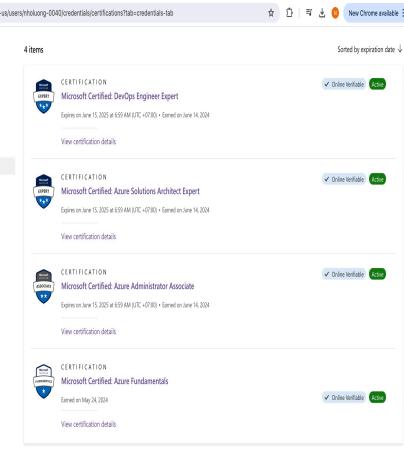
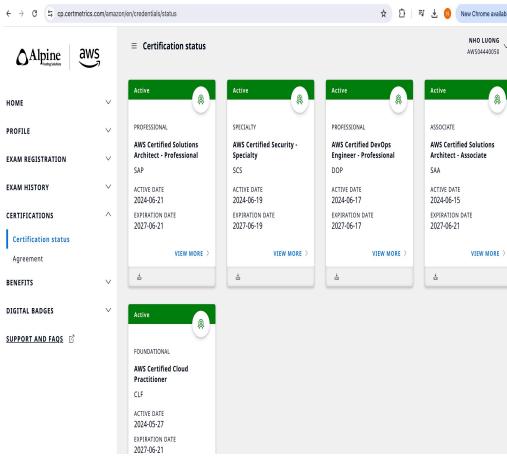


Cookbooks

Author: Nho Luong

Skill: DevOps Engineer Lead



Nho Luong has successfully passed all requirements for Microsoft Certified: Azure Solutions Architect Expert

Credential ID: 3cfc3d140253f651
Certification number: 46f9fb-703f58
Earned on: June 14, 2024
Expires on: June 15, 2025

Microsoft Certified: Azure Solutions Architect Expert

Nho Luong has successfully passed all requirements for AWS Certified Solutions Architect - Professional

VALIDATION NUMBER: 119ee670510e4bb99fe2956152effb7e
VALIDATE AT: <https://aws.amazon.com/verification>

Issue Date: June 21, 2024
Expiration Date: June 21, 2024



Welcome to something a little different

Continuation of our DevOps event series Very interactive format ! Lean

Beer™ style Feedback very welcome ! Future topics might include:

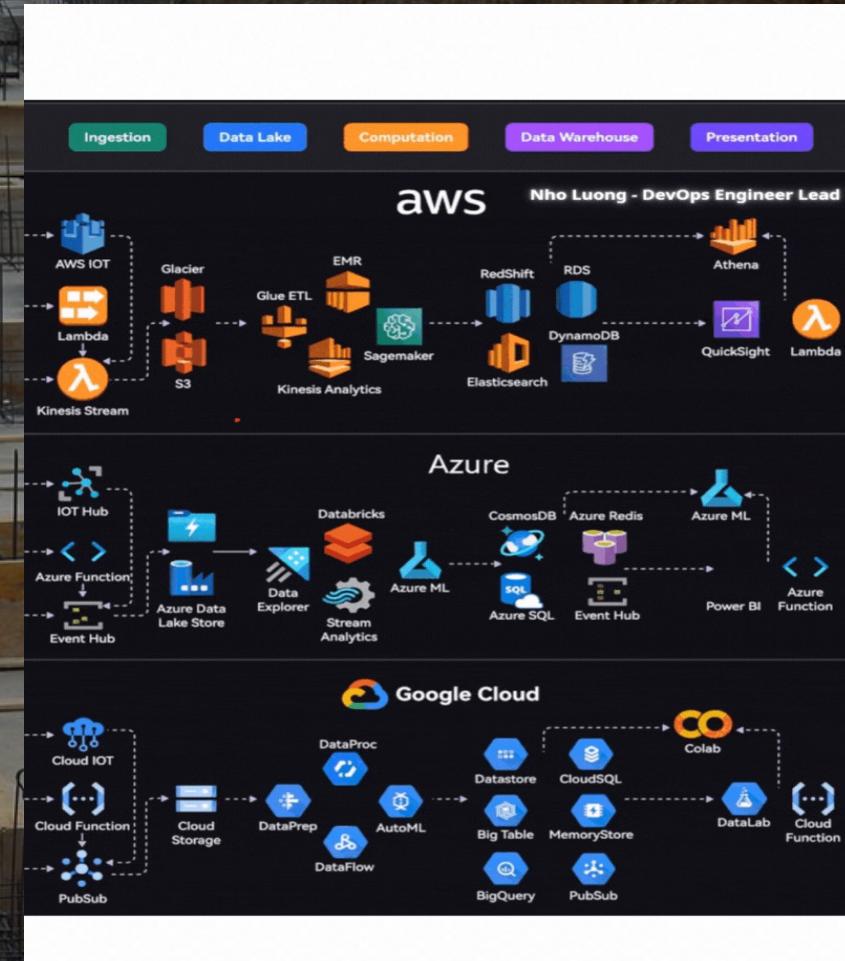
Puppet vs Ansible

Docker vs Packer

Prometheus vs ELK

ELK vs Splunk

AWS Vs Azure Vs GCP



Author: Nho Luong

Skill: DevOps Engineer Lead

What are we going to do?

- Overview - 60 minutes
 - 20 - AWS
 - 20 - Azure
 - 20 - GCP
- Breakout into groups to discuss - 30 minutes
 - Positives
 - Negatives
 - Decisions
- Each group shares their key findings with the others - 30 minutes
- Vote & declare the winner, then beers.

Pillars of Cloud Services

Scalability

Availability

Resiliency

Management

Security

Infrastructure

Compute

Storage

Networking



Google
Cloud Platform

AWS Products



Compute



Storage



Database



Migration



Networking & Content Delivery



Developer Tools



Management Tools



Media Services



Security, Identity & Compliance



Analytics



Machine Learning



Mobile Services



AR & VR



Application Integration



Customer Engagement



Business Productivity



Desktop & App Streaming



Internet of Things



Game Development

Author: Nho Luong

Skill: DevOps Engineer Lead

Regions & Availability Zones



N. Virginia (6)
Ohio (3) N.
California (3)
Oregon (3)
Mumbai (2)
Seoul (2)
Singapore (3)
Sydney (3)
Tokyo (4) Osaka-
Local (1) Canada
Central (2)
Beijing (2)
Ningxia (3)



Over 120 Edge locations

Who uses AWS

Gartner



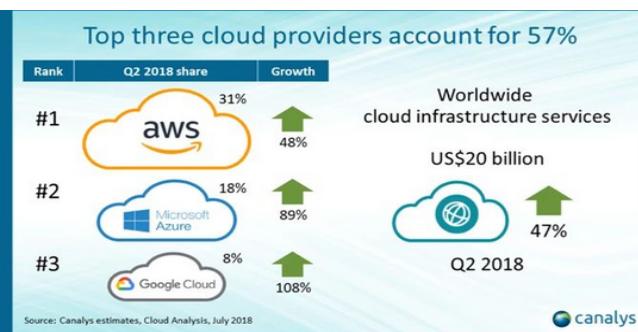
All Sizes of customers - over 1,000,000 customers

Baidu 百度



NETFLIX

UBER



twitch

twitter

LinkedIn

facebook

BBC

Security & Compliance



CloudTrail - Compliance Audits Trusted Advisor - Real-



time insight Enterprise Support - Technical Account



Manager (TAM) KMS - Key Management Service Cloud



HSM - Hardware Security Module



AWS CLOUDHSM





- Managed Components

- AMI's CloudFormation
- Stacks

- Flexible Licensing Models

- BYOL Pay
- per hour

splunk>enterprise



TERADATA



FORTINET®



CISCO™



Supports Many different Languages - Lambda



- 4.3
- 6.10
- 8.10



- 1.0
- 2.0
- 2.1 +



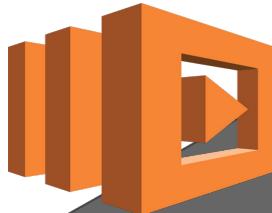
1.X



- 2.7
- 3.6



8



Invoking a
Lambda Function
On Demand



AWS Config Amazon
Alexa Amazon Lex
Amazon API Gateway
AWS IoT Button
Amazon CloudFront
Amazon Kinesis Data
Firehose

