



Introduction to Cloud

INNOVATE. TRANSFORM. DELIVER.

Agenda

1. History of Cloud Computing
2. What's the smell of Clouds?
3. Cloud Providers
4. Advantages
5. Disadvantages
6. Use Cases

History of Cloud Computing

History of Cloud Computing

1960s

John McCarthy – Introduces mainframe timesharing

1969

ARPANET (J.C.R. Licklider) introduces the idea of “Intergalactic Computer Network”

1970

VMWare – Enables run more tan one OS in an isolated environment

2003

Virtual Machine Monitor (VMM)
(Hypervisor), execution of multiple virtual guest OS simultaneously on the same machine

1999

Salesforce – Start the SaaS concept delivering Enterprise applications via website

1997

Cloud Computing term – Defined by Prof. Ramnath Chellappa

History of Cloud Computing

1995

amazon.com was launched

2000

Amazon launch an e-commerce service called Merchant.com

2002

Amazon Web Services platform exposes technology and product data from Amazon

2003

The initial growth of the idea evolved (the operating system becomes the internet)

2006

AWS launches Infrastructure as a Service (IaaS)



amazon
web services



Amazon
EC2

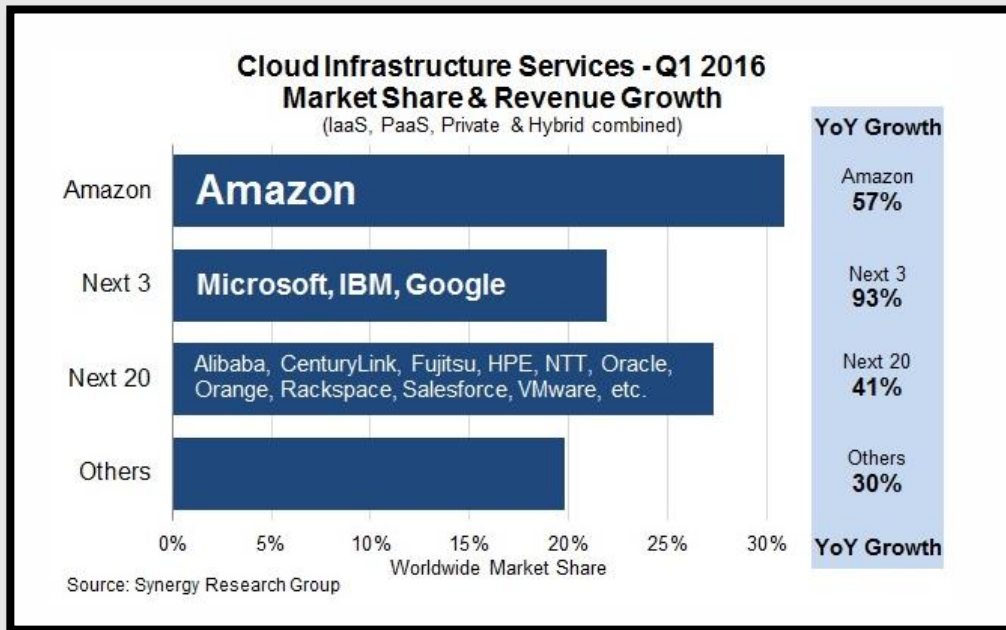


Amazon
S3

History of Cloud Computing

2014

2016



What's the smell of Clouds?

What's the smell of Clouds?

- What is “**The Cloud**”?
- What is “**Cloud Computing**”?
- What **services** do Cloud Services Providers (CSP) **offer**?
- What is **deep inside** those services?
- What are the Cloud Computing **Models**?
- ...



What's the smell of Clouds?

- What is “The Cloud”?
- Easy, “The computer of another”



What's the smell of Clouds?

- **Common Deployment Models:**
 - Public (**Hosted** - onPremise)
 - Private (Hosted - **onPremise**)
 - Hybrid (**Hosted & onPremise**)



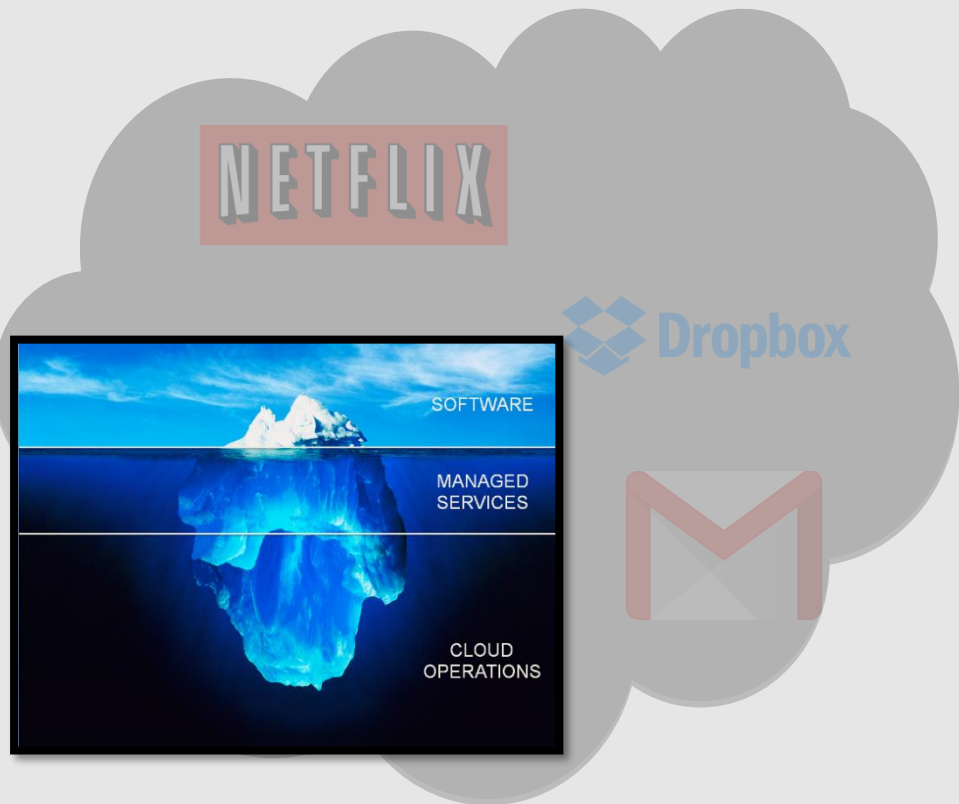
What's the smell of Clouds?

