



CLOUD COMPUTING APPLICATIONS

Serverless Cloud Computing:
Landscape

Prof. Reza Farivar

Serverless Cloud Computing Landscape

- Different Categories of Serverless Computing
 - Compute
 - Platform as a Service (Apps)
 - Function as a Service (Functions)
 - Container as a Service (Containers)
 - Storage
 - Blobs (Binary Large Objects)
 - Key/Value Datastores
 - Analytics
 - AI and ML

Compute: PaaS

- The unit of compute is a full App
- You still select which server / platform you need, only that you don't need to manage it anymore
- Amazon Elastic BeanStalk
- Google AppEngine
- Microsoft Azure App Service
- IBM CloudFoundry
 - Based on Open Source CloudFoundry
 - Originally developed by VMware, transferred to Pivotal Software (a joint venture by EMC, VMware and General Electric), brought back into VMware at the end of 2019
- Oracle Java Cloud Service

Function as a Service

- This is what most people think of as “Serverless”
- Unit of compute is a function
 - Functions running when “events” are triggered
- Amazon AWS Lambda
- Microsoft Azure Functions
- Google Cloud Functions
- IBM Cloud Functions
 - Based on Apache Open Whisk
- Oracle Functions
 - Apache Fn
- Open Source Open Lambda

Container as a Service

- Function as a Service on HEAVY steroids!
 - Containers have to be Stateless
 - Unit of compute is a whole container
 - Container running when “events” are triggered
- Amazon Elastic Container Service (ECS), Elastic Kubernetes Service (EKS), Fargate
- Microsoft Azure Kubernetes Service (AKS)
 - Built on top of Open Source KEDA
- Google Cloud Run, Anthos
 - Built on top of Open Source Knative
 - Kubernetes-based platform to deploy and manage modern serverless workloads.
- IBM Cloud Kubernetes Service
- Oracle Container Engine for Kubernetes
- Open Source Kubernetes
 - Google Borg

Serverless Storage: Blobs

- Blob Storage
 - Amazon Simple Storage Service (S3)
 - Microsoft Azure Blob Storage
 - IBM Object Storage
 - Google Cloud Storage
 - Oracle Object Storage

Serverless Storage: Key/Value Database

- Distributed NOSQL key/value storage service
- Amazon DynamoDB
- Microsoft Azure Cosmos DB
- Google Cloud Datastore, Firestore, Cloud BigTable
- IBM Cloudant
- Open Source: Cassandra