NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

Introduction To Cloud Platform

Cloud Infrastructure Engineering

Nanyang Technological University & Skills Union - 2022/2023

Course Content

- Quick Check-In
- Dive into the basics of Cloud Providers like AWS & GCP
- Explore the differences between the Cloud Providers
- Explore the products in the Cloud Provider’s Platform

Time	What	How or Why
7:15pm - 7:30pm	Part 1 - Presentation	Introduction To AWS
7:30pm - 7:45pm	Part 2 - Presentation	Introduction To GCP
7:45pm - 7:55pm	Part 3 - Presentation	Compare AWS & GCP
7:55pm - 8:05pm	Break	
8:15pm - 8:55pm	Part 4 - Presentation	Explore AWS Products & Console
8:55pm - 9:00pm	Assignment Briefing	
9:00pm - 10:00pm	Assignment & Wrap Up	

Introduction To Google Cloud Platform

Brief History of GCP

Started in 2008.

In April 2008, GCP released its first service App Engine in preview mode.

Fast forward today, GCP is widely used by major companies like Snapchat, Airbnb, Zillow, Bloomberg, and PayPal.

Competitive Advantage of GCP

Quality of Internal Development Team

Did you know that Google was responsible for creating Kubernetes before donating the project to CNCF?

Competitive Advantage of GCP

Impressive Data Tools

TensorFlow, BigQuery, Cloud IOT, Vertex AI, Vision AI and more

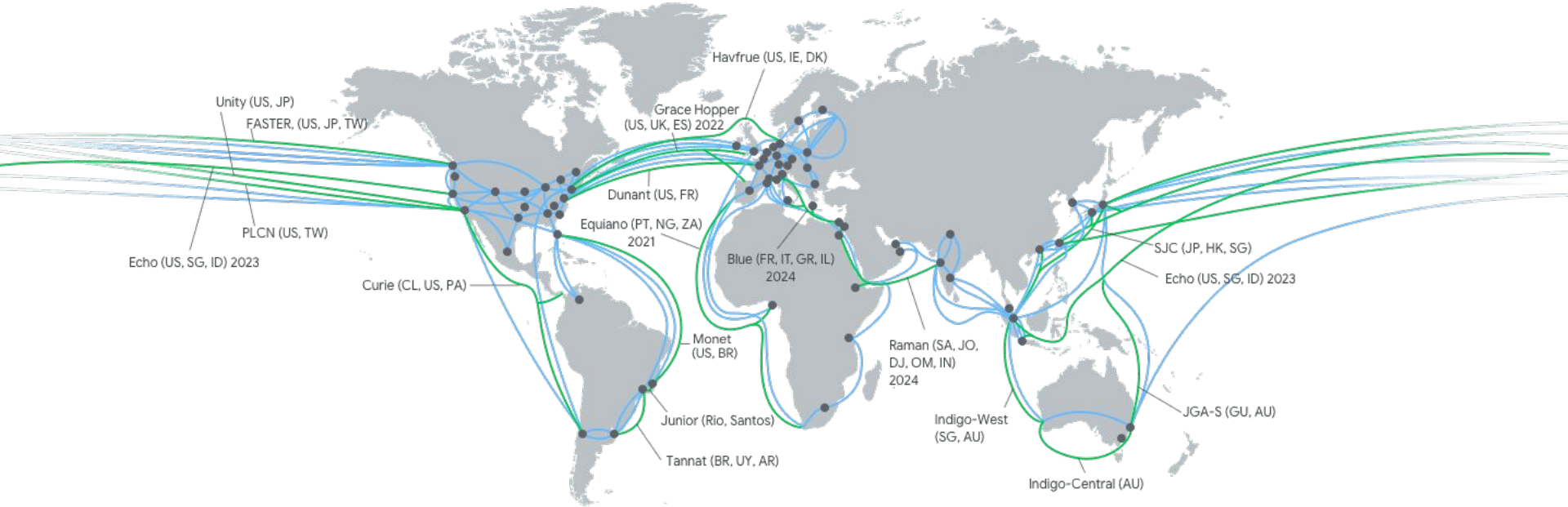
Competitive Advantage of GCP

Powerful Network

Powered by Google’s impressive global connectivity, they boast a strong network across regions.