- What services do Cloud Services Providers (CSP) offer



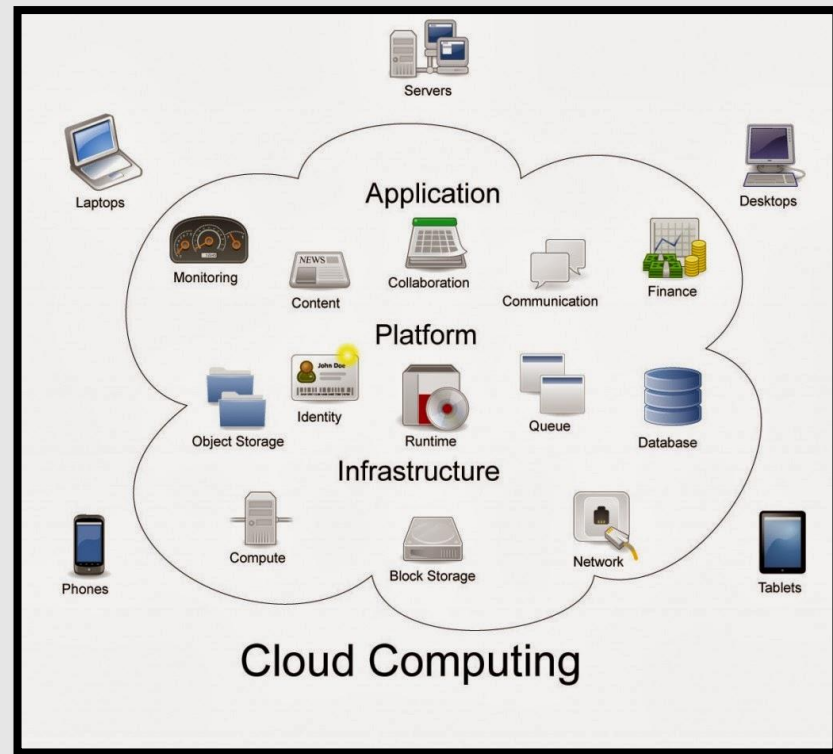
What's the smell of Clouds?

- What services do Cloud Services Providers (CSP) offer?



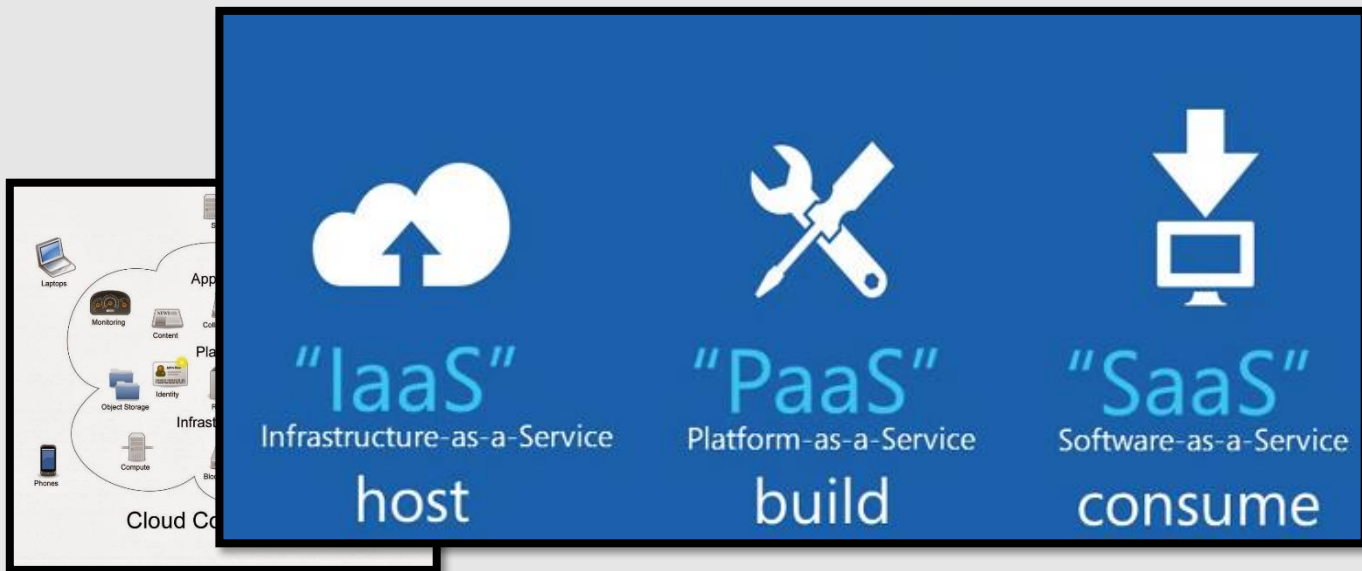
What's the smell of Clouds?

- What is deep inside those services?



What's the smell of Clouds?

- What are the Cloud Computing Models?



What's the smell of Clouds?

Separation of Responsibilities

On-Premises
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking

Infrastructure as a Service (IaaS)
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking

Platform as a Service (PaaS)
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking

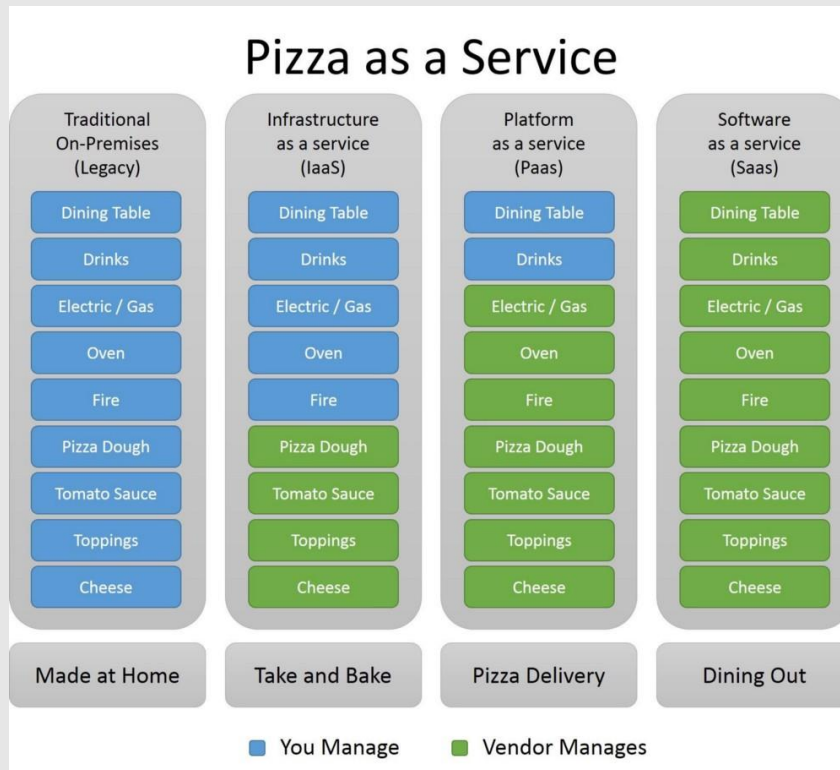
Software as a Service (SaaS)
Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking

