Automating Docker on AWS

March 29, 2017
Sydney Docker User Group

Taylor Bertie
Marcus Santos

amazon web services

Agenda

Docker and AWS

EC2 Container Service (ECS) Overview

ECS Integration with AWS products

Demo

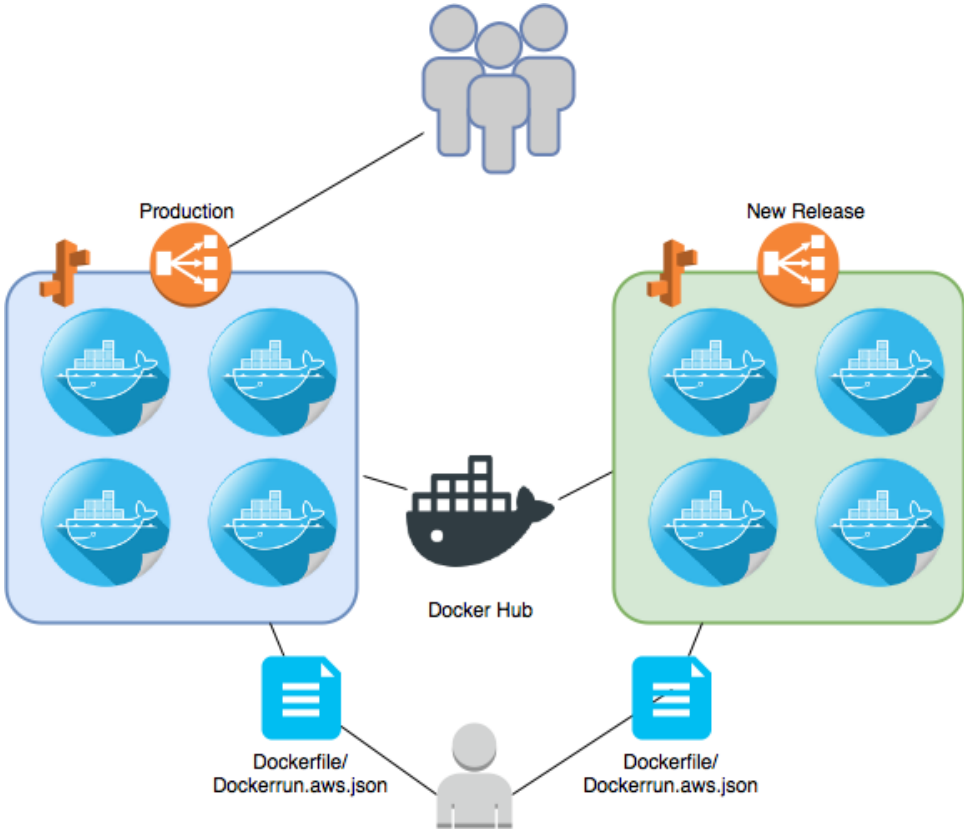
ECS Best Practices

Docker Solutions from AWS

- Elastic Beanstalk
- AWS Batch
- EC2 Container Service

amazon web services

Deploying Docker containers using Elastic Beanstalk



amazon web services

AWS Batch

Dashboard

Job status

Submit job

Queue name (priority)	Submitted	Pending	Runnable	Starting	Running	Failed	Succeeded
test-queue (500)	1	1	1	1	1	1	1
production-queue (1000)	1231	942	12	104020	57	17	8742

Job queues

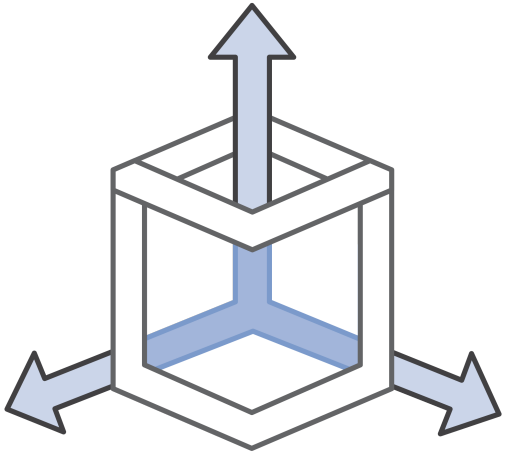
Name	Priority	Pending job count	Running job count	Registered instance count	Total vCPUs
test-queue	500	1	1	1	4
production-queue	1000	942	104202	20	96