Amazon S3 Amazon DynamoDB
Amazon Kinesis Data Streams
Amazon Simple Notification Service
Amazon Simple Email Service
Amazon Simple Queue Service
Amazon Cognito AWS
CloudFormation Amazon
CloudWatch Logs Amazon
CloudWatch Events AWS
CodeCommit Amazon CloudWatch
Events

Triggered by events

Databases - Choices

- RDS
 - MariaDB, Amazon Aurora, Oracle, SQL Server, PostgreSQL, MySQL
- Non Relational
 - DynamoDB
- Graph
 - Amazon Neptune
- In Memory
 - AWS ElastiCache
- Data Warehousing
 - Redshift
- Migration



Instance Families

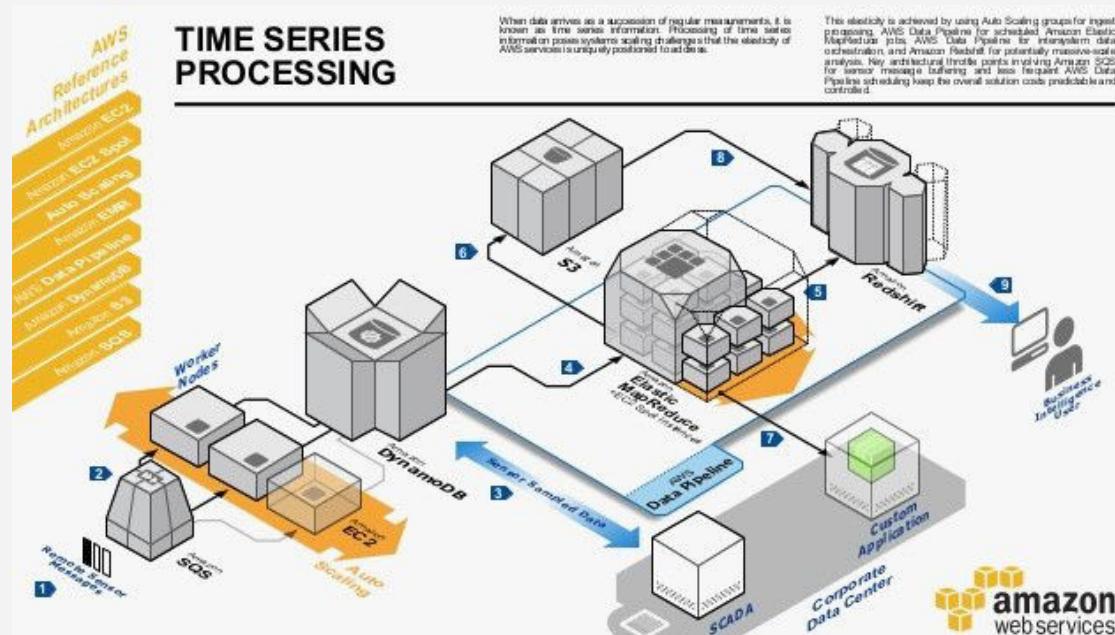
Placement Groups - Allows reduced network distance

- **Burstable:** T (10% capacity, burst to 100%) - Free Tier
- **General purpose:** M
- **Compute optimized:** C (CPU Focused)
- **Memory optimized:** R, X, Z (RAM Focused)
- **Storage optimized:** D, H ,I (IO Focused)
- **Accelerated computing:** F, G, P (Hardware Acceleration Focused)

t3.nano (1 vCPU, 512 MiB) <-----> u-12tb1.metal (448 vCPU, 12 TiB)

VPC Separation & Low level network control

- Direct Connect VPN
- Connections VPN Peering VPC
- Separation Subnets
- (Private/Public) Security
- Groups NAT Gateways Virtual
- Private Gateways Network
- Access Control Lists Elastic
- IP's Elastic Load Balancers
-
-
-



SQS, Kinesis, Firehose

Simple Queue Service

- FIFO - only once
- Best Order - at least once

Kinesis

- Massively, Scalable & Durable real-time data streaming service

Firehose

- Delivery of kinesis into storage

SES

- Email services

SNS

- Topics and Subscriptions push notifications



SNS, SES

Tooling & API's

AWS - CodeStar, CodeCommit, CodeBuild,
CodeDeploy, CodePipeline

Terraform / CloudFormation

AWS Tools for Azure DevOps

Ansible, Puppet, Chef

AWS - CLI/SDK





Ease of Entry .

AWS Training APN

Partner Training AWS

Certification AWS

Academy AWS

Educate

Author: Nho Luong

Skill: DevOps Engineer Lead

DATABASE	Amazon RDS	APPLICATION SERVICES	Amazon API Gateway
	750 Hours per month of db.t2.micro database usage (applicable DB engines)		1 Million API Calls Received per month
DEVELOPER TOOLS	AWS Trusted Advisor	STORAGE & CONTENT DELIVERY	Amazon CloudFront
	4 checks on performance and security		50 GB of data transfer out
STORAGE & CONTENT DELIVERY	Amazon S3	COMPUTE	Amazon EC2
	5 GB of standard storage		750 Hours per month
COMPUTE	Elastic Load Balancing	DATABASE	Amazon ElastiCache
	750 Hours per month shared between Classic and Application load balancers		750 Hours of cache.t2.micro Node usage
MANAGEMENT TOOLS	AWS OpsWorks for Chef Automate	STORAGE & CONTENT DELIVERY	Amazon Elastic Block Storage
	7500 node hours (which equals 10 nodes) per month		30 GB
ARTIFICIAL INTELLIGENCE	Amazon Polly	ANALYTICS	Amazon Elasticsearch Service
	5 Million		750 Hours



The Good & The Bad

GOOD

- Capability to build anything
- Ease to automate
- Constantly innovating
- Language & OS agnostic
- Huge user base Great
- support



BAD

- Small components, difficult to start
- Out of Free Tier, everything costs
- No Event Bus AI Offering &
- Machine learning poor compared to other offerings AWS Users / Server Roles

-



Azure

More than 95 percent of Fortune 500 companies use Azure

120,000 New Azure Customers per month

30+ years Over three decades of experience serving enterprise customers

68,000+ partners

70+ certifications

Cloud Leader since 2015



54 Regions



Author: Nho Luong

Skill: DevOps Engineer Lead

Services

Compute Web & Mobile Data &

Storage Analytics Integration

(Hybrid and Cloud) Internet of

Things

Networking Hybrid

Operations Security &

Management Developer

Services Machine

Learning and AI Support

Platform Services

Security & Management



Compute



Web and Mobile



Developer Services



Hybrid Operations



Integration



Analytics & IoT



Data



Media & CDN



Infrastructure Services

Compute



Storage



Networking



Datacenter Infrastructure (54Regions)