	Owner / Subscriber
	Service Provider

Cloud Computing

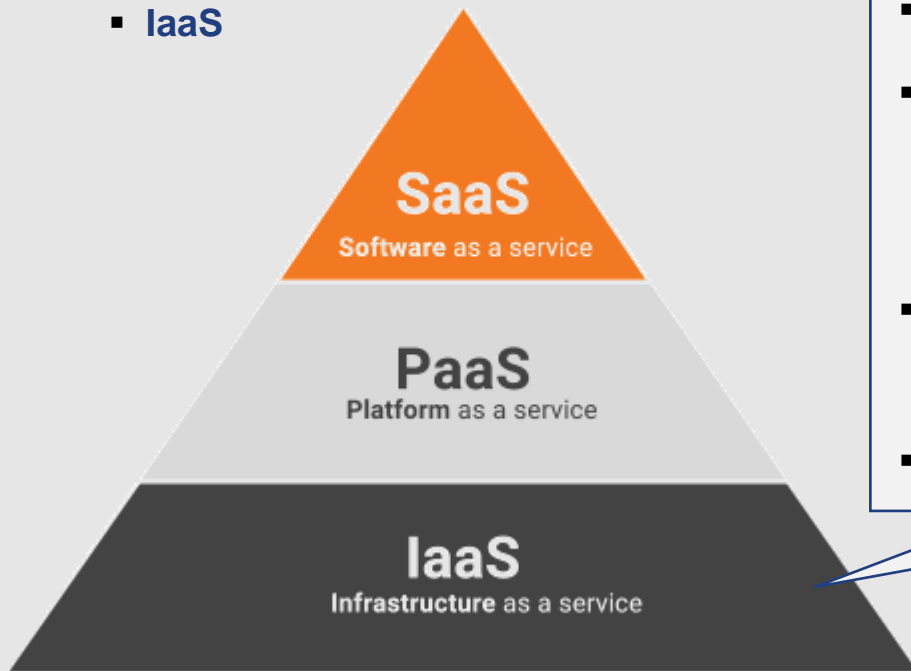


What's the smell of Clouds?



What's the smell of Clouds?

- **IaaS**



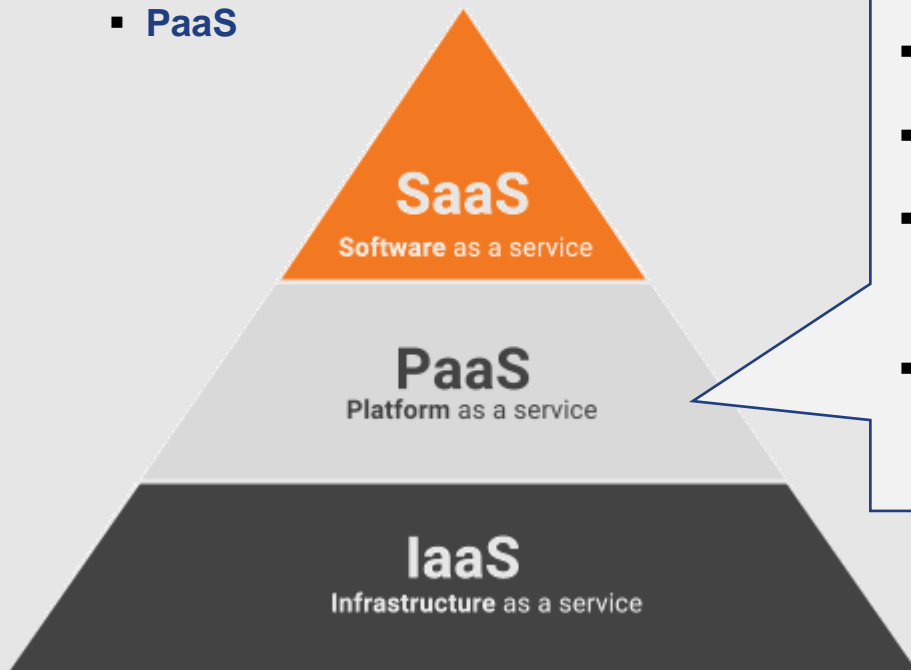
- Target **Audience**: DevOps
- **DevOps Responsibilities**: Environment Setup (OS, app. server, network), Hardware needed (CPU, Memory, etc) , etc.
- **Providers Responsibilities**: Hardware provisioning.
- **E.g**: AWS EC2, VMWare, vCloud



Flexibility – Responsibility – Cost

What's the smell of Clouds?

