Cloud Computing
The Power of Resource Sharing

AWS the Use Case

About this Presentation

Cloud Computing and Different Cloud Provider Comparison –
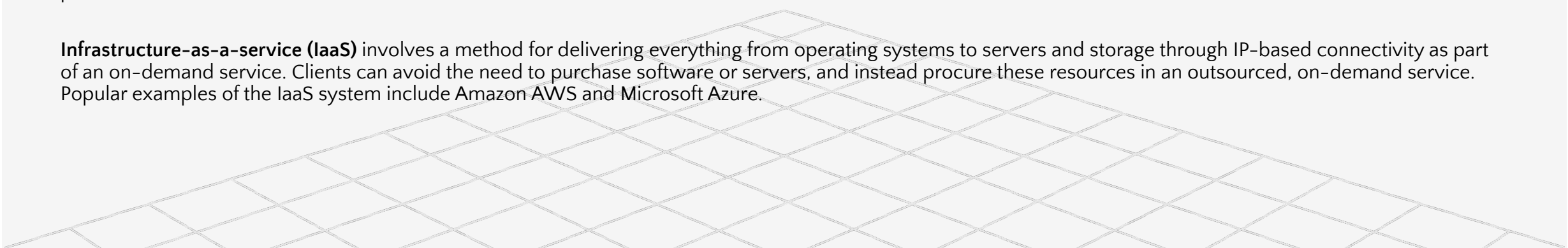
By : (Pravesh Kumar)

Definition of Cloud Computing

Cloud Computing : It is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Types of Cloud Computing are : –

Software-as-a-service (SaaS) involves the licensure of a software application to customers. Licenses are typically provided through a pay-as-you-go model or on-demand. This type of system can be found in Microsoft Office's 365.

Platform-as-a-service (PaaS) is considered the most complex of the three layers of cloud-based computing. PaaS shares some similarities with SaaS, the primary difference being that instead of delivering software online, it is actually a platform for creating software that is delivered via the Internet. This model includes platforms like Force.com and Heroku.

Infrastructure-as-a-service (IaaS) involves a method for delivering everything from operating systems to servers and storage through IP-based connectivity as part of an on-demand service. Clients can avoid the need to purchase software or servers, and instead procure these resources in an outsourced, on-demand service. Popular examples of the IaaS system include Amazon AWS and Microsoft Azure.

Why Use Cloud Resource?

Advantages of Cloud Computing

- Cloud-based software offers companies from all sectors a number of benefits, including the ability to use software from any device either via a native app or a browser. As a result, users can carry their files and settings over to other devices in a completely seamless manner.

- Cloud computing is far more than just accessing files on multiple devices. Thanks to cloud computing services, users can check their email on any computer and even store files using services such as Dropbox and Google Drive. Cloud computing services also make it possible for users to back up their music, files, and photos, ensuring those files are immediately available in the event of a hard drive crash.

- It also offers big businesses huge cost-saving potential. Before the cloud became a viable alternative, companies were required to purchase, construct, and maintain costly information management technology and infrastructure. Companies can swap costly server centers and IT departments for fast Internet connections, where employees interact with the cloud online to complete their tasks.

Disadvantage Of Cloud Computing

- Security has always been a big concern with the cloud especially when it comes to sensitive medical records and financial information. While regulations force cloud computing services to shore up their security and compliance measures, it remains an ongoing issue. Encryption protects vital information, but if that encryption key is lost, the data disappears.

- Servers maintained by cloud computing companies may fall victim to natural disasters, internal bugs, and power outages, too. The geographical reach of cloud computing cuts both ways: A blackout in California could paralyze users in New York, and a firm in Texas could lose its data if something causes its Maine-based provider to crash.

- Learning Curve Challenges.