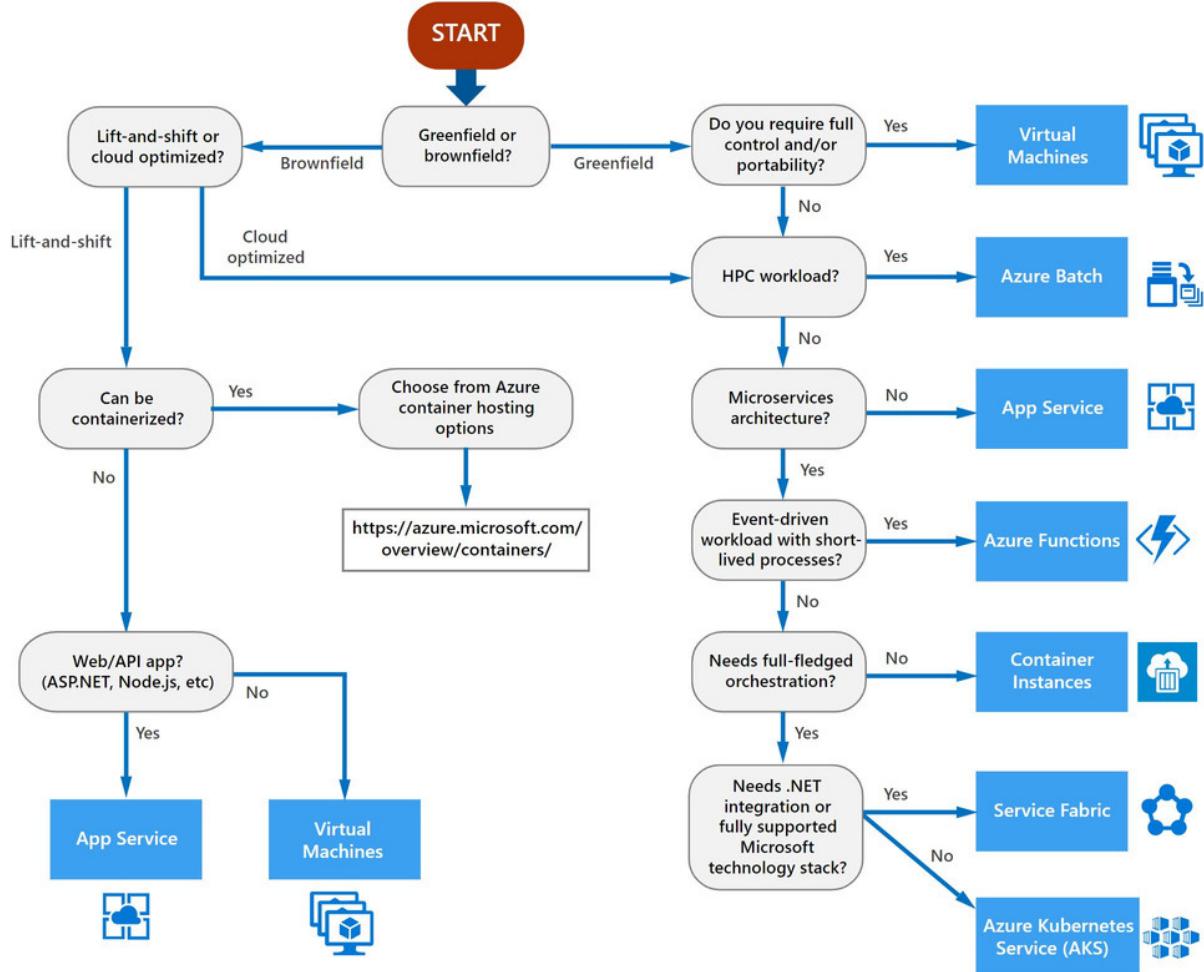


Author: Nho Luong

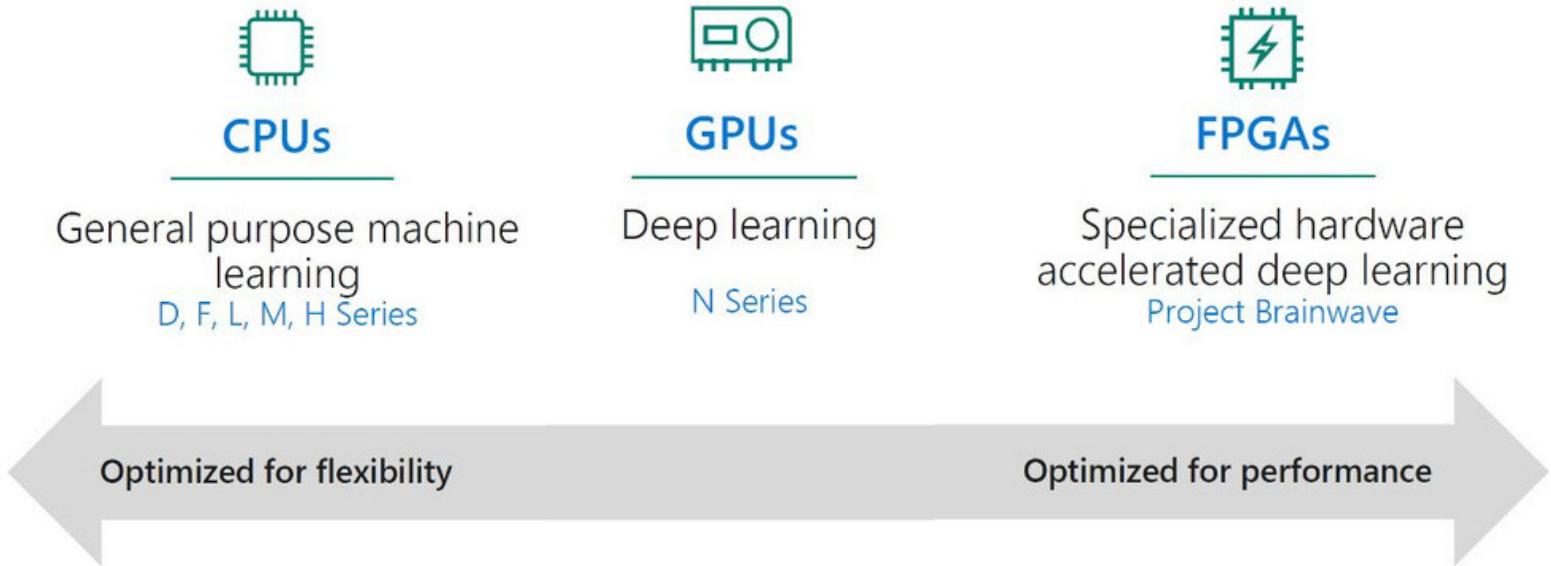
Skill: DevOps Engineer Lead

Azure Compute

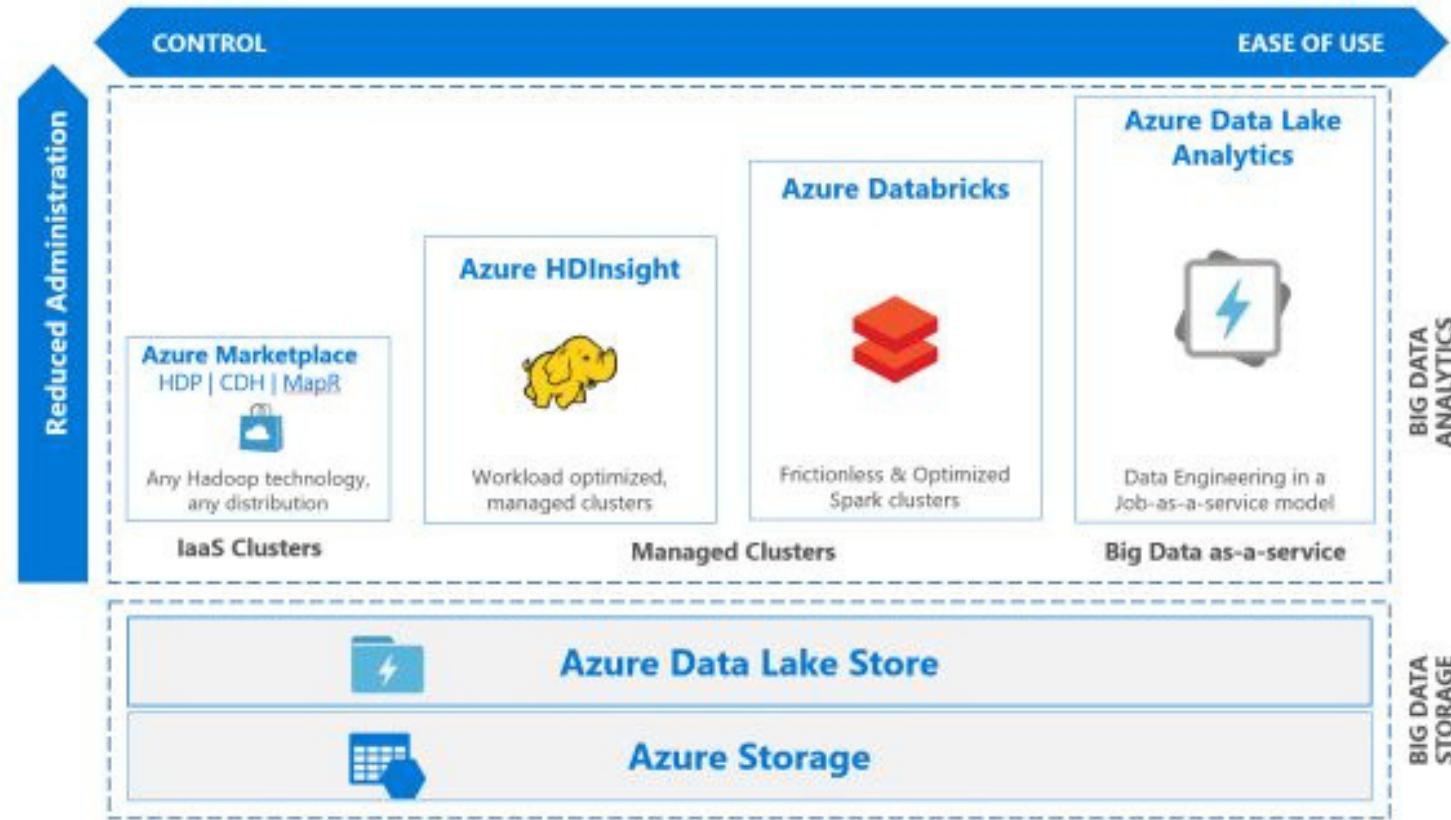
Virtual Machines Windows
Virtual Machines Linux VMs
Virtual Machine Scale Sets
Azure Batch Azure
Container Service
Container Instances Azure
Container Service
Kubernetes Service Azure
Container Registry Cloud
Services Service Fabric
Service Fabric Mesh Azure
Functions
Azure Batch AI DSVM