- **PaaS**



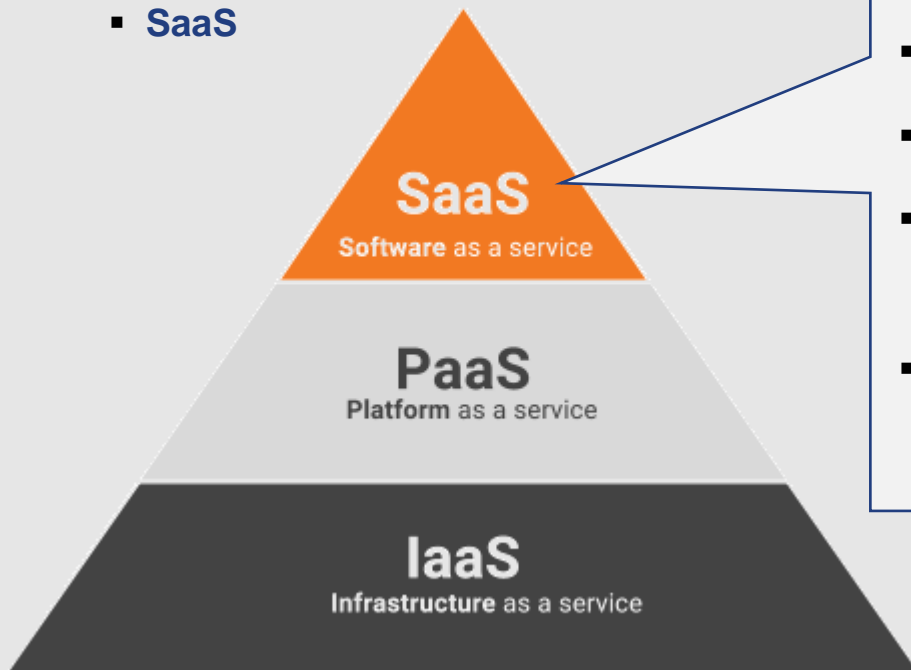
- **Target Audience:** Developers
- **Developers Responsibilities:** development
- **Providers Responsibilities:** Infrastructure maintenance.
- **E.g:** AWS Beanstalk, Google App Engine, Heroku, etc.



Flexibility – Responsibility – Cost

What's the smell of Clouds?

- SaaS



- **Target Audience:** Users & Developers
- **Users Responsibilities:** none
- **Providers Responsibilities:** development, application maintenance, etc.
- **E.g:** Gmail, dropbox, drive, google docs, etc.



Flexibility – Responsibility – Cost

What's the smell of Clouds?

- Quiz 1

YOUR OWN CAR



LEASED CAR



TAXI



BUS



What's the smell of Clouds?

- Quiz 2

- In a PaaS approach who have the responsibility to update/patch the Operative System?

- The user
- The Cloud Provider
- Your company IT department

Cloud Providers

Cloud Providers

- 2006



- IaaS



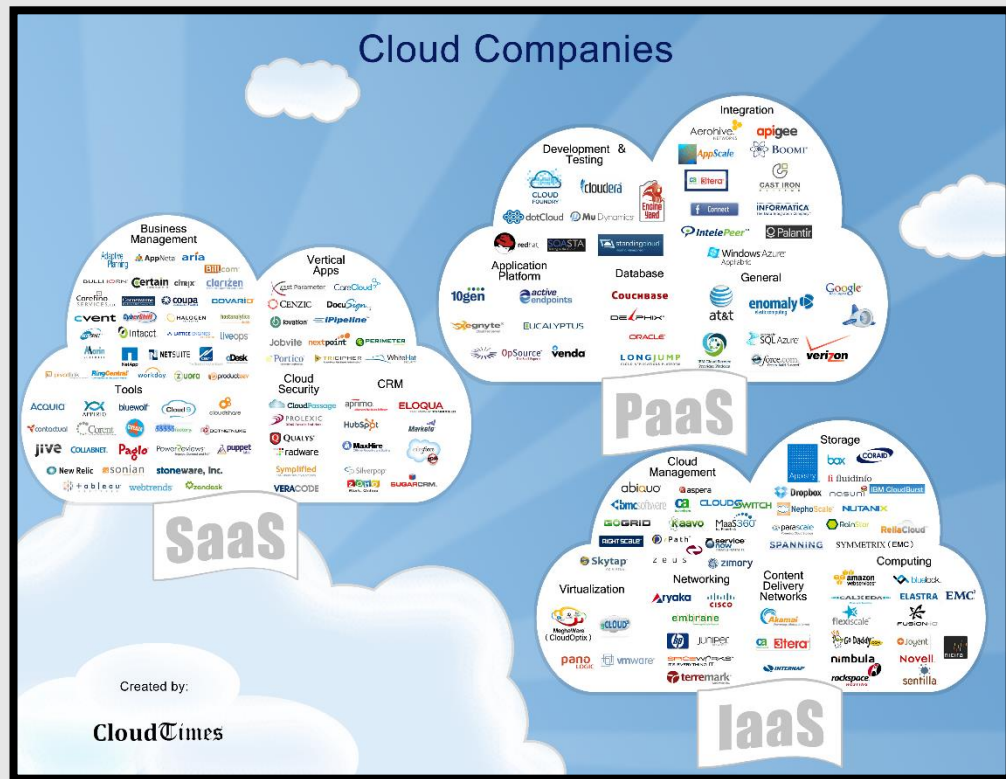
Amazon
EC2



Amazon
S3

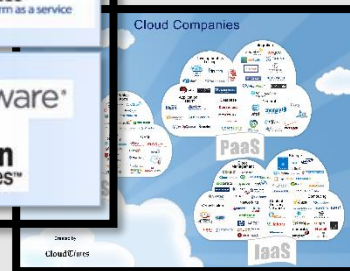
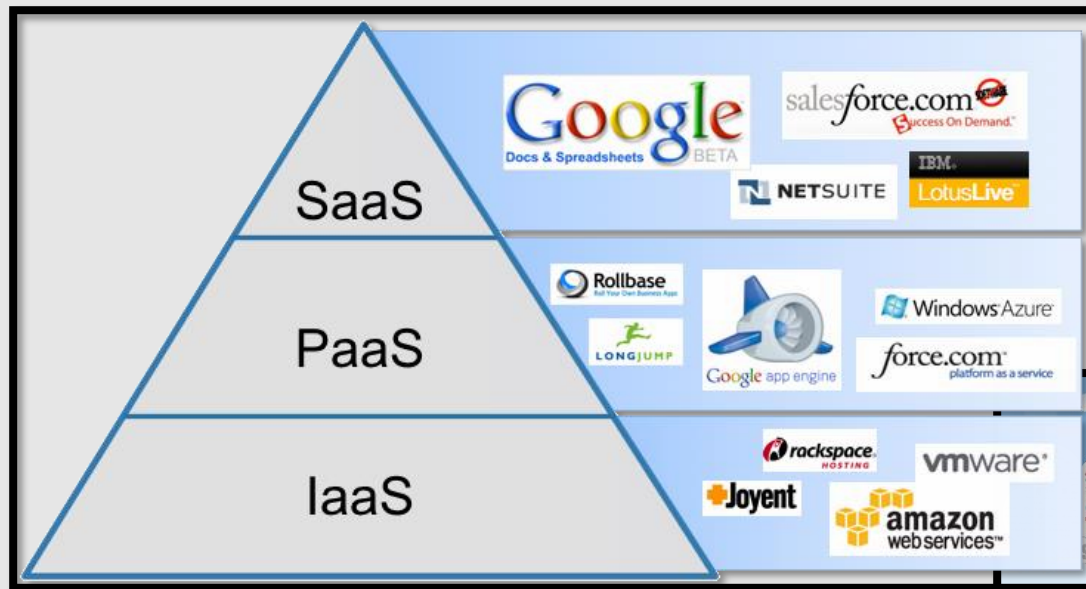
Cloud Providers

