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AWS EKS : AMAZON ELASTIC KUBERNETES SERVICE

A series of white diagonal lines of varying lengths and thicknesses, located in the bottom right corner of the slide.



A container is a lightweight, virtualised, portable software which can package an entire runtime environment :
Application, plus all its dependencies, libraries binaries and configuration files needed to run it.

CONTAINERS

BENEFITS

➤ Portability

Applications can be deployed easily to multiple different operating systems and hardware platforms. (e.g. on-premise / cloud)

▶ Consistency

Applications will run the same regardless of their deployment environment.(e.g. development/ test/ production)

▶ Easy to scale

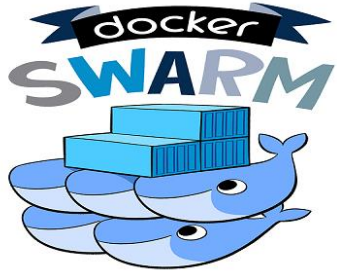
Applications can be easily scaled up by spinning more containers.

▶ Isolation

Since the containers run in isolation, any failure / security breach of a running instance won't affect the other containers.



kubernetes



MESOS



Amazon
ECS

A container orchestrator is a utility that is designed to automate provisioning and management of containers, especially in large, dynamic environments .

CONTAINER ORCHESTRATORS



Provisioning and deployment of containers



Scaling up or Scaling down containers(based on load)



External exposure of services running in a container with the outside world



Load balancing and service discovery between containers



Health monitoring of containers and hosts



Configuration of an application in relation to the containers running it



Allocation of resources between containers

BENEFITS / USAGE

KUBERNETES



An augmented reality game developed by Niantic for Android and iOS devices.



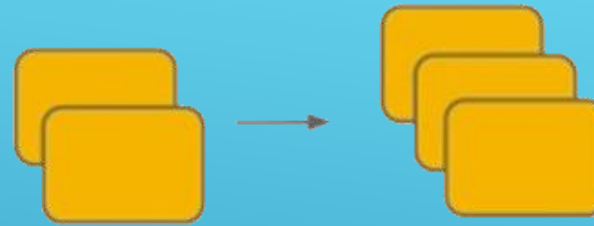
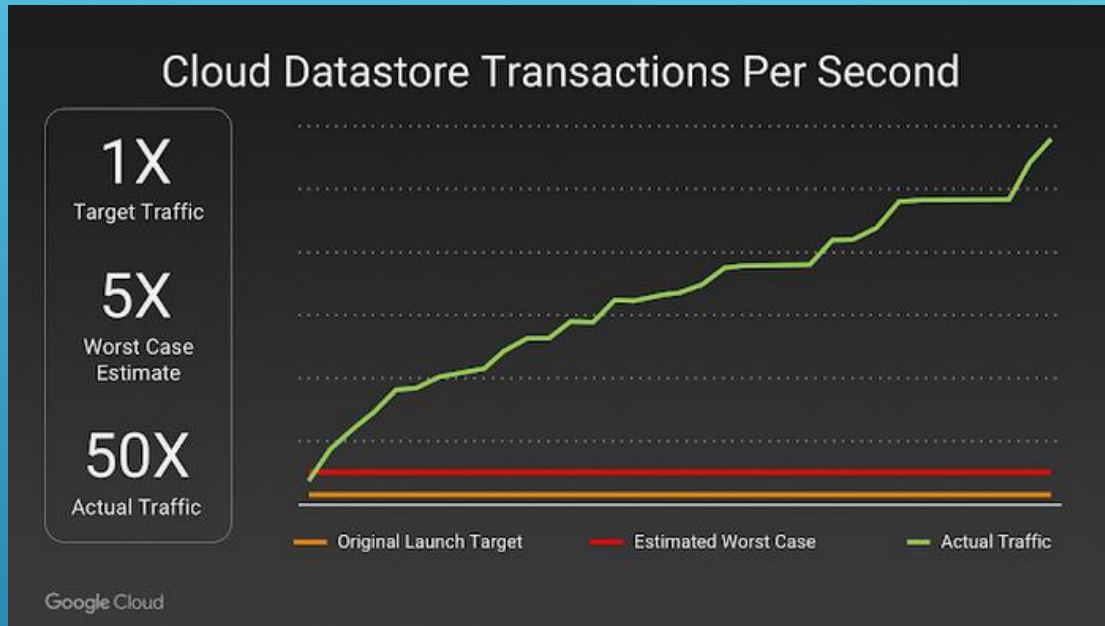
500+ million download and
40+ million daily active users