The Compute Power



KNOWING THE VARIOUS BIG DATA SOLUTIONS

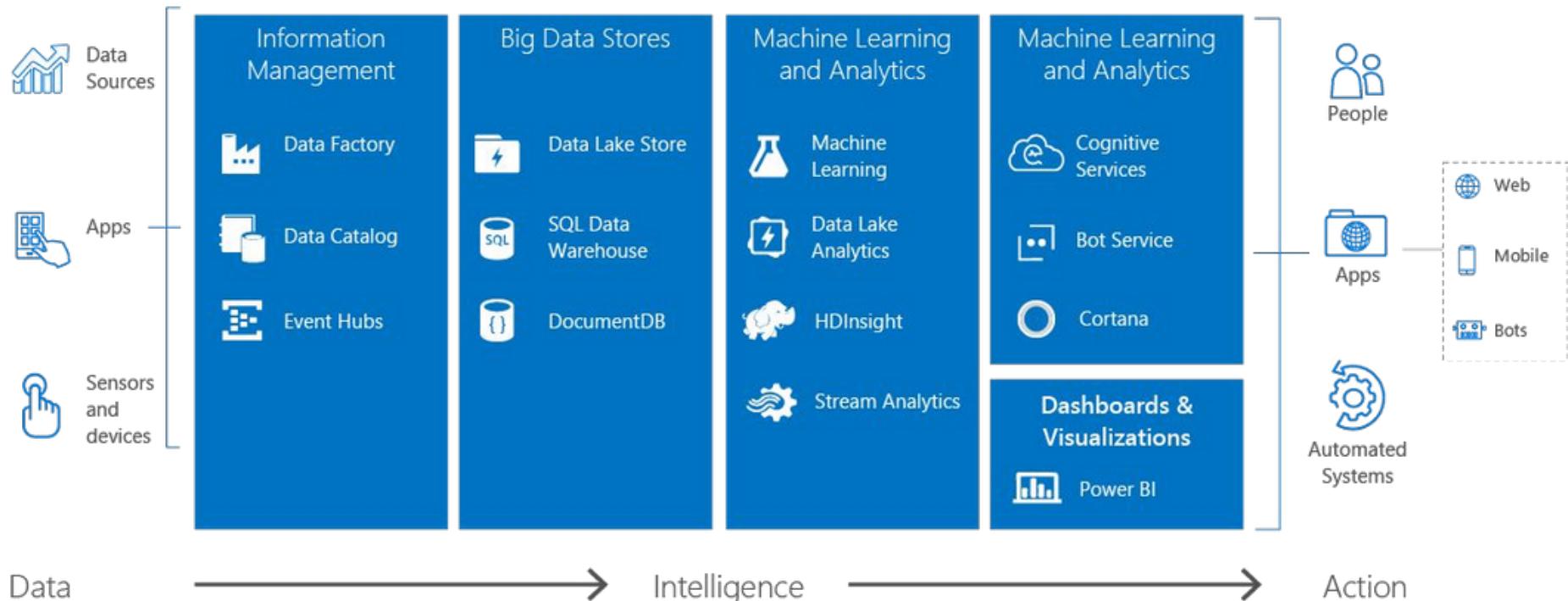


Azure Data Storage and Analytics

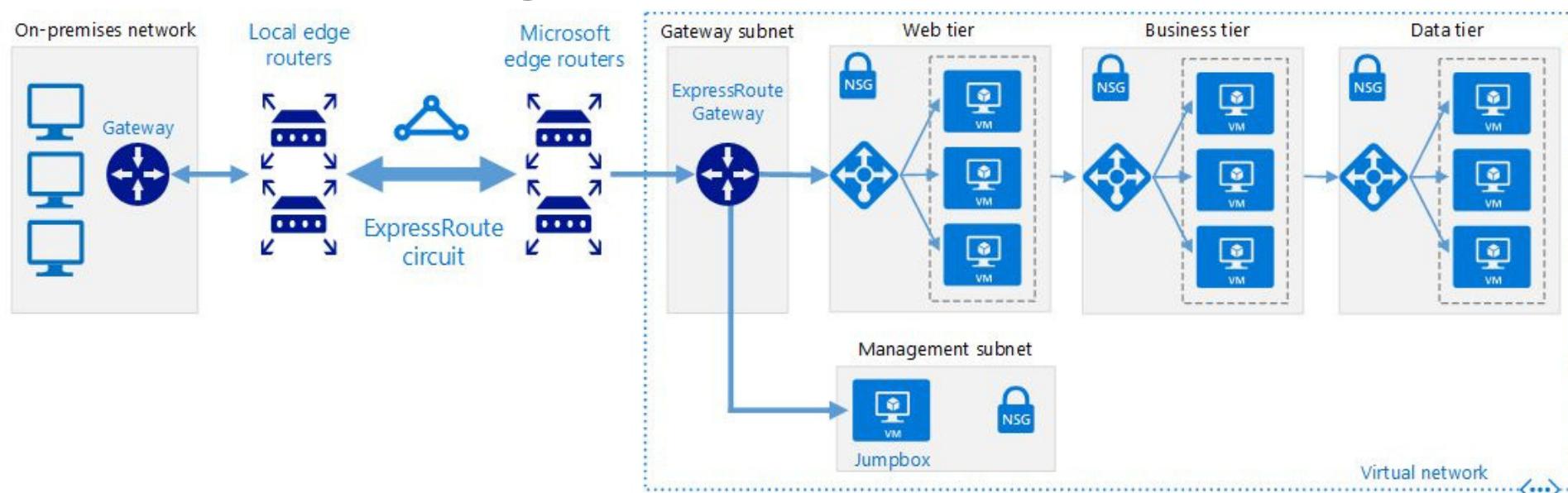


- Azure SQL Database
- Azure Data Warehouse*
- Azure Data Lake Store
- Azure Storage Azure
- Cosmos DB*
- Azure Data Factory*
- Event Hub Event Grid IoT hub Stream Analytics Data Catalog Data Explorer*
- Machine Learning*
- Data Lake Analytics*
- HDInsight Azure
- Databricks Analysis Services*