■ 2011



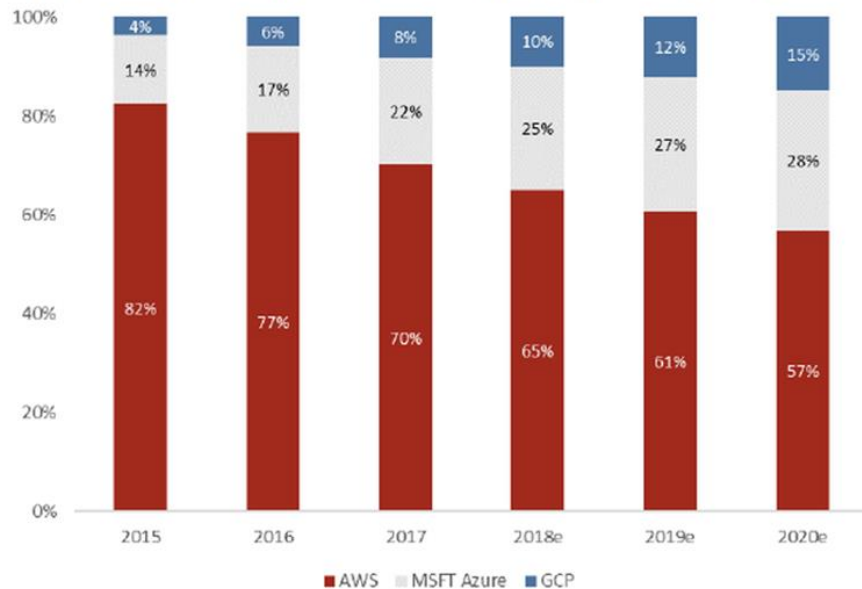
Cloud Providers

■ 2015



Cloud Providers

Market share among the major Clouds – expecting share gains from GCP



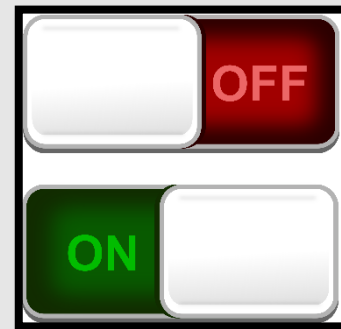
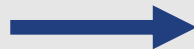
Source: Jefferies, Company reports