} in the first weeks after go live

Exceeded engineering expectations by
50 times

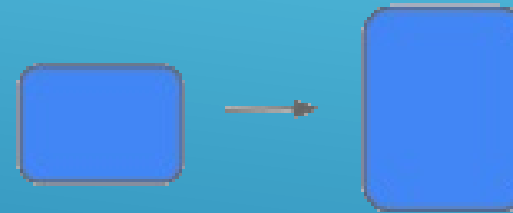
KUBERNETES @ POKEMON GO

an example of what you can do with Kubernetes...



Horizontal

and



Vertical

Scaling at ease

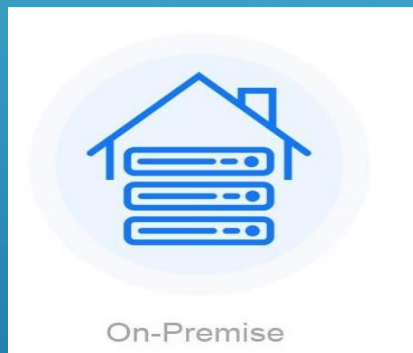
KUBERNETES @ POKEMON GO

an example of what you can do with Kubernetes...

KUBERNETES OPTIONS



kubernetes



Amazon
EKS



Amazon Elastic Kubernetes Service (Amazon EKS) is a fully managed Kubernetes service that makes it easy for you to run Kubernetes on AWS.

WHAT IS AWS – EKS ?

EKS: DEMONSTRATION



Create a Spring Boot application

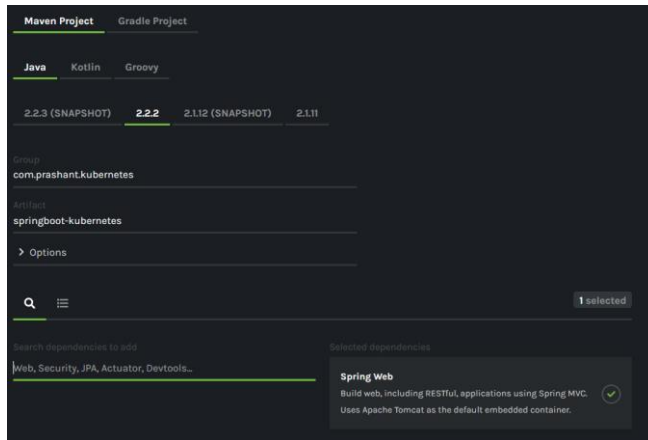
```
graph TD; A[Create a Spring Boot application] --> B[Dockerize it and push the docker image to a public repo]; B --> C[Set-up EKS Environment on AWS.]; C --> D[Deploy Application on EKS.];
```

Dockerize it and push the docker image to a public repo

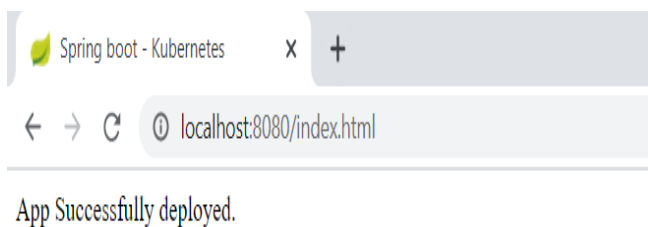
Set-up EKS Environment on AWS.

Deploy Application on EKS.

