

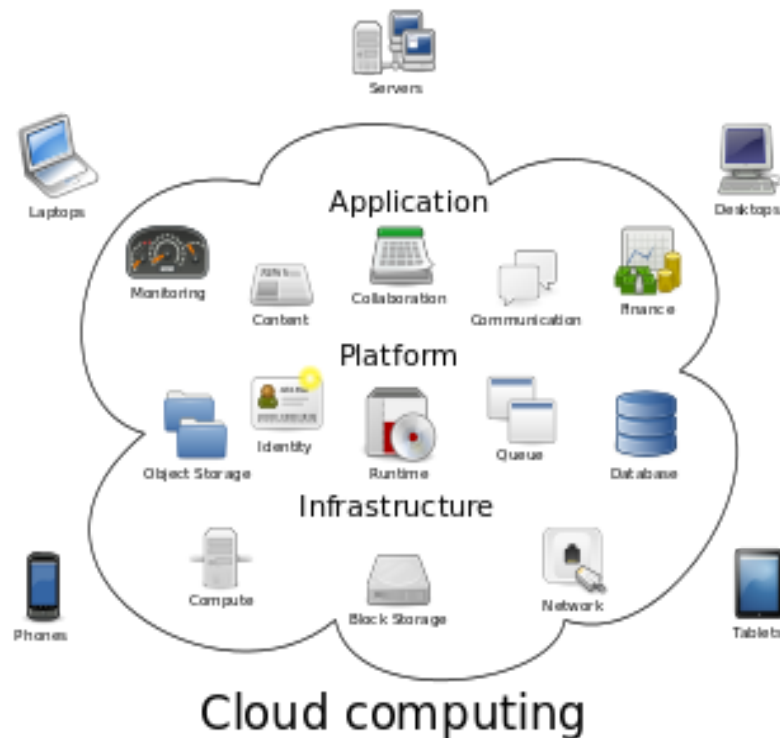
TASK 6:

CLOUD COMPUTING

Comparison between AWS, AZURE, and GOOGLE CLOUD PLATFORM

Introduction: What is Cloud Computing?

Cloud computing is the on-demand delivery of IT resources over the Internet with pay-as-you-go pricing. Instead of buying, owning, and maintaining physical data centers and servers, you can access technology services, such as computing power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS).



What is AWS?

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 175 fully-featured services from data centers globally. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

What is Azure?

Microsoft Azure is an ever-expanding set of cloud services to help your organization meet your business challenges. It is the freedom to build, manage, and deploy applications on a massive, global network using your favorite tools and frameworks.

What is Google Cloud Platform?

Google Cloud Platform (GCP), offered by Google, is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, file storage, and YouTube. Alongside a set of management tools, it provides a series of modular cloud services including computing, data storage, data analytics, and machine learning. Registration requires a credit card or bank account details.

AWS Vs Azure Vs Google Cloud:



Parameters	AWS	Azure	Google Cloud
Date Of Initiation	2006	2010	2008
Market Share	31%	20%	6%
Max IOPS	500	300	3000 read, 1500 writes

Compute Services:

Services	AWS	Azure	GCP
IaaS	Amazon Elastic Compute Cloud	Virtual Machines	Google Compute Engine
PaaS	AWS Elastic Beanstalk	App Service and Cloud Services	Google App Engine
Containers	Amazon Elastic Compute Cloud Container Service	Azure Kubernetes Service (AKS)	Google Kubernetes Engine
Serverless Functions	AWS Lambda	Azure Functions	Google Cloud

Database Services:

Services	AWS	Azure	GCP
RDBMS	Amazon Relational Database Service	SQL Database	Google Cloud SQL
NoSQL: Key-Value	Amazon DynamoDB	Table Storage	Google Cloud Datastore Google Cloud Bigtable
NoSQL: Indexed	Amazon SimpleDB	Azure Cosmos DB	Google Cloud Datastore

Storage Services:

Services	AWS	Azure	GCP
Object Storage	Amazon Simple Storage Service	Blob Storage	Google Cloud Storage
Virtual Server Disks	Amazon Elastic Block Store	Managed Disks	Google Compute Engine Persistent Disks
Cold Storage	Amazon Glacier	Azure Archive Blob Storage	Google Cloud Storage Nearline
File Storage	Amazon Elastic File System	Azure File Storage	ZFS/Avere

Networking Services:

Services	AWS	Azure	GCP
Virtual Network	Amazon Virtual Private Cloud (VPC)	Virtual Networks (VNETs)	Virtual Private Cloud
Elastic Load Balancer	Elastic Load Balancer	Load Balancer	Google Cloud Load Balancing
Peering	Direct Connect	ExpressRoute	Google Cloud Interconnect
DNS	Amazon Route 53	Azure DNS	Google Cloud DNS

AWS vs. Azure vs. Google: Key Cloud Tools

Looking ahead, experts say that emerging technologies like artificial intelligence, machine learning, the Internet of Things (IoT), and serverless computing will become key points of differentiation for the cloud vendors. All three leading vendors have begun experimenting with offerings in these areas and are likely to expand their services in the coming year.

AWS Key Tools:

- **Pagemaker to Serverless:** As in other areas, AWS has the longest lists of services in each of these areas. Highlights include its SageMaker service for training and deploying machine learning models, the Lex conversational interface that also powers its Alexa services, its Greengrass IoT messaging service, and the Lambda serverless computing service.
- **AI and ML:** Among its many AI-oriented services, AWS offers DeepLens, an AI-powered camera for developing and deploying machine learning algorithms to use with things like optical character recognition and image and object recognition. AWS has announced Gluon, an open-source deep-learning library designed to make it easy for developers and non-developers alike to build and quickly train neural networks without having to know AI programming.

Azure Key Tools:

- **Cognitive Services:** Microsoft has also invested heavily in artificial intelligence, and it offers a machine learning service and a bot service on Azure. It also has Cognitive Services that include a Bing Web Search API, Text Analytics API, Faces API, Computer Vision API, and Custom Vision Service. For IoT, it has several management and analytics services, and its serverless computing service is known as Functions.
- **Supporting MSFT Software** Not surprisingly, many of Azure's top tools are geared around supporting on-premises Microsoft software. Azure Backup is a service that links Windows Server Backup in Windows Server 2012 R2 and Windows Server 2016. Visual Studio Team Services hosts Visual Studio projects on Azure.

Google Key Tools:

- **Big on AI:** For Google Cloud Platform, AI and machine learning are big areas of focus. Google is a leader in AI development thanks to TensorFlow, an open-source software library for building machine learning applications. The TensorFlow library

is popular and well regarded. A testament to its popularity is that AWS recently added support for TensorFlow.

- **IoT to Serverless:** Google Cloud has strong offerings in APIs for natural language, speech, translation, and more. Additionally, it offers IoT and serverless services, but both are still in beta previews.

AWS vs. Azure vs. Google: What's Best for You?

Many experts believe that the majority of enterprises will invest heavily in multi-cloud. Indeed, pursuing a multi-cloud strategy may help lessen vendor lock-in or match workloads with the best available service.

The AWS Choice: You can't go wrong with AWS due to its rich collection of tools and services and massive scale. The only reason not to choose Amazon is if you want a more personal relationship, something a small boutique shop can offer. At its size, it's hard for Amazon to have a close relationship with every customer, but there are resellers and consultants who can offer that type of attentive focus

The Azure Choice: Microsoft's greatest appeal is, of course, to Microsoft shops. All of your existing .Net code will work on Azure, your Server environment will connect to Azure, and you will find it easy to migrate on-premises apps. Furthermore, Azure's deep focus on the hybrid cloud will help you bridge the legacy data center environment with the rapidly scalable (and feature-rich) Microsoft cloud.

The Google Choice: Google is growing quickly but is a work in progress. Naturally, the search giant doesn't have a legacy background in dealing with businesses. But it is fully committed and has plowed billions into its cloud efforts. And it is partnered with Cisco, which does know the enterprise. Google has built its cloud on its strength, which is scale and machine learning. It's clearly worth a look.