Advantages

Advantages

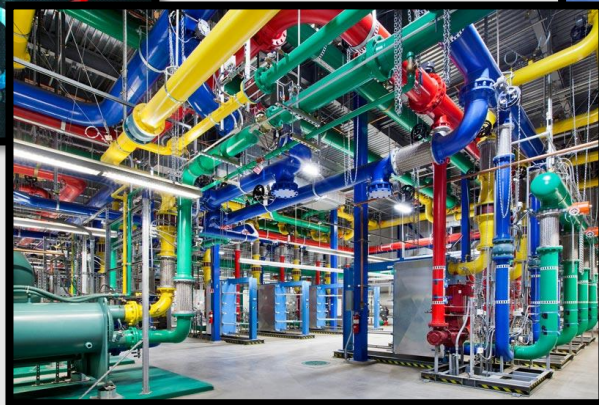
- Quick provision of the infrastructure



Advantages

Project Natick

■ Out of the box Infrastructure security



Advantages

■ Increased Availability and Reliability

Cloud Reliability



99,5 %

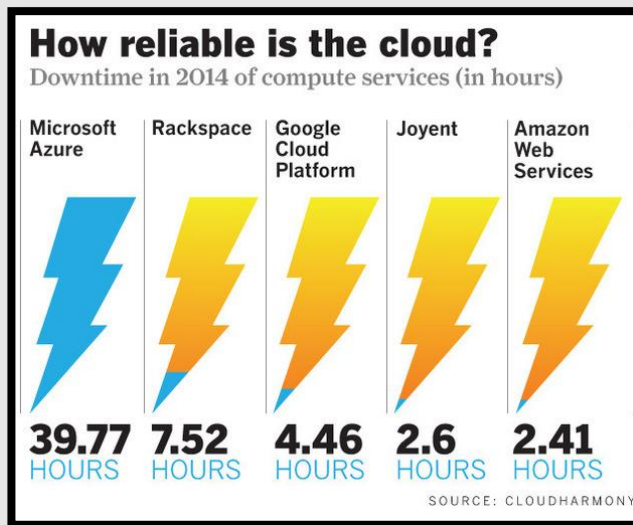
Source: <http://itbusinessedge.com>

Traditional Data Center Reliability



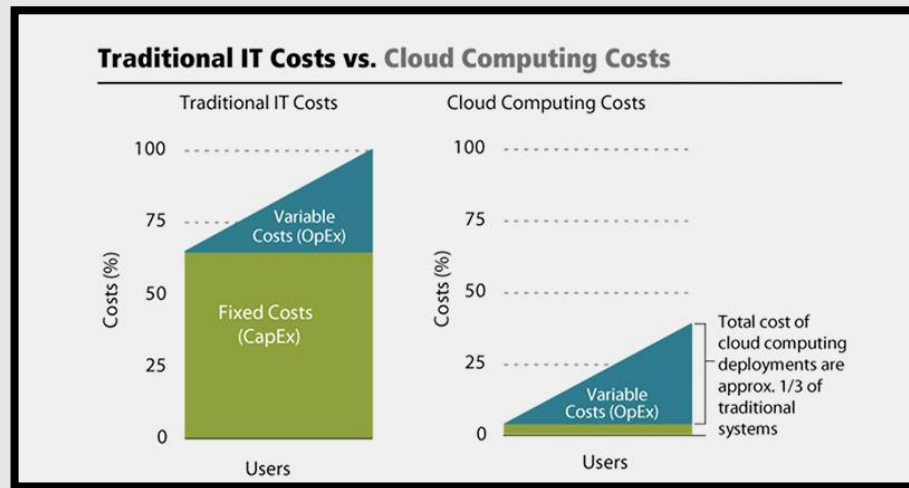
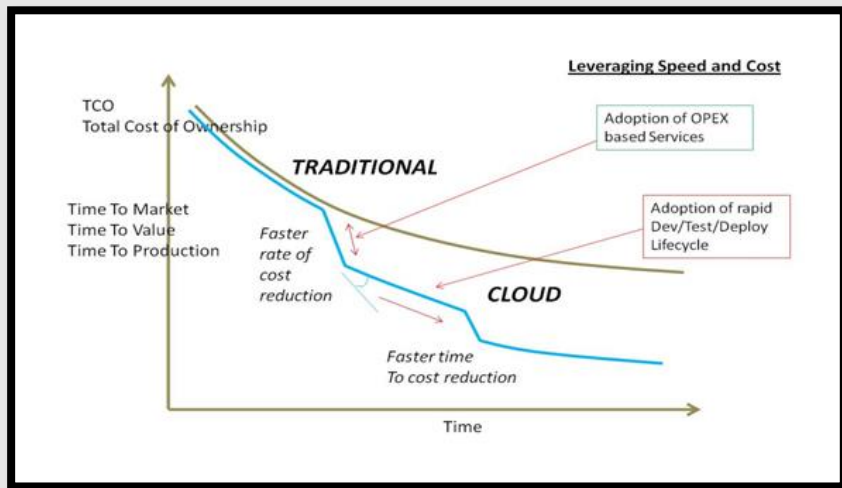
98,5 %

Source: cloudtweaks.com



Advantages

■ Reduced Investments and Proportional Costs



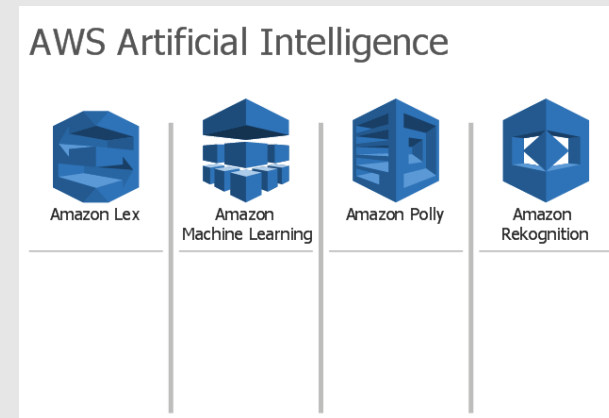
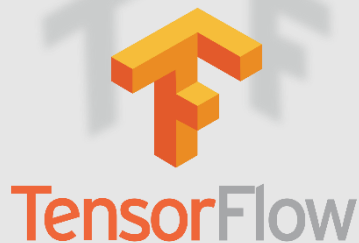
Advantages

- Pay per Use



Advantages

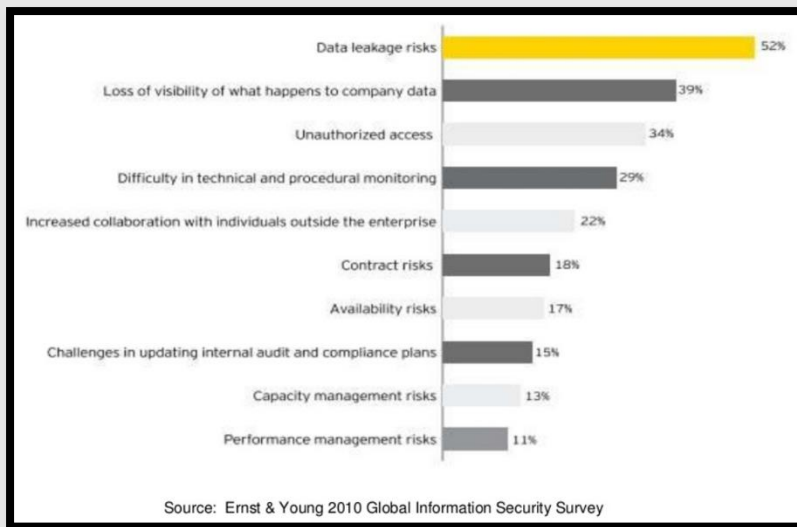
- **Amazing SaaS Services**



Disadvantages

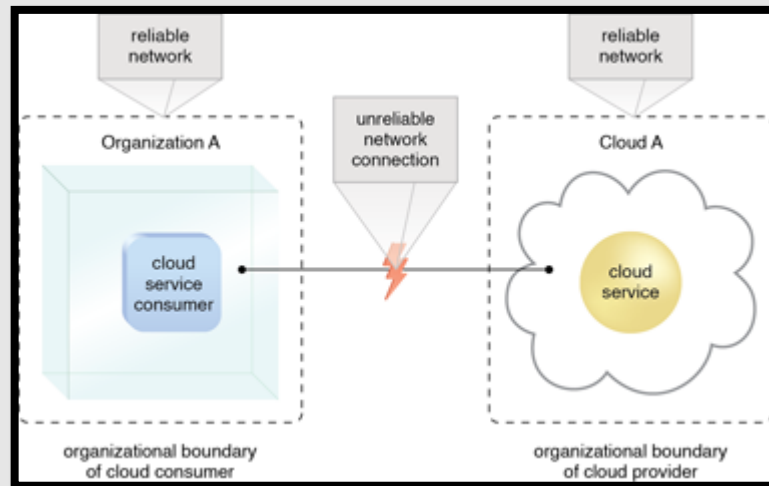
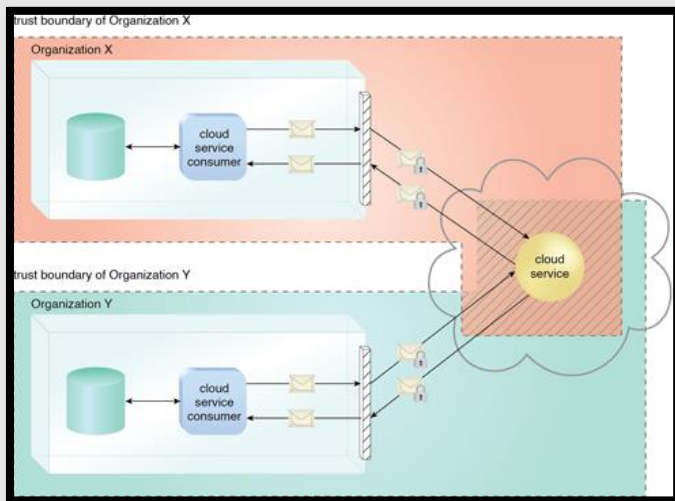
Disadvantages