Cloud Architecture

Deployment Models

There are various types of clouds, each of which is different from the other. Public clouds provide their services on servers and storage on the Internet. These are operated by third-party companies, who handle and control all the hardware, software, and the general infrastructure. Clients access services through accounts that can be accessed by just about anyone using network connection.
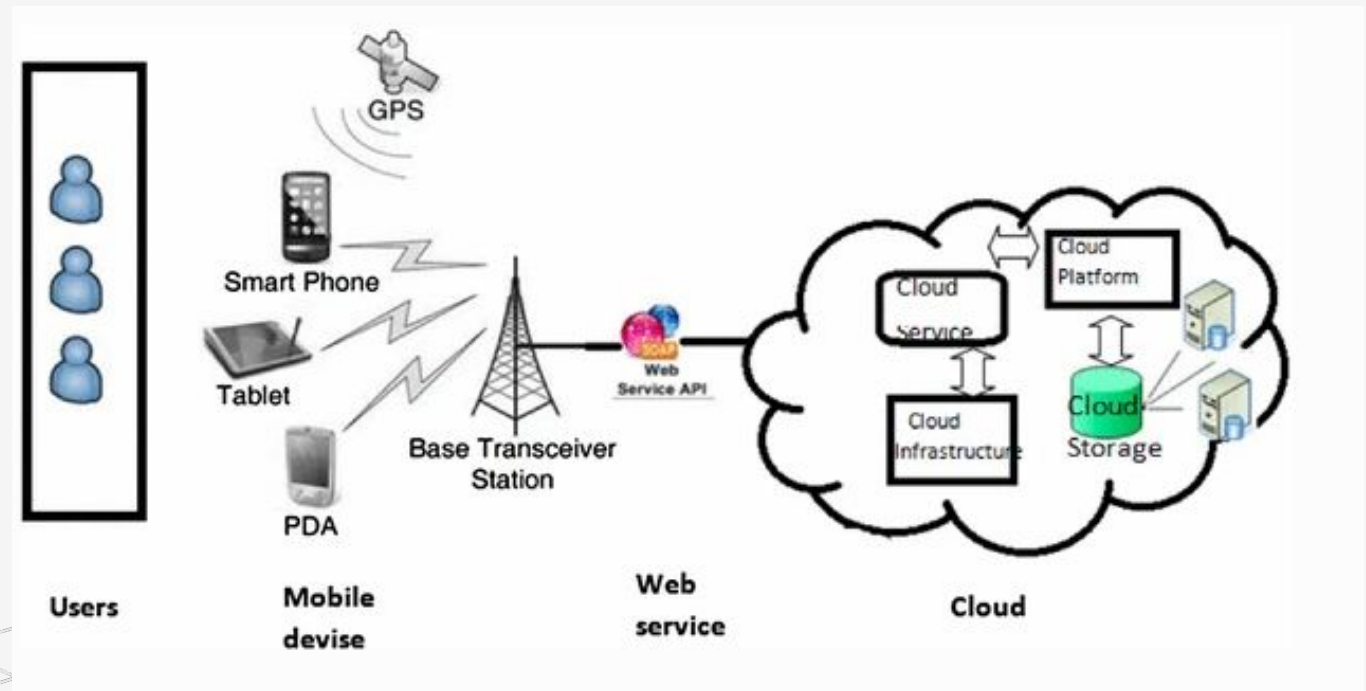
AWS vs Azure vs Google Cloud : Compute

Amazon AWS	Microsoft Azure	Google Cloud
EC2	Virtual Machines	Compute Engine
Elastic Container Service	Virtual Machine Scale Sets	Kubernetes
Elastic Container Service for Kubernetes	Azure Container Service (AKS)	Functions
LightSail	Container Instances	Container Security
Batch	Batch	Graphics Processing Unit (GPU)
Elastic Beanstalk	Service Fabric	App Engine
Fargate	Cloud Services	Knative
Auto Scaling		
Elastic Load Balancing		
VMware Cloud on AWS		

Compute Services : AWS

Elastic Compute Cloud: Amazon's flagship compute service is Elastic Compute Cloud, or EC2. Amazon describes EC2 as "a web service that provides secure, resizable compute capacity in the cloud." EC2 offers a wide variety of options, including a huge assortment of instances, support for both Windows and Linux, bare metal instances, GPU instances, high-performance computing, auto scaling and more. AWS also offers a free tier for EC2 that includes 750 hours per month for up to twelve months.

Container services: Within the compute category, Amazon's various container services are increasing in popularity, and it has options that support Docker, Kubernetes, and its own Fargate service that automates server and cluster management when using containers. It also offers a virtual private cloud option known as Lightsail, Batch for batch computing jobs, Elastic Beanstalk for running and scaling Web applications, as well as a few other services.

Compute Services : Microsoft

Virtual Machines: Microsoft's primary compute service is known simply as Virtual Machines. It boasts support for Linux, Windows Server, SQL Server, Oracle, IBM, and SAP, as well as enhanced security, hybrid cloud capabilities and integrated support for Microsoft software. Like AWS, it has an extremely large catalog of available instances, including GPU and high-performance computing options, as well as instances optimized for artificial intelligence and machine learning. It also has a free tier with 750 hours per month of Windows or Linux B1S virtual machines for a year.

