілей цифрової трансформації. Хмара наступного покоління розроблена для того, щоб запускати будь-яку програму швидше та безпечніше за меншу вартість.

Ключові слова: хмарна інфраструктура, хмарні обчислення, гібридна хмара.