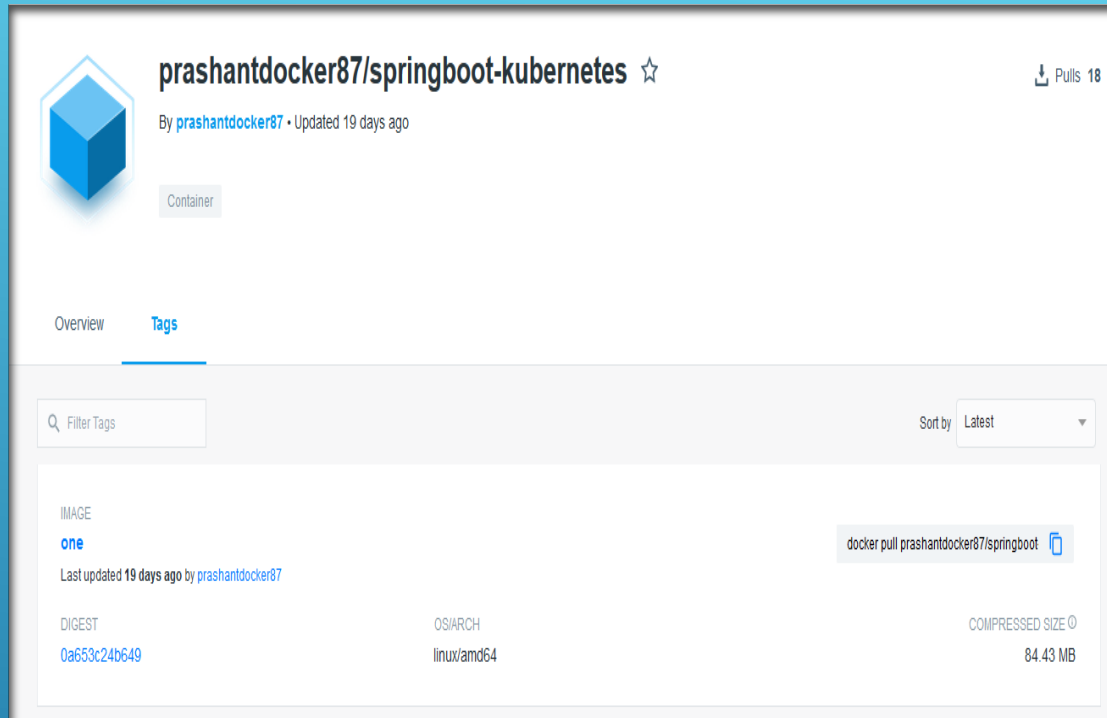
IMPLEMENTATION STEPS



- ▶ Use Spring Initializer to create a sample application
- ▶ Create Welcome page and run the application
- ▶ Source code: [GitHub](#)



APPLICATION USING SPRING BOOT



- ▶ Create Docker image

docker build -t springboot-kubernetes .

- ▶ Tag Docker Image

**docker tag springboot-kubernetes:latest
[docker public repo]/springboot-
kubernetes:one**

- ▶ Push Docker Image

**docker push [docker public
repo]/springboot-kubernetes:one**

DOCKERIZATION

AWS-EKS PRE-REQUISITES

- ▶ AWS Account

<https://aws.amazon.com/account/>

- ▶ Install Kubectl

<https://kubernetes.io/docs/tasks/tools/install-kubectl/>

- ▶ Install AWS CLI

<https://docs.aws.amazon.com/cli/latest/userguide/install-cliv1.html>

- ▶ Prefer aws cli version 1

IAM Service Role

- Create EKS Service role
- Add ec2:DescribeAccountAttributes inline policy

Create VPC Stack

- Create VPC stack using cloudformation
- Note values of Security group id, Subnet id, VPC ID

EKS Cluster Setup

- Navigate to EKS console and create a cluster using the created VPC and IAM Service Role

EKS Worker Nodes Setup

- Create IAM Role for worker node using cloud formation
- Choose **Configure node group** option on EKS cluster and provision the necessary worker node resources

Kubectl

- Connect to Kubernetes cluster using kubectl
- Deploy application using kubectl and expose it as a service of type LoadBalancer