Compute environments

Name	Type	Running job count	Desired vCPUs	Registered instance cou
spot-env	managed	1002301	1600	100
production	unmanaged	12	1000	100

amazon web services

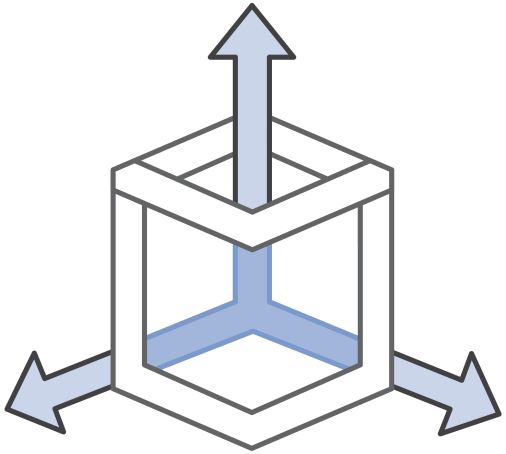
EC2 Container Service



- Eliminates cluster management software
- Manages cluster state
- Manages containers
- Control and monitoring
- Scale from one to tens of thousands of containers

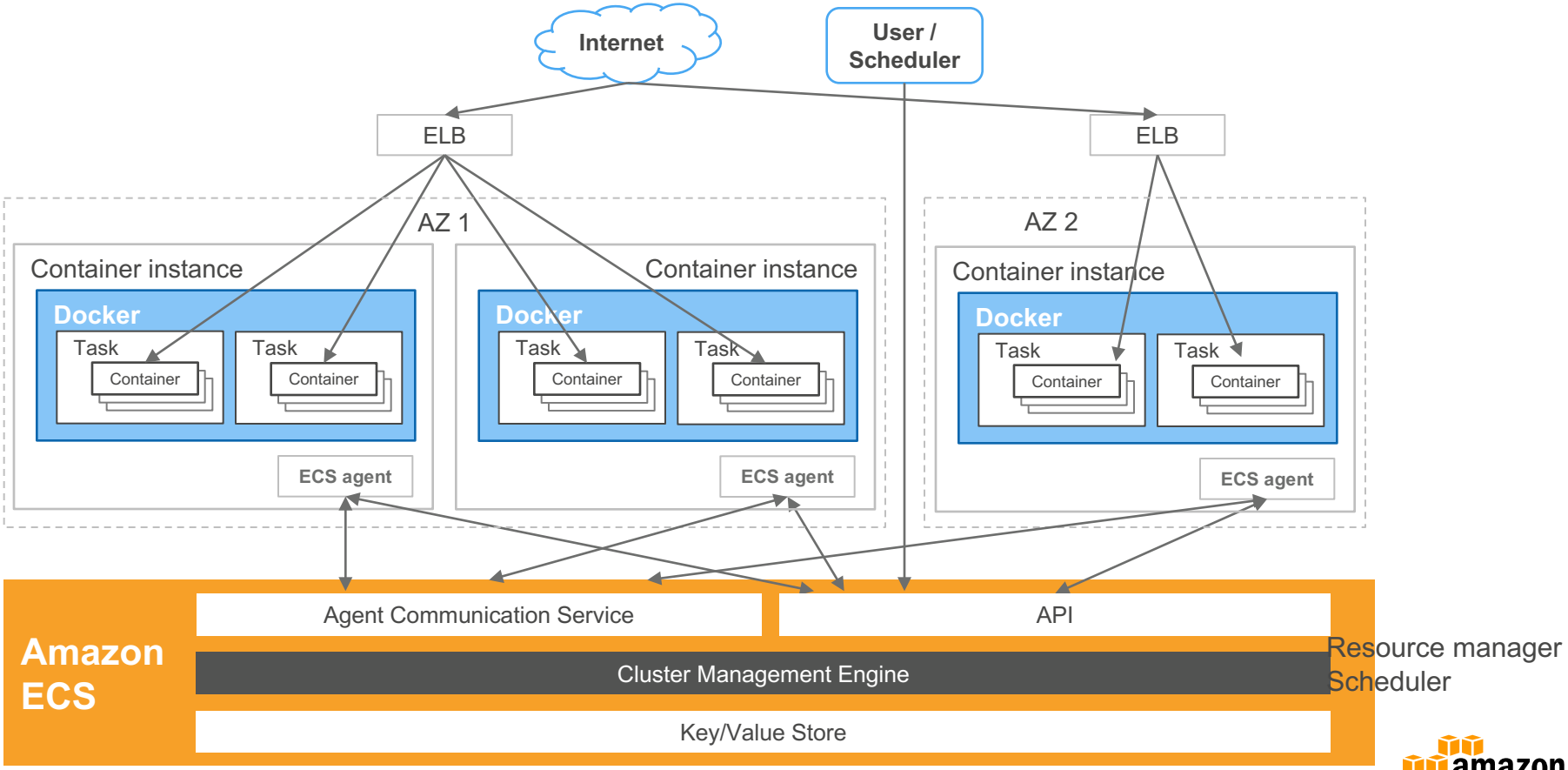
amazon web services