Azure Analytics in Action



Azure Networking



- Virtual Network
- Load Balancer
- Azure DNS
- Traffic Manager
- Data Gateway

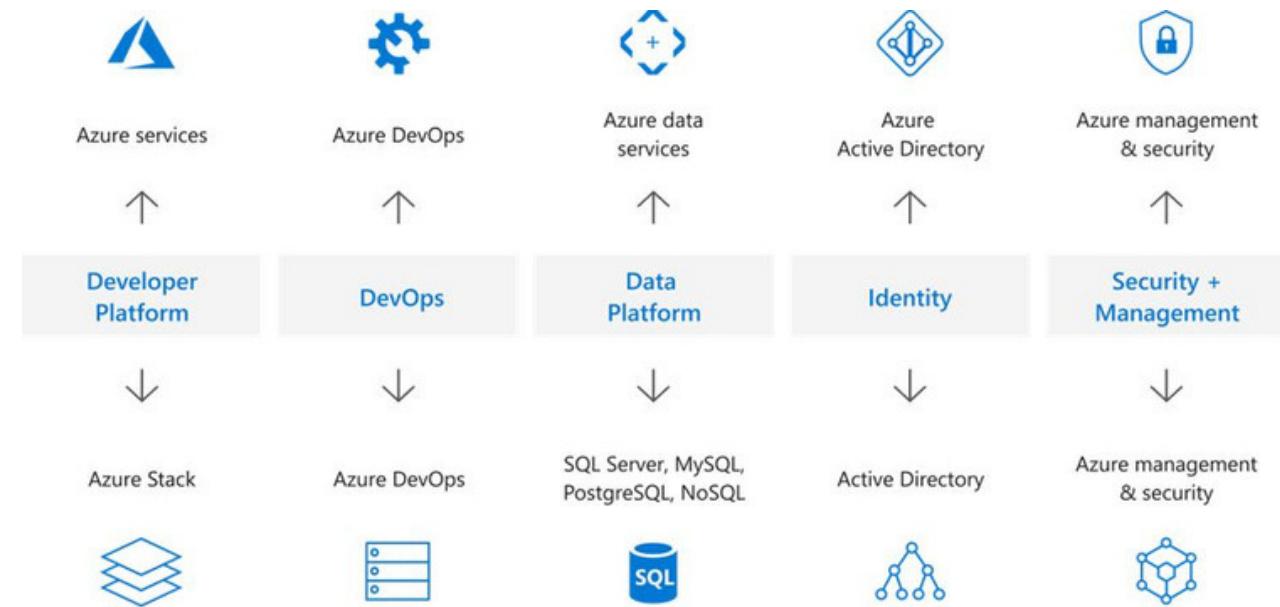
- VPN Gateway
- ExpressRoute
- Application Gateway
- Network Watcher
- CDN

Author: Nho Luong

Skill: DevOps Engineer Lead

Azure Hybrid Integration

- DMA/DMS
- Azure Managed Instance
- Azure Backup
- Azure Recovery
- Azure Storsimple
- Azure Sync
- Azure Data box
- Azure Gateways
- AD Connect
- Containers Service
- Azure Stack



Machine Learning and AI



Vision



Speech



Language



Knowledge



Search



Bot Service



Language
Understanding



QnA Maker



Azure Machine
Learning



Visual Studio
Code Tools for
AI



Machine
Learning Studio

Tools

- ML Studio VS Code
- ML.NET Azure ML
- Packages AI Toolkit for IoT MML Spark
-
-
-

Framework

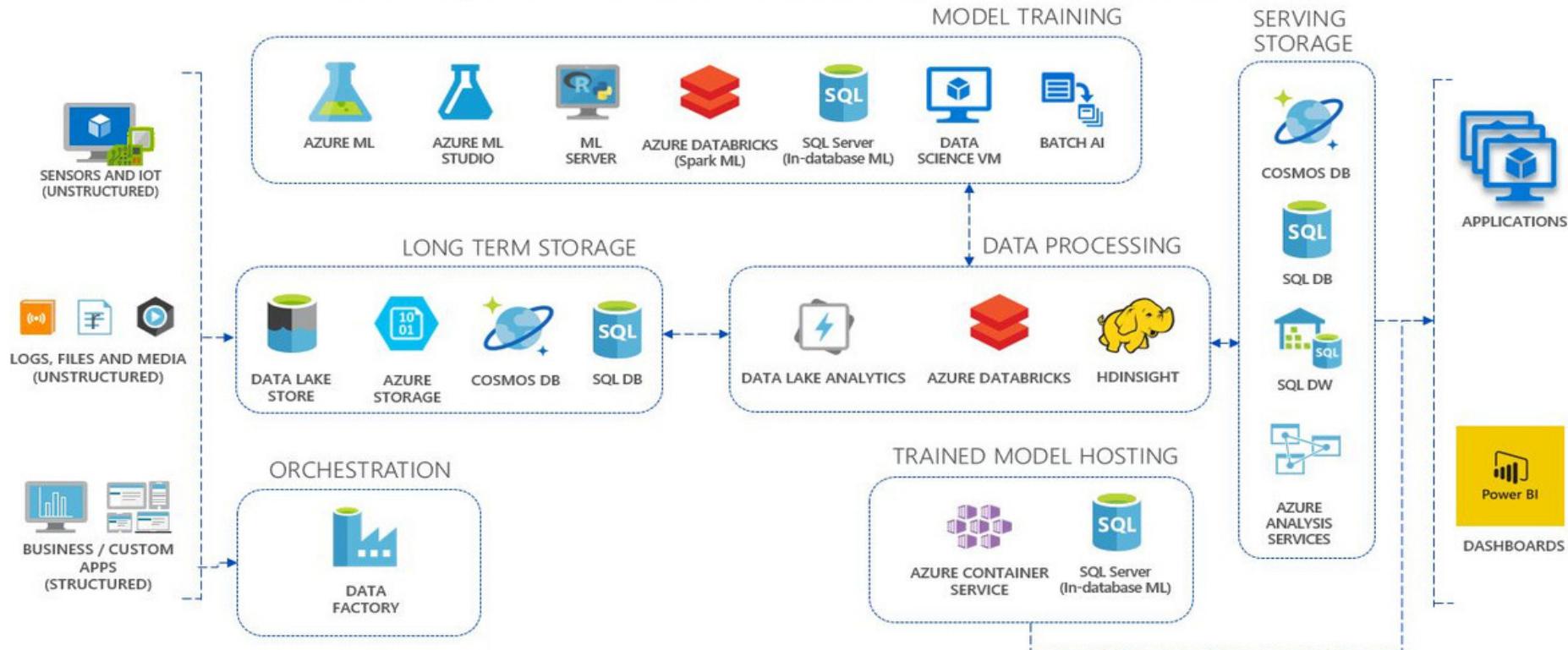
- CNTK
- ONNX
- TensorFlow
- Pytorch
- MXNet
- Caffe2

Infrastructure

- Azure Batch AI / DSVM
- AKS ADLS Databricks
- Spark for Azure HDInsight
- Edge SQL
-
-
-

Azure Advanced Analytics Pattern

Performing data collection/understanding, modeling and deployment



Azure Dev and Ops Support

- Visual Studio Code Azure SDK Command-line tools
- Azure PowerShell Azure Command-Line Interface (Azure CLI)
- Storage Explorer Visual Studio Tools for Azure Visual Studio for Mac Docker Tools
- Azure Portal! DevOps OMS and log analytics
-
-

Build cloud apps for Java, Node, Python, Ruby, PHP or .NET T-SQL!