Competitive Advantage of GCP

Powerful Network



GCP Summed Up

Introduction to Amazon Web Services

Brief History of AWS

AWS was first to market with a **modern cloud infrastructure service** when it launched **Amazon Elastic Compute Cloud (EC2)** in August, 2006.

Since then, they have captured **34% market share** of the Cloud Computing's $200bn industry.

Top customers include Netflix, Pfizer, Walt Disney, Sony, Samsung etc.

Competitive Advantage of AWS

Ease of Use

AWS has made it really easy for any user to get started with their services

Competitive Advantage of AWS

Large Market Share

AWS has been the number 1 cloud provider for many years now.

AWS Summed Up

Introduction to Services

Compute Instances

AWS - **Elastic Compute Cloud (EC2)**

Offers the broadest and deepest compute platform, with over 500 instances and choices for your workloads.

Amazon EC2

GCP **- Compute Engine**

Secure and customizable compute service that lets you **create and run virtual machines** on Google's infrastructure on an IaaS model.

Google Compute Engine

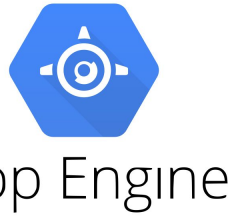
PaaS Offerings

AWS - **Elastic Beanstalk**

Easy-to-use service for deploying and scaling web applications and services developed with any programming languages & docker.

GCP **- App Engine**

App Engine - Standard & Flexible - supports popular development languages with a range of developer tools.



Serverless

AWS - **Lambda**

Serverless, event-driven compute service that lets you run code for virtually any type of application or backend service without provisioning servers.

GCP - **Cloud Functions**

Run your code in the cloud with no servers or containers to manage with our scalable, pay-as-you-go functions as a service (FaaS) product.

Storage - Cloud Storage

AWS - **Simple Storage Solution (S3)**

Object storage service offering industry-leading scalability, data availability, security, and performance

GCP - **Cloud Storage**

Object storage for companies of all sizes. Store any amount of data. Retrieve it as often as you'd like.

Database - Relational

AWS - **Aurora**

Built-in security, continuous backups, serverless RDBMS, up to 15 read replicas, and automated multi-Region replication.

GCP - **Cloud SQL**

Fully managed relational database service for MySQL, PostgreSQL, and SQL Server with rich extension collections, configuration flags, and developer ecosystems.

Cloud SQL

Database - Non-Relational

AWS - **Dynamodb**

Fully managed, serverless, key-value NoSQL database designed to run high-performance applications at any scale.

GCP - **Cloud BigTable**

A fully managed, scalable NoSQL database service for large analytical and operational workloads with up to 99.999% availability.

Containers - Kubernetes

AWS - **Elastic Kubernetes Service (EKS)**

Fully managed Kubernetes service to run Kubernetes in the AWS cloud and on-premises data centers.