EC2 Container Service terminology.

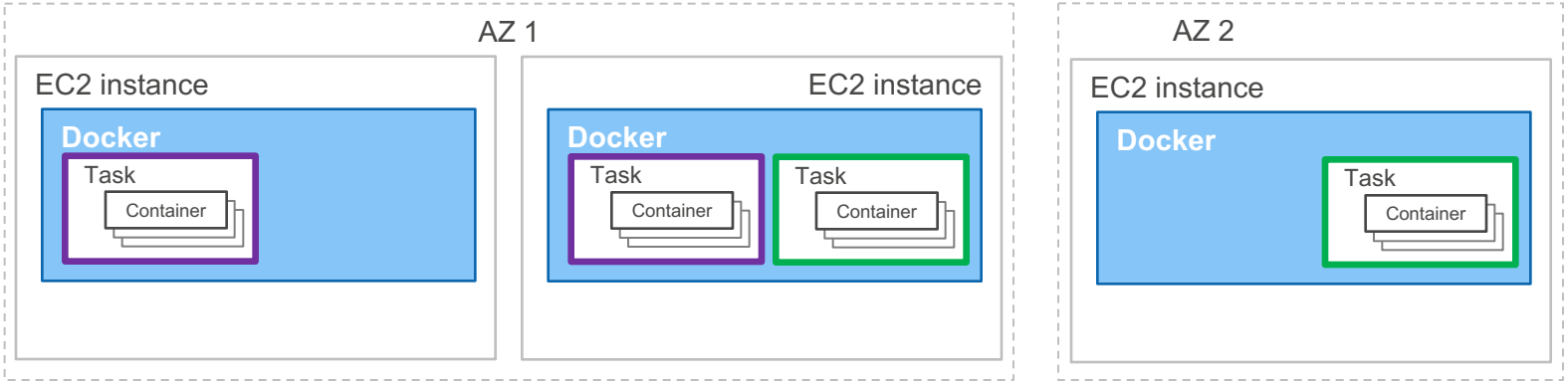


- Task Definition → Docker Compose
- Task → Running Container
- EC2 Container Registry → Docker Hub

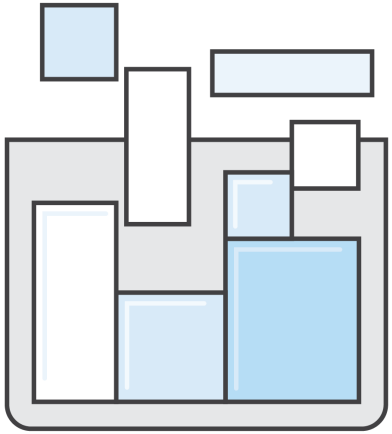
Amazon ECS


Internet
User / Scheduler
ELB
ELB
AZ 1
AZ 2
Container instance
Container instance
Container instance
Docker
Task
Container
ECS agent
Amazon ECS
Agent Communication Service
API
Cluster Management Engine
Key/Value Store
Resource manager
Scheduler