Additional Services: Azure's version of Auto Scaling is known as Virtual Machine Scale Sets. And it has two container services: Azure Container Service is based on Kubernetes, and Container Services uses Docker Hub and Azure Container Registry for management. It has a Batch service, and Cloud Services for scalable Web applications is similar to AWS Elastic Beanstalk. It also has a unique offering called Service Fabric that is specifically designed for applications with microservices architecture.

Compute Services : Google

Compute Engine: By comparison, Google's catalogue of compute services is somewhat shorter than its competitors'. Its primary service is called Compute Engine, which boasts both custom and predefined machine types, per-second billing, Linux and Windows support, automatic discounts and carbon-neutral infrastructure that uses half the energy of typical data centres. It offers a free tier that includes one f1-micro instance per month for up to 12 months.

Focus on Kubernetes: Google also offers a Kubernetes Engine for organizations interested in deploying containers. Like all of the leading cloud vendors, it's set up to offer containers and microservices. And it's worth noting that Google has been heavily involved in the Kubernetes project, giving it extra expertise in this area.

AWS vs Azure vs Google Cloud : Storage

Amazon AWS	Microsoft Azure	Google Cloud
Simple Storage Service (S3)	Blob Storage	Cloud Storage
Elastic Block Storage (EBS)	Queue Storage	Persistent Disk
Elastic File System (EFS)	File Storage	Transfer Service
Database Services		
Aurora	SQL Database	Cloud SQL
RDS	Cosmos DB	Cloud Bigtable
DynamoDB	Data Factory	Cloud Datastore
Backup Services		
Glacier	Archive Storage	
	Site Recovery	
	Backup	

Storage Services : AWS

SSS to EFS: AWS offers a long list of storage services that includes its Simple Storage Service (S3) for object storage, Elastic Block Storage (EBS) for persistent block storage for use with EC2, and Elastic File System (EFS) for file storage. Some of its more innovative storage products include the Storage Gateway, which enables a hybrid storage environment, and Snowball, which is a physical hardware device that organizations can use to transfer petabytes of data in situations where Internet transfer isn't practical.

Database and archiving On the database side, Amazon has a SQL-compatible database called Aurora, Relational Database Service (RDS), DynamoDB NoSQL database, ElastiCache in-memory data store, Redshift data warehouse, Neptune graph database and a Database Migration Service. Amazon offers Glacier, which is designed for long-term archival storage at very low rates. In addition, its Storage Gateway can be used to easily set up backup and archive processes.

Storage Services : Microsoft

Storage Services: Microsoft Azure's basic storage services include Blob Storage for REST-based object storage of unstructured data, Queue Storage for large-volume workloads, File Storage and Disk Storage. It also has a Data Lake Store, which is useful for big data applications.

Extensive Database: Azure's database options are particularly extensive. It has three SQL-based options: SQL Database, Database for MySQL and Database for PostgreSQL. It also has a Data Warehouse service, as well as Cosmos DB and Table Storage for NoSQL. Redis Cache is its in-memory service and the Server Stretch Database is its hybrid storage service designed specifically for organizations that use Microsoft SQL Server in their own data centres. Unlike AWS, Microsoft does offer an actual Backup service, as well as Site Recovery service and Archive Storage.

Storage Services : Google

Unified Storage and more: As with compute, GCP has a smaller menu of storage services available. Cloud Storage is its unified object storage service, and it also has a Persistent Disk option. It offers a Transfer Appliance similar to AWS Snowball, as well as online transfer services.

SQL and NoSQL When it comes to databases, GCP has the SQL-based Cloud SQL and a relational database called Cloud Spanner that is designed for mission-critical workloads. It also has two NoSQL options: Cloud Bigtable and Cloud Datastore. It does not have backup and archive services .

The Other Services Category Provide by Diff Platforms are:

Regions	Batch Processing	In-Memory Database	Content Delivery
NoSQL Database	Object Storage	Archive/Backup	Big Data Analytics
Pricing	Block Storage	Disaster Recovery	Authentication and Access Management
Basic Compute	File Storage	Machine Learning	Security
Containers	Hybrid Storage	Cognitive Services	Application Lifecycle Management
Serverless	Offline Data Transfer	IoT	Cloud Monitoring
App Hosting	Relational/SQL Database	Networking	Cloud Management
AR & VR	Virtual Private Cloud	Training	Support
3rd Party Software and Services			

References Source:

Reference :
https://aws.amazon.com/training/
https://docs.microsoft.com/en-us/learn/azure/
https://cloud.google.com/training/courses
https://en.wikipedia.org/wiki/Cloud_computing
https://www.datamation.com/cloud-computing/aws-vs-azure-vs-google-cloud-comparison.html