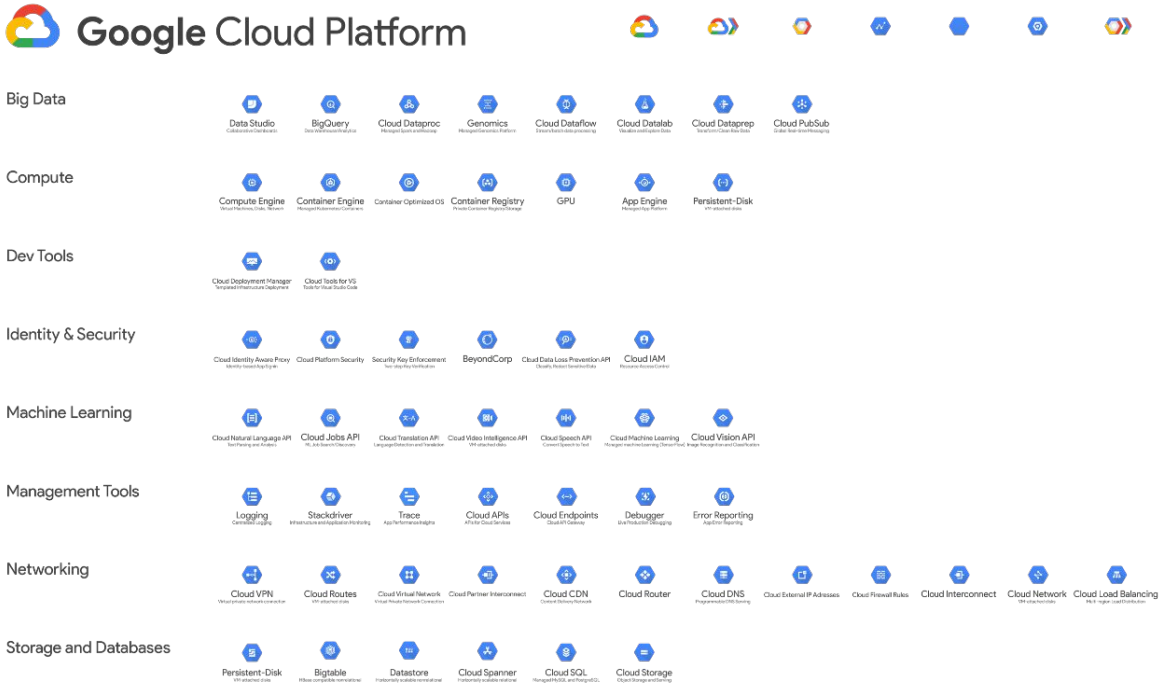
GCP - **Google Kubernetes Service (GKS)**

Industry's first fully managed Kubernetes service with full Kubernetes API, 4-way autoscaling, release channels, and multi-cluster support.

