Managed Services

Managed Services

In28 Minutes

- Do you want to continue **running applications in the cloud**, the **same way you run them** in your **data center**?
- OR **are there OTHER approaches**?
- You should **understand some terminology** used with cloud services:
  - **IaaS** (Infrastructure as a Service)
  - **PaaS** (Platform as a Service)
  - **FaaS** (Function as a Service)
  - **CaaS** (Container as a Service)
  - **Serverless**
- Let's get on a quick **journey** to understand these!

IAAS (Infrastructure as a Service)

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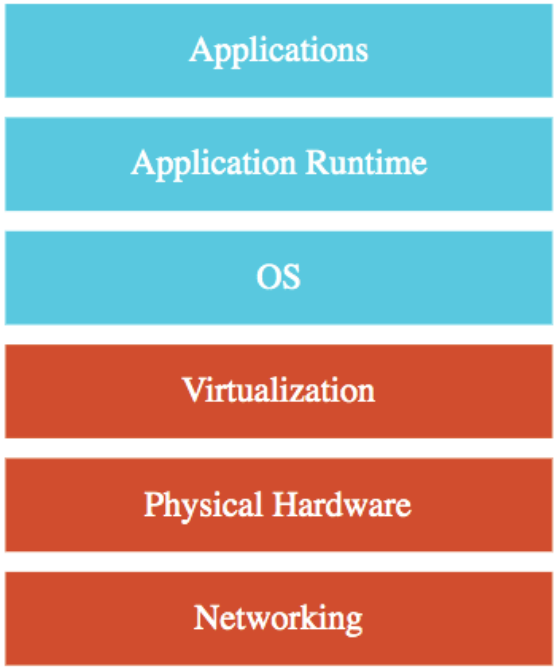
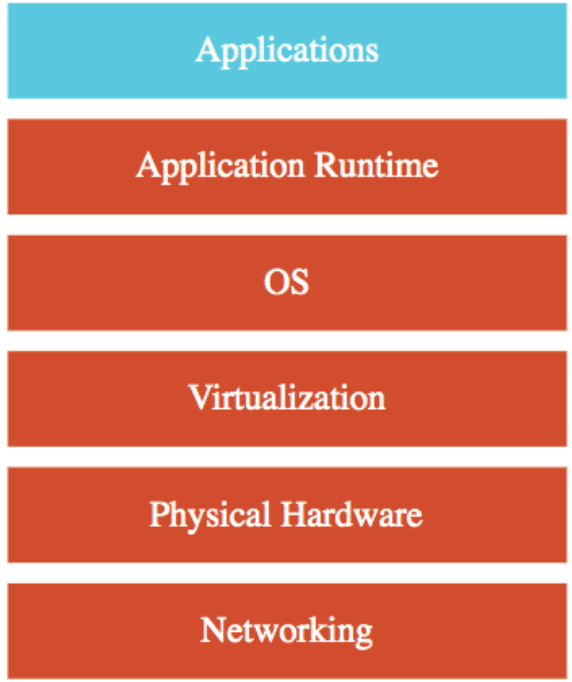
- Use **only infrastructure** from cloud provider
- **Example**: Using VM to deploy your applications or databases
- You are responsible for:
  - Application Code and Runtime
  - Configuring load balancing
  - Auto scaling
  - OS upgrades and patches
  - Availability
  - etc.. (and a lot of things!)



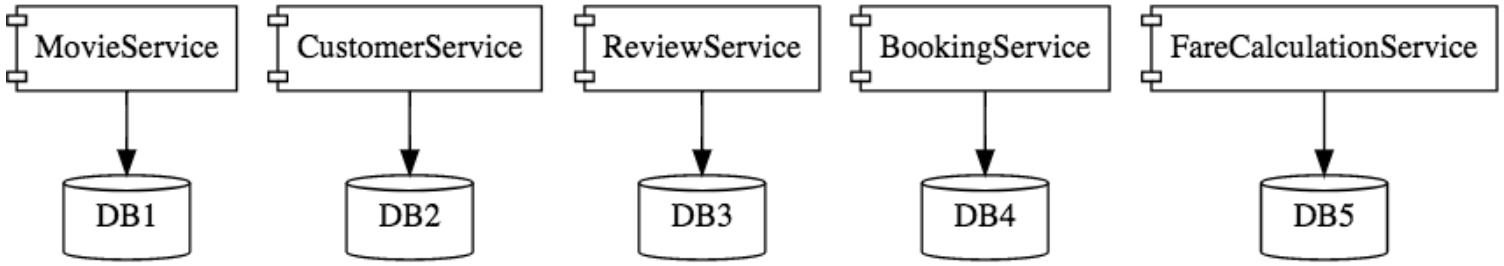
PAAS (Platform as a Service)

In28 Minutes

- Use a platform provided by cloud
- **Cloud provider** is responsible for:
  - OS (incl. upgrades and patches)
  - Application Runtime
  - Auto scaling, Availability & Load balancing etc..
- **You** are responsible for:
  - Configuration (of Application and Services)
  - Application code (if needed)
- Varieties:
  - **CAAS (Container as a Service)**: Containers instead of Apps
  - **FAAS (Function as a Service)**: Functions instead of Apps
  - Databases - Relational & NoSQL (Amazon RDS, Google Cloud SQL, Azure SQL Database etc), Queues, AI, ML, Operations etc!