Security and Compliance

- Azure AD Subscription Security - IAM and RBAC Operational Security - Advanced
- Threat Detection, Auditing and Logging, OMS Network Security Compute
- Security Key Security Data Security Identity and Information Protection Security
- Centre 70+ Global, Government, Industry and Regional Compliances inc GDPR
-
-
-
-
-
-
-
-

Azure - What's Different

Regions

PaaS Power

Nature of Integration

Easier - Everything

Hybrid

Documentation

Development platform

Community

Reporting platform

I

Support

Ethos and Philosophy

TCO

Azure - Good and Bad

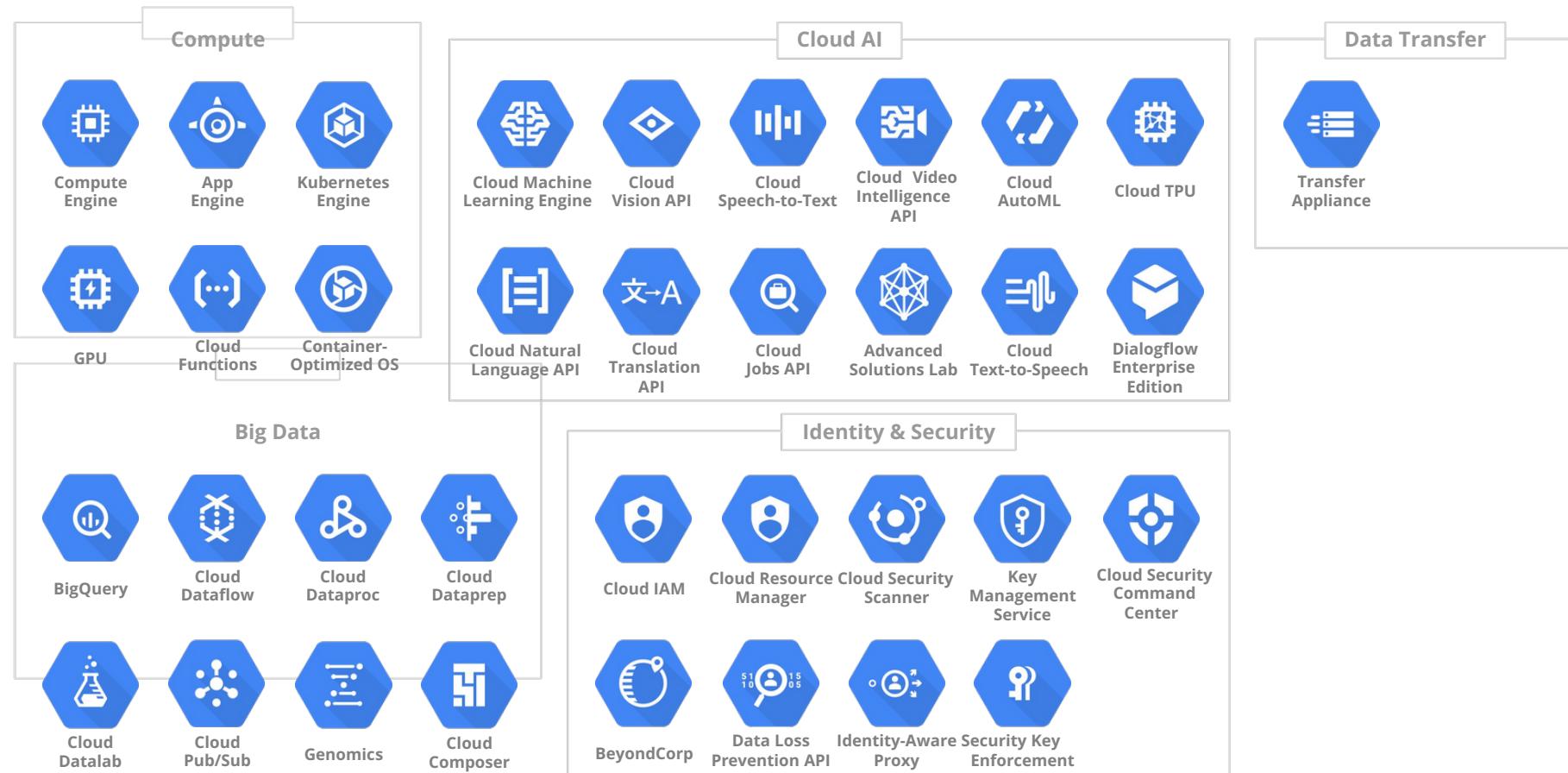
Positives

- True Trusted Enterprise Dominance in Paas, ML,
- Analytics, IoT, PowerBI Maturity - Cloud Leader
- since 2015 Great Dev and Test support and tools
- Works well in Windows or Microsoft environment
- Agility and commitment Great knowledgeable
- support 54 regions and Data box! Clear
- consideration for .NET. Open Source integration
- Hybrid consistency
-
-
-

Negatives

- Maturity in Prod and Enterprise is low
- Cross platform Devops for some services
- can be tricky Free and Preview services
- Quick Releases, changes and updates
-