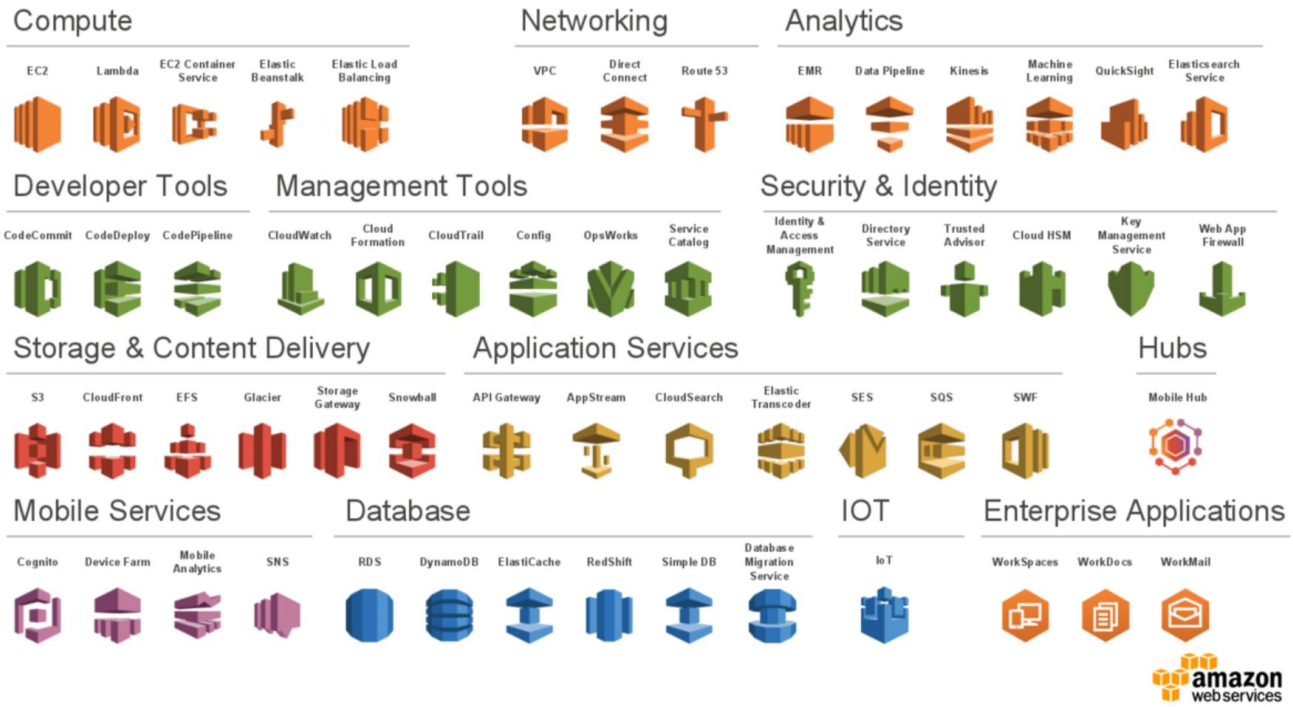
Summary

CLOUD SERVICES	aws		
Virtual Servers	Instances	VM Instances	VMs
Platform-as-a-Service	Elastic Beanstalk	App Engine	Cloud Services
Serverless Computing	Lambda	Cloud Functions	Azure Functions
Docker Management	ECS	Container Engine	Container Service
Kubernetes Management	EKS	Kubernetes Engine	Kubernetes Service
Object Storage	S3	Cloud Storage	Block Blob
Archive Storage	Glacier	Coldline	Archive Storage
File Storage	EFS	ZFS / Avere	Azure Files
Global Content Delivery	CloudFront	Cloud CDN	Delivery Network
Managed Data Warehouse	Redshift	Big Query	SQL Warehouse

Overview


Google Cloud Platform
Big Data
Data Studio
BigQuery
Cloud Dataproc
Genomics
Cloud Dataflow
Cloud Datalab
Cloud Dataprep
Cloud PubSub
Compute
Compute Engine
Container Engine
Container Optimized OS
Container Registry
GPU
App Engine
Persistent-Disk
Dev Tools
Cloud Deployment Manager
Cloud Tools for VS
Identity & Security
Cloud Identity Aware Proxy
Cloud Platform Security
Security Key Enforcement
BeyondCorp
Cloud Data Loss Prevention API
Cloud IAM
Machine Learning
Cloud Natural Language API
Cloud Jobs API
Cloud Translation API
Cloud Video Intelligence API
Cloud Speech API
Cloud Machine Learning
Cloud Vision API
Management Tools
Logging
Stackdriver
Trace
Cloud APIs
Cloud Endpoints
Debugger
Error Reporting
Networking
Cloud VPN
Cloud Routes
Cloud Virtual Network
Cloud Partner Interconnect
Cloud CDN
Cloud Router
Cloud DNS
Cloud External IP Addresses
Cloud Firewall Rules
Cloud Interconnect
Cloud Network
Cloud Load Balancing
Storage and Databases
Persistent-Disk
Bigtable
Datastore
Cloud Spanner
Cloud SQL
Cloud Storage

Overview


Compute
EC2
Lambda
EC2 Container Service
Elastic Beanstalk
Elastic Load Balancing
Networking
VPC
Direct Connect
Route 53
Analytics
EMR
Data Pipeline
Kinesis
Machine Learning
QuickSight
Elasticsearch Service
Developer Tools
CodeCommit
CodeDeploy
CodePipeline
Management Tools
CloudWatch
Cloud Formation
CloudTrail
Config
OpsWorks
Service Catalog
Security & Identity
Identity & Access Management
Directory Service
Trusted Advisor
Cloud HSM
Key Management Service
Web App Firewall
Storage & Content Delivery
S3
CloudFront
EFS
Glacier
Storage Gateway
Snowball
Application Services
API Gateway
AppStream
CloudSearch
Elastic Transcoder
SES
SQS
SWF
Hubs
Mobile Hub
Mobile Services
Cognito
Device Farm
Mobile Analytics
SNS
Database
RDS
DynamoDB
ElastiCache
RedShift
Simple DB
Database Migration Service
IOT
IoT
Enterprise Applications
WorkSpaces
WorkDocs
WorkMail
amazon web services

Additional Activity

What would you use the below resources for?