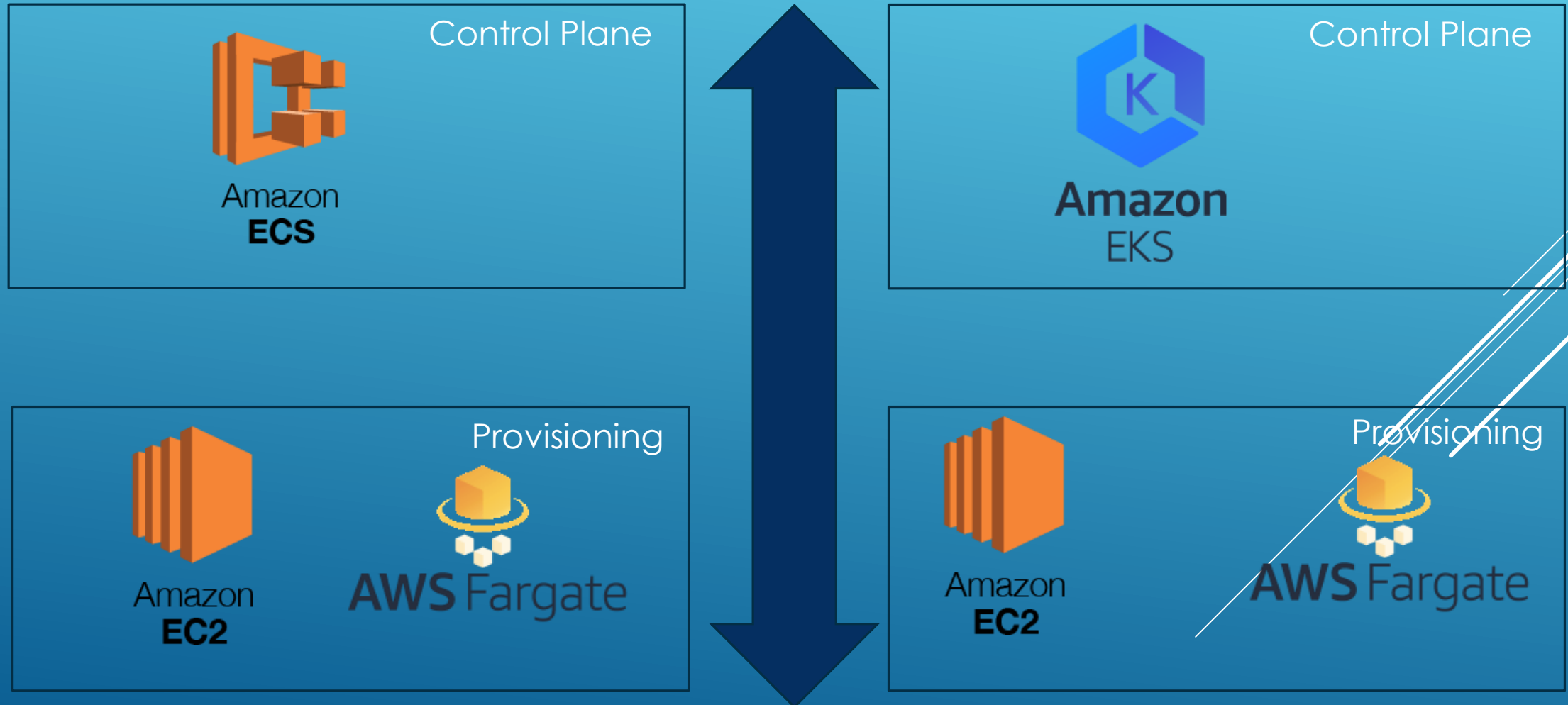
EKS SETUP

DEMO

EKS ALTERNATIVES ON AWS?



AWS Container Services





Amazon
ECS

Container Orchestration tool,
created by AWS

Requires Creating a cluster

Control Plane: No Cost
Worker Nodes: Pay as per usage and type

Requires managing the Worker nodes

More suitable when you prefer an AWS
Specific solution and want to manage
Worker nodes on your own.



Amazon
EKS

Managed Kubernetes(Open Source)
Platform on AWS

Requires Creating a cluster

Control Plane : 0.10 \$ per hour (In US)
WorkerNodes : Pay as per usage and type

Requires managing the Worker nodes

More suitable when you want to use
Kubernetes and would also want to support
multi-cloud or on-premise deployments



AWS Fargate

Containers On Demand, created by AWS

Cluster creation not required

Only pay for tasks based on CPU and memory

No need to manage worker nodes

More suitable when you prefer an AWS
Specific solution want to a run a
time specific load .

RESOURCES

- ▶ AWS EKS

<https://aws.amazon.com/de/eks/>

- ▶ Cloud Formation

<https://aws.amazon.com/de/cloudformation/>

- ▶ Blog

<https://prashant-hariharan.blogspot.com/2019/12/kubernetes-with-eks.html>



QUESTIONS?