Google Cloud Platform Icons

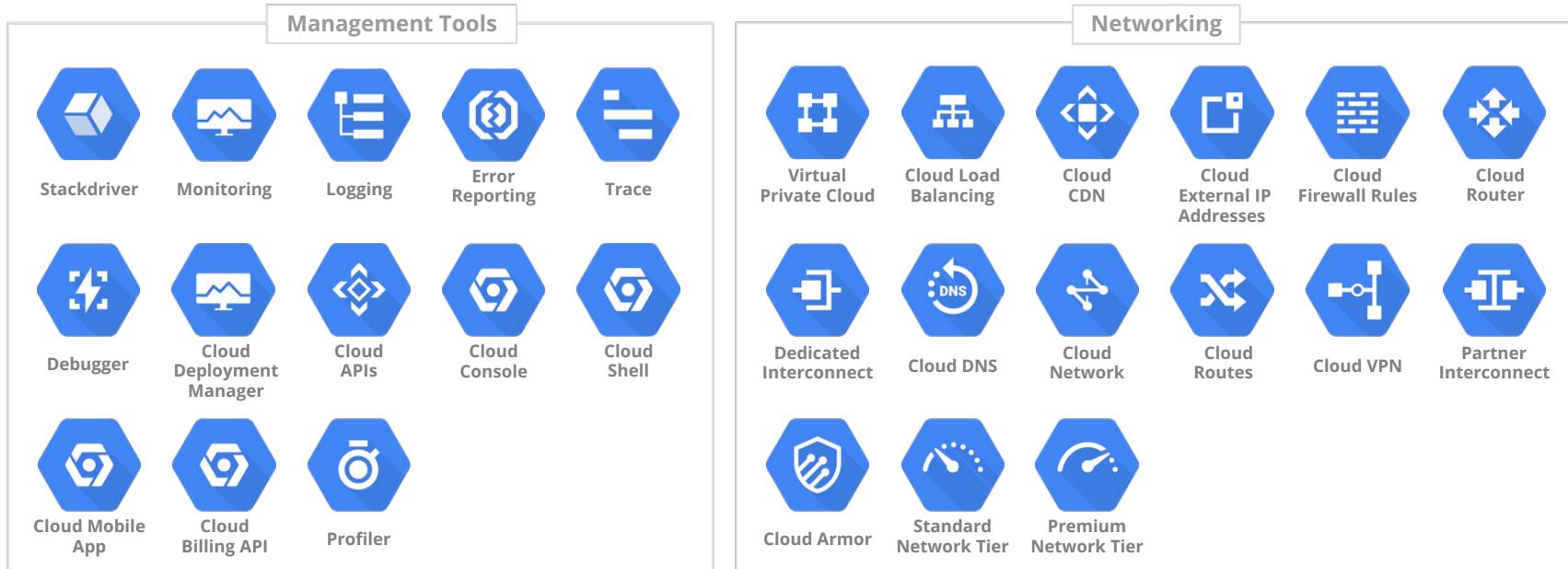


Author: Nho Luong

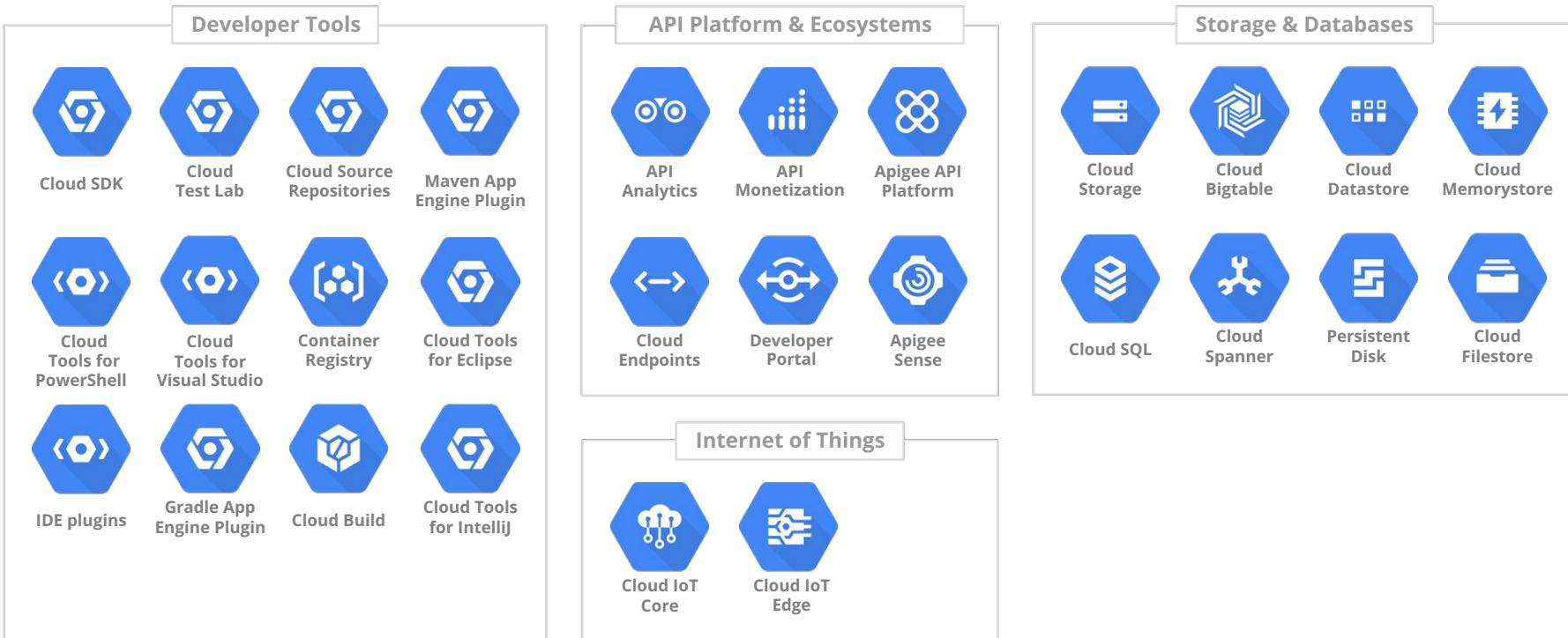
Skill: DevOps Engineer Lead

The Products logos contained in this icon library may be used freely and without permission to accurately reference Google's technology and tools, for instance in books or architecture diagrams.