1. Compute Engine
2. Cloud Functions
3. Cloud Storage
4. Cloud SQL
5. Cloud Spanner

Additional Activity

What would you use the below resources for?

1. AWS EC2
2. AWS S3
3. AWS Aurora
4. AWS Lambda
5. AWS Elastic Beanstalk

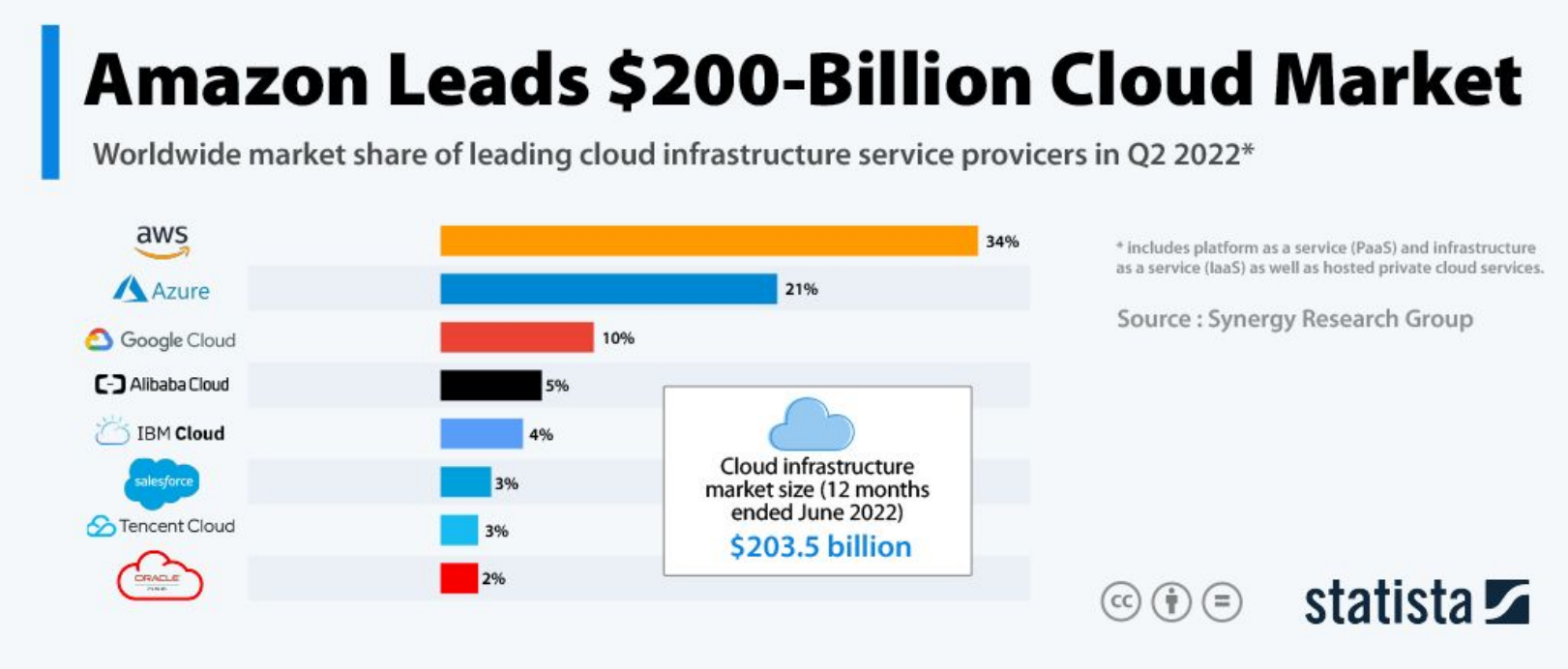
GCP vs AWS

Market Share

In Q3 2022, global cloud infrastructure service spending climbed to $57 billion, bringing the industry total for the trailing twelve months to $217 billion.