■ Increased Security Vulnerabilities



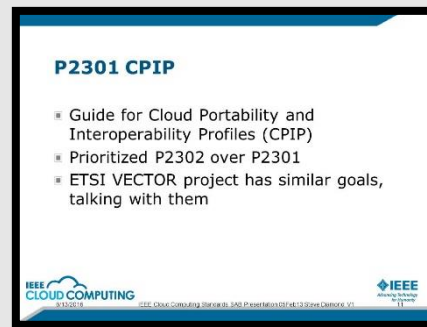
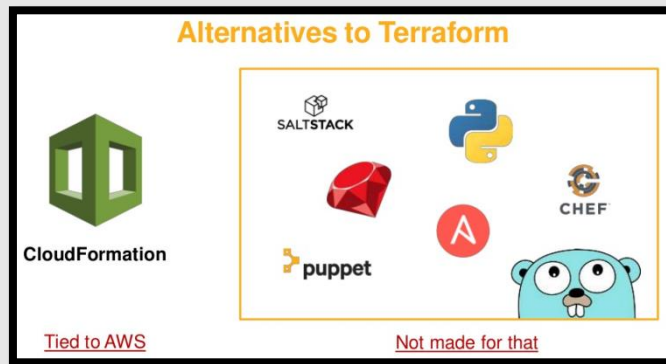
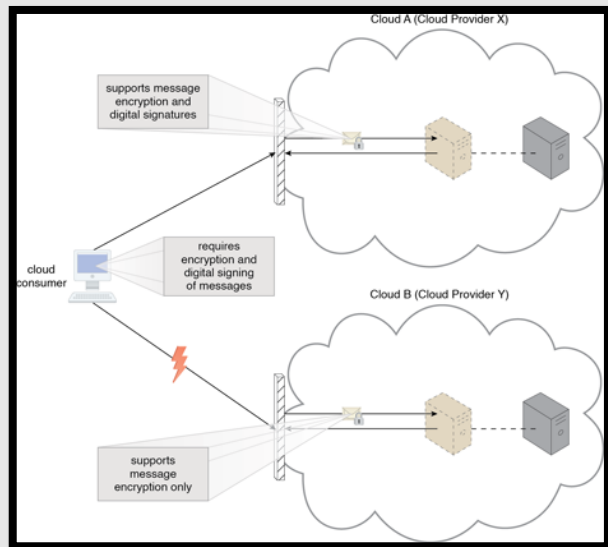
Disadvantages

▪ Reduced Operational Governance Control



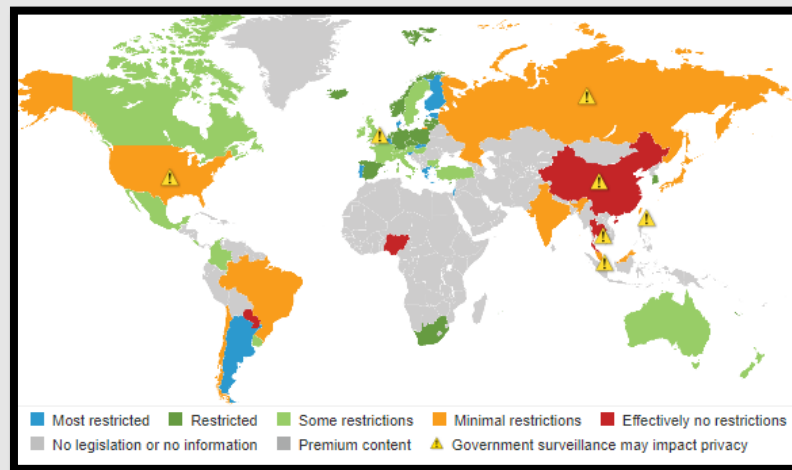
Disadvantages

▪ Limited Portability between Cloud Providers



Disadvantages

▪ Multi-Regional Regulatory and Legal Issues



Let's see them in action!

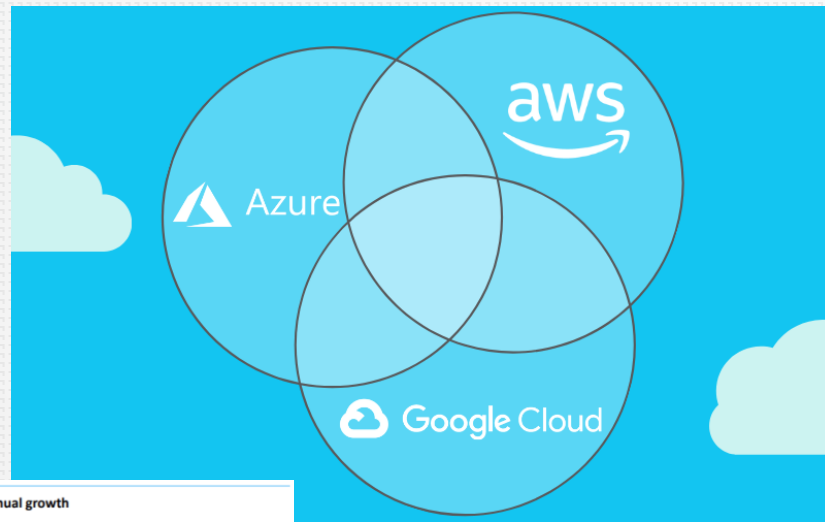


Google Cloud

Introduction

During last months you have seen multiple technologies now is time we talk about platforms.

In GFT we define ourselves as cloud provider agnostic, but for training purpose we will use GCP as main provider.