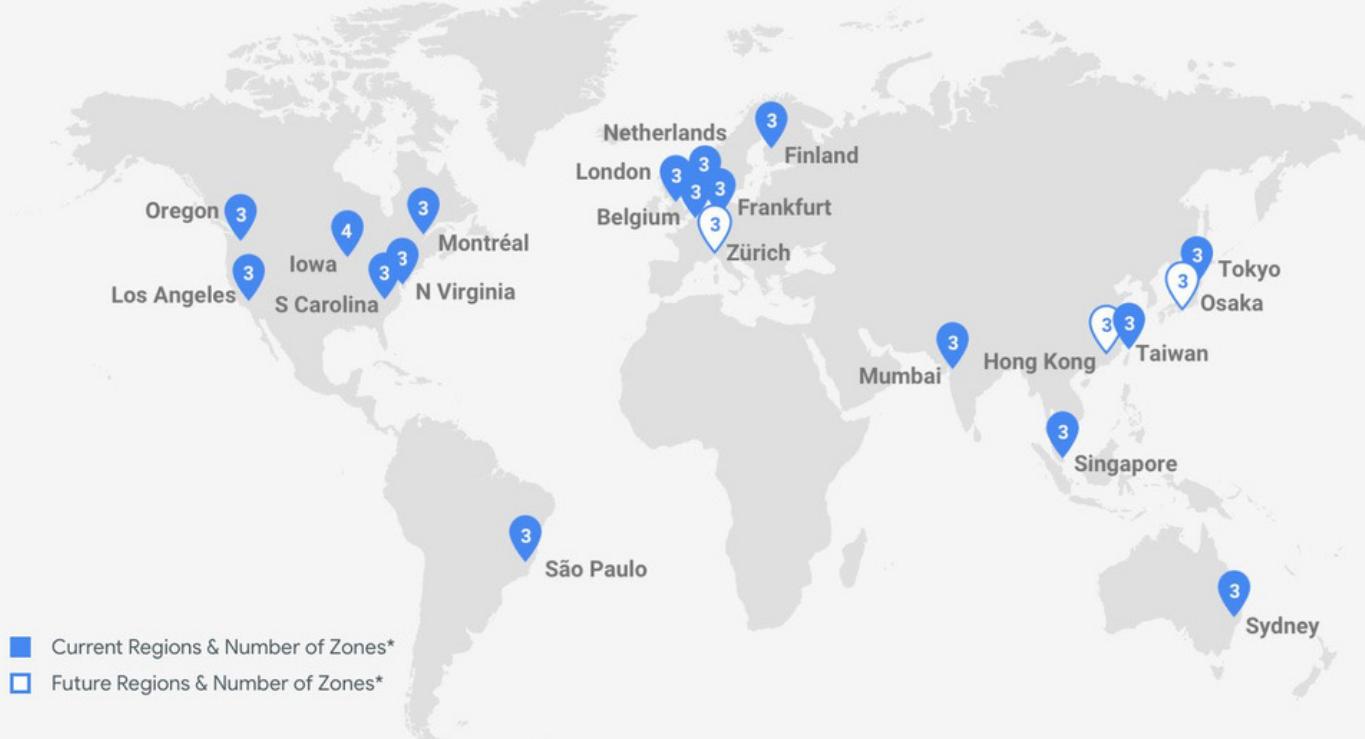
Google Cloud Platform Icons



Google Cloud Platform Icons



Regions and Zones

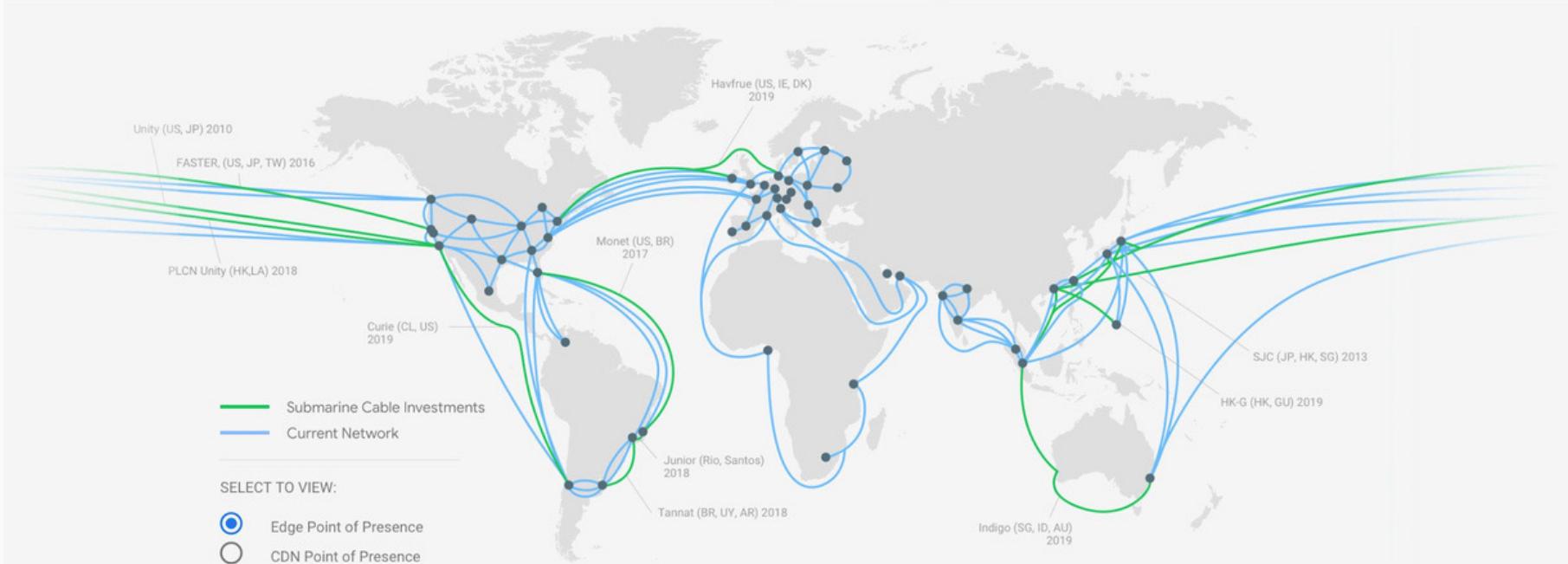


* While some regions may launch with 2 zones, all regions are planned for a minimum of 3 zones.

Author: Nho Luong

Skill: DevOps Engineer Lead

Network



Author: Nho Luong

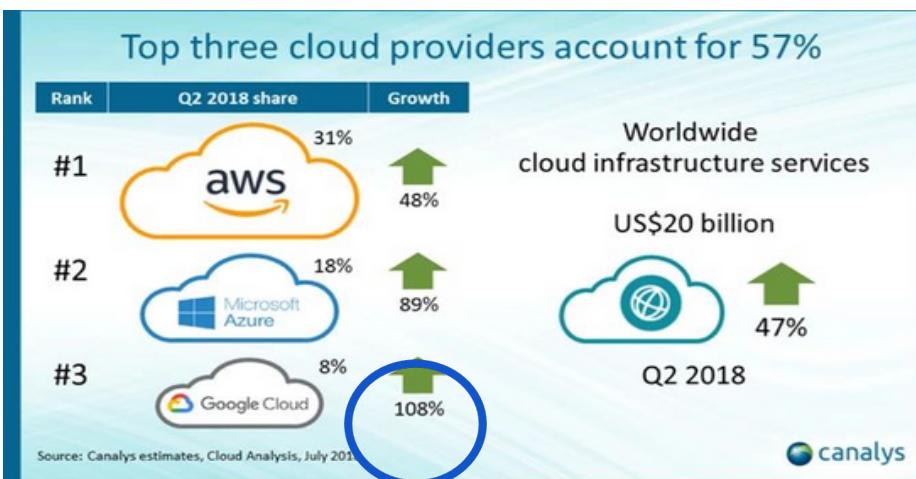
Skill: DevOps Engineer Lead

Where is GCP going

Totally ripped off this slide - Yoink!

Thanks Steven

<-- No Worries



Author: Nho Luong

Skill: DevOps Engineer Lead

12 Months

\$300 free credit to get started with any GCP product.



Always Free

Free usage limits on participating products for eligible customers, during and after the free trial. Offer is subject to change.

Always Free

 Google App Engine Platform for building scalable web applications and mobile backends.	 Google Cloud Datastore Google Cloud Firestore Beta Highly-scalable NoSQL database.	 Google Compute Engine Scalable, high-performance virtual machines.
28 Instance hours per day	5 GB Cloud Storage	1 GB Storage
 Google Cloud Storage Best in class performance, reliability, and pricing for all your storage needs.	 Google Cloud Pub/Sub A global service for real-time and reliable messaging and streaming data.	 Google Cloud Functions A serverless environment to build and connect cloud services with code.
5 GB-Months Regional storage	10 GB Messages per month	2 million Invocations per month

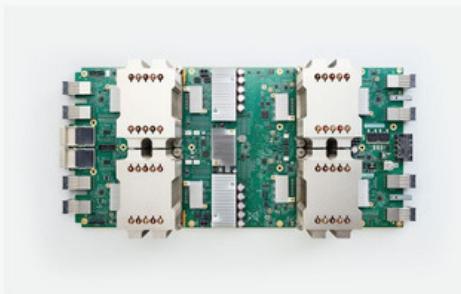
Author: Nho Luong

Skill: DevOps Engineer Lead

Google Cloud Platform - Machine Learning and AI

- Developer ready API's
 - Vision API - Image Content Analysis
 - Cloud speech to text Cloud text to speech Cloud natural language processing
- Firebase Predictions API
 - <https://firebase.google.com/products/predictions>
L
- DialogFlow
 - ChatBot (Conversational Interfaces and leverages Google ML)
 - Google Cloud Functions Ready Multi Language Support
 -
- More control - Cloud Machine Learning Engine or Cloud TPU's
 - TensorFlow Model Creation Access to high throughput/spec machines

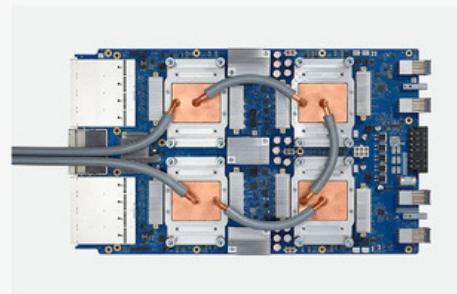
Cloud TPU offering



Cloud TPU v2

180 teraflops

64 GB High Bandwidth Memory (HBM)



Cloud TPU v3 Alpha

420 teraflops

128 GB HBM



Cloud TPU v2 Pod Alpha

11.5 petaflops

4 TB HBM

2-D toroidal mesh network

Google Cloud Platform - Databases

- Cloud SQL
 - MySQL or Postgres
- BigTable
 - Low latency Useful for AdTech
 - (instant response) NoSQL
 -
- Cloud Spanner
 - Mission Critical Relational Database
 - Transactional Powers Google Search
 -
- Lots of others like:
 - Cloud Datastore Cloud
 - Firestore Firebase Realtime
 - Database

Google Cloud Platform - Databases

Cloud Spanner: The best of the relational and non-relational worlds

	CLOUD SPANNER	TRADITIONAL RELATIONAL	TRADITIONAL NON-RELATIONAL
Schema	✓ Yes	✓ Yes	✗ No
SQL	✓ Yes	✓ Yes	✗ No
Consistency	✓ Strong	✓ Strong	✗ Eventual
Availability	✓ High	✗ Failover	✓ High
Scalability	✓ Horizontal	✗ Vertical	✓ Horizontal
Replication	✓ Automatic	⌚ Configurable	⌚ Configurable

Google Cloud Platform - Serverless

- <https://cloud.google.com/serverless/>
 - Cloud Functions
- - Less language coverage than AWS Lambda
 - Only recently out of Beta
- App Engine
 - Essentially bundle your apps (EG. Express) automatically in to Docker containers and deploy
- Cloud Pub/Sub
 - Like SNS - Message Architecture - Zero Config
- Kubernetes Engine Serverless AddOn
 - Run your own Kubernetes cluster whilst providing ability to deploy serverless apps to it
- Cloud Build
 - Serverless build and deployment pipelines

Google Cloud Platform - Kubernetes - OOTB



+ On-Prem

Google Cloud Platform - The Good and The Bad

Good	Ba
GCP Product Strategy Developer ready	GCP Product Strategy Cloud
PaaS, Serverless, Firebase	functions language coverage
Machine Deep Learning made (slightly) accessible	Less documentation of lower level config like VPC, Security
Serverless Offering Growing	IAM and Service Accounts

Personal experiences

- Which services have you had good experiences with Where have you found gaps / poor experiences

Please spread Azure & Google experience around the groups - use colour codes !



Thank You