As the following chart shows, Amazon, Microsoft and Google accounted for two thirds of cloud infrastructure revenues in the three months ended Sept. 30, with the eight largest providers controlling more than 80 percent of the market.

Market Share



Pricing

Very identical pricing strategy:

- AWS Reserved Instances & Spot Instances vs GCP Committed Use & Preemptible Instances
- Initial Bonus Packages (AWS Free Tier vs GCP $300 Bonus)

That said, GCP prides itself on lower costs compared to AWS.

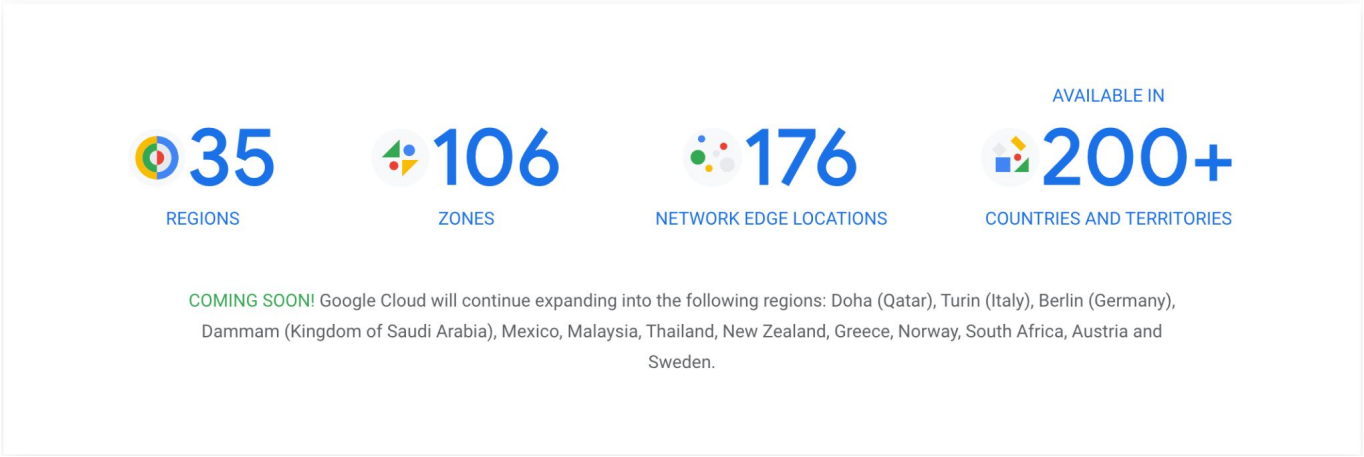
Features & Services

Google Cloud offers around **95 different services**, whereas AWS offers **more than 200**.

Many of the additional services are important for large enterprises with specific requirements for their cloud environments, although Google Cloud does offer a core range of services that meet the needs of most businesses.

FYI: GCP is known to be developer-centric whereas AWS is more for the masses

Global Reach



Free Tier

AWS divides its free tier promotions between selected services for 30-day, 12-month, and always-free periods, subject to consumption limits.

By comparison, Google Cloud keeps it simple by offering always-free tiers on 24 products and services—also subject to consumption limits.

Which Is Better?

You Decide...

AWS is perhaps the best choice for large enterprises with specific requirements, for multinational companies with a presence in many countries, and for businesses outside of the United States and Europe.

AWS also offers excellent levels of support, availability, and greater redundancy.

Activity

Learner:

- Clean up AWS.
- Remove/delete/terminate all service/ resources that created.

Instructor

- Clean up AWS.
- Remove/delete/terminate all service/ resources that created.
- Check the AWS account after learner clean up.

What’s Next?