Microservices

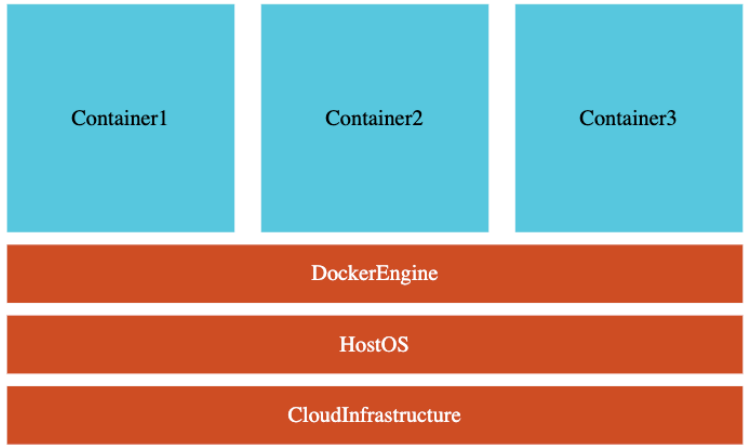


- Enterprises are heading towards microservices architectures
  - Build small focused microservices
  - **Flexibility to innovate** and build applications in different programming languages (Go, Java, Python, JavaScript, etc)
- BUT **deployments become complex**!
- How can we have **one way of deploying** Go, Java, Python or JavaScript .. microservices?
  - Enter **containers**!

Containers - Docker

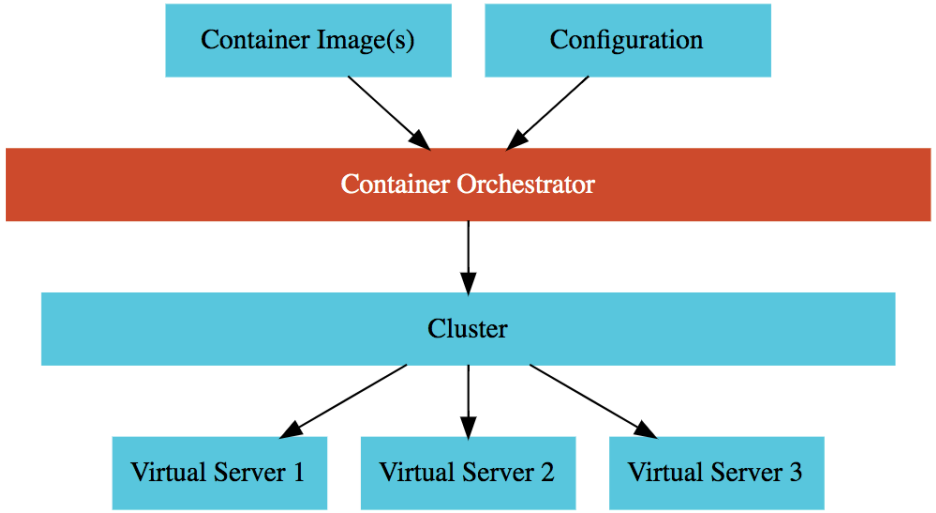
In 28 Minutes

- Create **Docker images** for each microservice
- Docker image **has all needs of a microservice:**
  - Application Runtime (JDK or Python or NodeJS)
  - Application code and Dependencies
- Runs **the same way** on any infrastructure:
  - Your local machine
  - Corporate data center
  - Cloud
- Advantages
  - Docker containers are **light weight**
    - Compared to Virtual Machines as they do not have a Guest OS
  - Docker provides **isolation** for containers
  - Docker is **cloud neutral**



Container Orchestration

- **Requirement** : I want 10 instances of Microservice A container, 15 instances of Microservice B container and ....
- Typical Features:
  - **Auto Scaling** - Scale containers based on demand
  - **Service Discovery** - Help microservices find one another
  - **Load Balancer** - Distribute load among multiple instances of a microservice
  - **Self Healing** - Do health checks and replace failing instances
  - **Zero Downtime Deployments** - Release new versions without downtime



Serverless

In 28 Minutes

- What do we think about when we develop an application?
  - Where to deploy? What kind of server? What OS?
  - How do we take care of scaling and availability of the application?
- **What if you don't need to worry about servers and focus on your code?**
  - Enter **Serverless**
    - Remember: **Serverless does NOT mean "No Servers"**
- **Serverless for me**:
  - You **don't worry** about infrastructure (ZERO visibility into infrastructure)
    - Flexible scaling and automated high availability
  - Most Important: **Pay for use**
    - Ideally ZERO REQUESTS => ZERO COST
- **You focus on code** and the cloud managed service takes care of all that is needed to scale your code to serve millions of requests!
  - And you pay for requests and NOT servers!

GCP Managed Services for Compute

In28 Minutes

Service	Details	Category
Compute Engine	High-performance and general purpose VMs that scale globally	IaaS
Google Kubernetes Engine	Orchestrate containerized microservices on Kubernetes Needs advanced cluster configuration and monitoring	CaaS
App Engine	Build highly scalable applications on a fully managed platform using open and familiar languages and tools	PaaS (CaaS, Serverless)
Cloud Functions	Build event driven applications using simple, single-purpose functions	FaaS, Serverless
Cloud Run	Develop and deploy highly scalable containerized applications. Does NOT need a cluster!	CaaS (Serverless)