Infrastructure and Application Modernization with Google Cloud
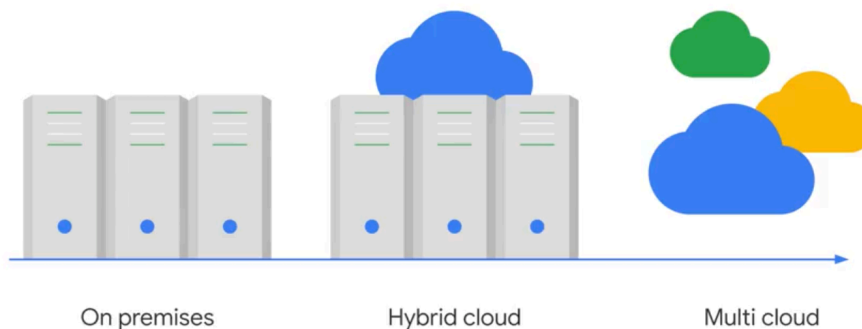
Modernizing IT infrastructure with Google Cloud

On premises   Hybrid cloud   Multi cloud

Modernizing IT infrastructure

Virtual machines optimize the use of available resources and enable businesses to have multiple applications running at the same time on the server

Many companies are now outsourcing their infrastructure

Advantages of using public Cloud serves

1. On demand Service
2. Broad network access
3. Resource pouting
4. Rapid elasticity
8. Measured sew

IaaS, PaaS

Easier to shift a larger proportion of company expertise to build processes and applications that move business forward
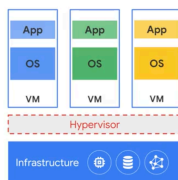
Computing = machine's ability to process information

Available compute options

shares same pool of computer processing, storage, and networking resources

Virtual Machine
resource optimization that allows multiple systems to run on the same hardware

App	App	App
OS	OS	OS
VM	VM	VM
Hypervisor		
Infrastructure		

Recreate full representation of the HW

Containerization
start faster
useless memory
predictable environment

App	App	App
Container orchestration		
Operating system		
Infrastructure		
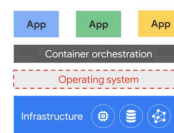
Only recreate / virtualizes the OS

Can run on..
Linux I window I MacOS
UM, Bare metal,
Developer's machine
On-premises data centre
public cloud

Serverless Computing
"server less "means that resources such as computing power are automatically provisions behind the scenes as needed

FaaS

function as a service!

Improve agility, strengthen security
Optimize resources, managing application

Private, hybrid and multi-cloud architectures

Reliability and resilience of cloud infrastructure is Critical to business operations and success
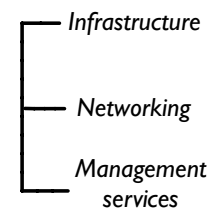
Private Cloud   **Hybrid Cloud**   **Multi cloud**

Google Cloud global infrastructure

Google Cloud VMware Engine: Fully managed service that lets User run VMware platform in Google would

Google Cloud = carbon free

— *Infrastructure*

— *Networking*

— *Management services*

Infrastructure and Application Modernization with Google Cloud

Application Modernization

Five common change patterns to modernize applications

1) Move applications first and then change them

2) change applications before they more

3) Invent in green field
→ Allow building innovative applications that will help drive business forward. But it requires agility, access to a diverse development skill set

4) Invent in brownfield
→ inventing new application in cloud environment that will replace an existing legacy application

5) move applications without any changes

Application development challenges

Building new applications in cloud → more agile in development

Micro service Architecture can reduce problems when we need to build new applications or modernizing existing ones.

⇒ This type of architecture involves the separation of a large Application into small, loosely-coupled services.

CI/CD pipeline
continuous Integration / Continuous Delivery

- increase application release Velocity & reliability

- enables to lower risk of regressions, debug issues quickly, roll back to the last stable build if necessary

Containerization

In the context of application development, containerization allows developers to divide an application design into individual compartments. The advantage is that parts of the code can be updated without affecting the whole application

The advantage is that parts of the code can be updated without affecting the whole application

It also builds resilience because one error doesn't impact the whole application

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Google Kubernetes Engine and App Engine

GKE enables rapid application development & iteration by making it easy to deploy

Kubernetes : open-source container orchestration system for automating computer application deployment, scaling & management.

App engine : leverages sever less computing to enable businesses to develop applications

platform for building scalable web applications and mobile back-ends

Manages HW & networking infrastructure required to run code

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Application Programming Interface

Legacy systems challenge

Legacy systems and applications are complex, expensive to maintain, and do not provide the speed and scale required to deliver seamless, digital experiences that consumers now expect.

i.e. HR/employee management system, Banking system, databases, data warehouses, data lakes, etc.

* Legacy systems weren't developed to support the implementation & adoption of modern technologies such as cloud or IoT or mobile application

* Legacy systems are not designed to serve Real-time data

∴ Legacy system tends to hold organizations back from using digital technologies to innovate or improve IT efficiency

API to modernize legacy system

API is a piece of software that connects different applications and enables information to flow between systems. Ultimately, APIs enable integration between systems so businesses can unlock value and create new services

They do this by exposing data in a way that protects the integrity of the legacy systems and enable secure and governed access to the underlying data.

This allows organizations with older systems to adapt to modern business needs and more importantly, to quickly adopt new technologies and platforms.

APIs enable businesses to unlock value without re-architecting all of those legacy applications

I. e. Mobile Banking, where the app needs to show up-to-date account balance. The data that provides that information is stored in a legacy database. to connect that database to the end-user application, the bank creates an API that allows Information to flow between the application & legacy database seamlessly and securely

API to create new business values

API-first architecture → can build new digital ecosystems & create new business value

Digital Ecosystem: Group of interconnected companies & products

The more managements know about their customers, the better You're able to offer a truely integrated end-to-end digital experience

Apigee

Infrastructure & legacy system gap

- legacy system provides business data but not features and capabilities at the rate of change demanded

Apigee : Fully featured API management platform that enables application development & API providers to create connected digital experiences for end-users

↳ Bridges the gap between legacy system

↳ Includes API services that provide the runtime API gateway functionality, Developer services that allow developers to utilize their APIs, and analytics services that enable enterprises to report on APIs

Apigee services