Worldwide cloud infrastructure spending and annual growth
Canalys estimates, Q4 2019

Cloud service provider	Q4 2019 (US\$ billion)	Q4 2019 market share	Q4 2018 (US\$ billion)	Q4 2018 market share	Annual growth
AWS	9.8	32.4%	7.3	33.4%	33.2%
Microsoft Azure	5.3	17.6%	3.3	14.9%	62.3%
Google Cloud	1.8	6.0%	1.1	4.9%	67.6%
Alibaba Cloud	1.6	5.4%	1.0	4.4%	71.1%
Others	11.6	38.5%	9.3	42.4%	24.4%
Total	30.2	100.0%	22.0	100.0%	37.2%



Note: percentages may not add up to 100% due to rounding
Source: Canalys Cloud Channels Analysis, January 2019

Compute



Compute Engine



App Engine



Container Engine



Container Registry



Cloud Functions

Identity & Security



Cloud IAM



Cloud Resource Manager



Cloud Security Scanner



Cloud Platform Security

Networking



Cloud Virtual Network



Cloud Load Balancing



Cloud CDN



Cloud Interconnect



Cloud DNS

Big Data



BigQuery



Cloud Dataflow



Cloud Dataproc



Cloud Datalab



Cloud Pub/Sub



Genomics

Storage and Databases



Cloud Storage



Cloud Bigtable



Cloud Datastore



Cloud SQL



Persistent Disk

Machine Learning



Cloud Machine Learning



Vision API



Speech API



Natural Language API



Translation API



Jobs API

Management Tools



Stackdriver



Monitoring



Logging

Error
Reporting

Trace



Debugger

Deployment
ManagerCloud
EndpointsCloud
ConsoleCloud
ShellCloud Mobile
AppBilling
App

Cloud APIs

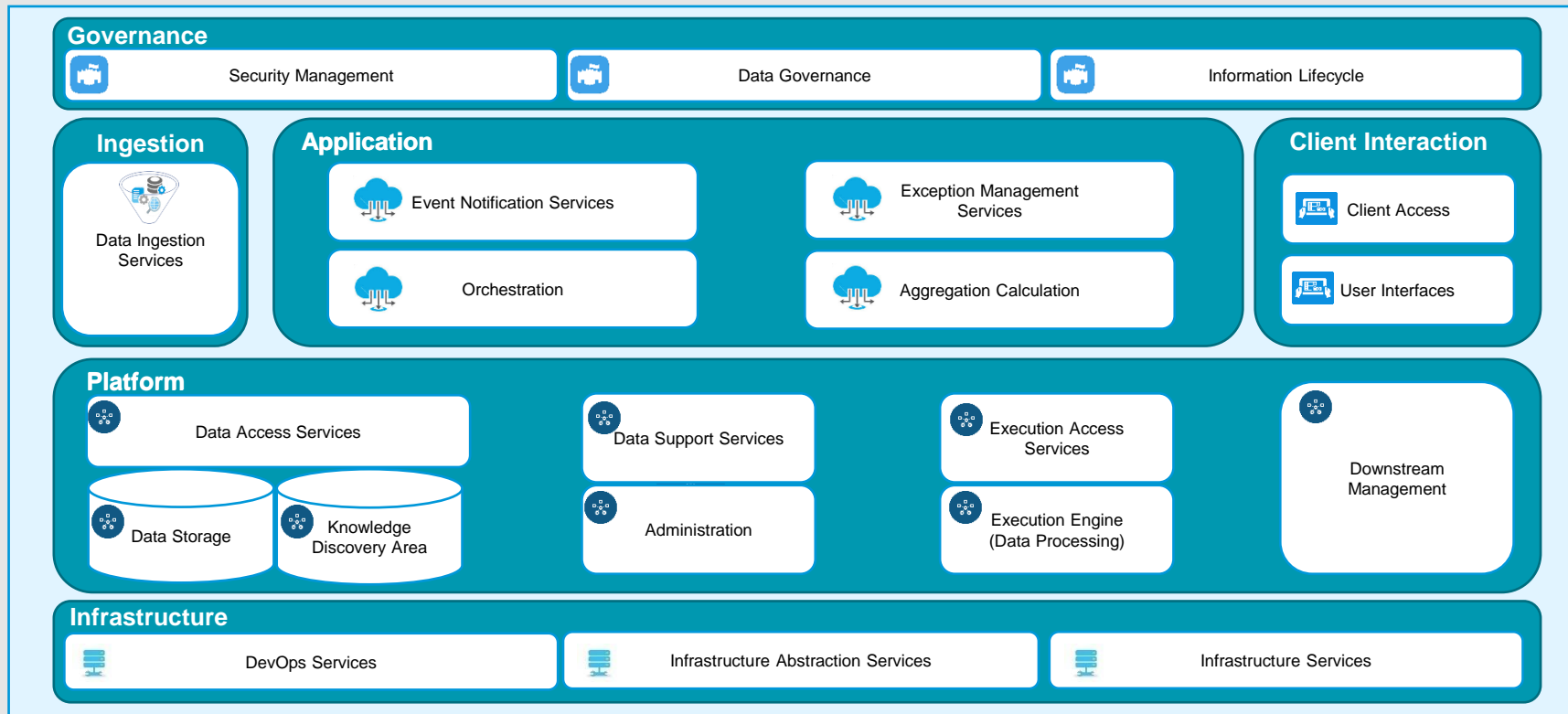
Developer Tools



Cloud SDK

Deployment
ManagerCloud Source
RepositoriesCloud Tools for
Android StudioCloud Tools
for IntelliJCloud Tools for
PowerShellCloud Tools for
Visual StudioGoogle Plug-in
for EclipseCloud Test
Lab

Data Reference Architecture



Technologies

Governance

Apache Ranger



Apache Atlas

cloudera navigator



TRILLIUM
SOFTWARE

Ingestion



ORACLE
FUSION MIDDLEWARE
GOLDENGATE



Application



Client Interaction



Platform



Infrastructure



kubernetes



OPENSIFT



Jenkins



Sonatype
Nexus

As a summary...

What you have seen in DLP

Ingestion



Processing



Storage



Analysis



The mapping in Cloud (GCP)



Ingestion



IoT Core

Processing



Cloud
Pub/Sub

Cloud
Dataproc

Cloud
Dataflow

Storage



Cloud
Bigtable

Cloud SQL

Analysis



Cloud
Datalab

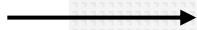
Vendors as a service

- Even though GCP provides similar services, in order to facilitate adoption and reduce vendor lock-in, they also provide **third party's software as a service**.

SOLUCIONES DE PARTNERS



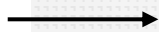
Redis Enterprise



In-memory database



Apache Kafka on Co...



Streaming platform (messaging)



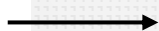
DataStax Astra



NOSQL (columnar) database



Elasticsearch Service



Index/text-search store



MongoDB Atlas



NOSQL (document) database

Shaping the future of digital business