Cluster management: Scheduling

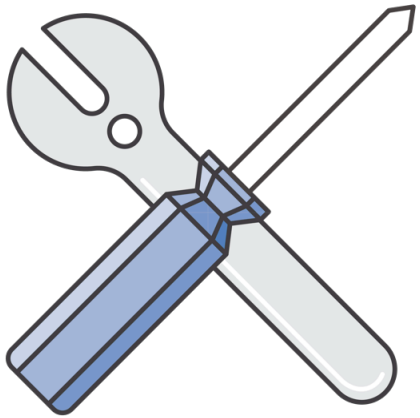


Flexible container placement



- Applications / Services
- Batch jobs /RunTask
- Multiple schedulers

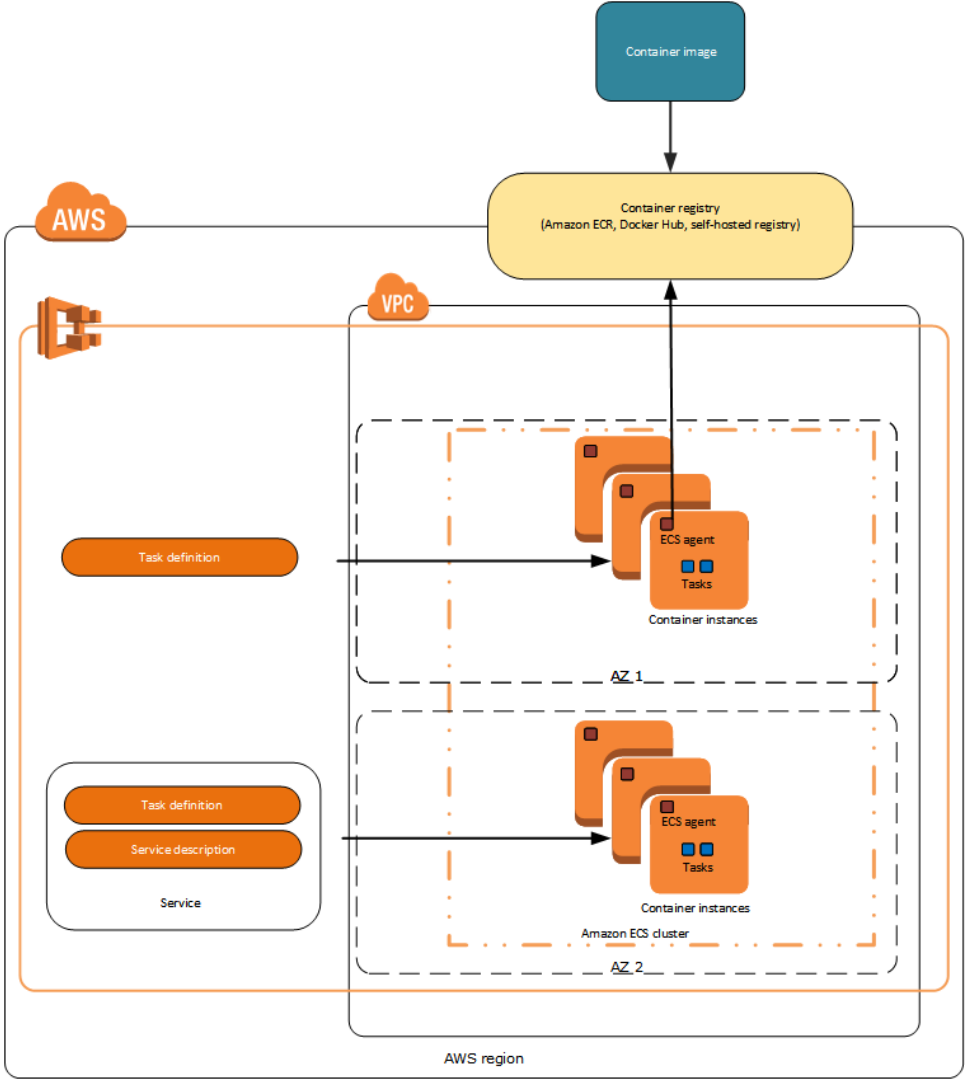
Extensible



- Comprehensive APIs
- Custom schedulers
- Open source agent and CLI

ECS Components

- ECS Cluster
- Container Agent
- Task Definitions
- Tasks and Scheduling
- Services and ECR



amazon web services

ECS Cluster

dockermeetup01 >

1
Services

4
Running tasks

0
Pending tasks

0.00%
CPUUtilization

0.05%
MemoryUtilization

4
Container instances

Status: ALL ACTIVE DRAINING

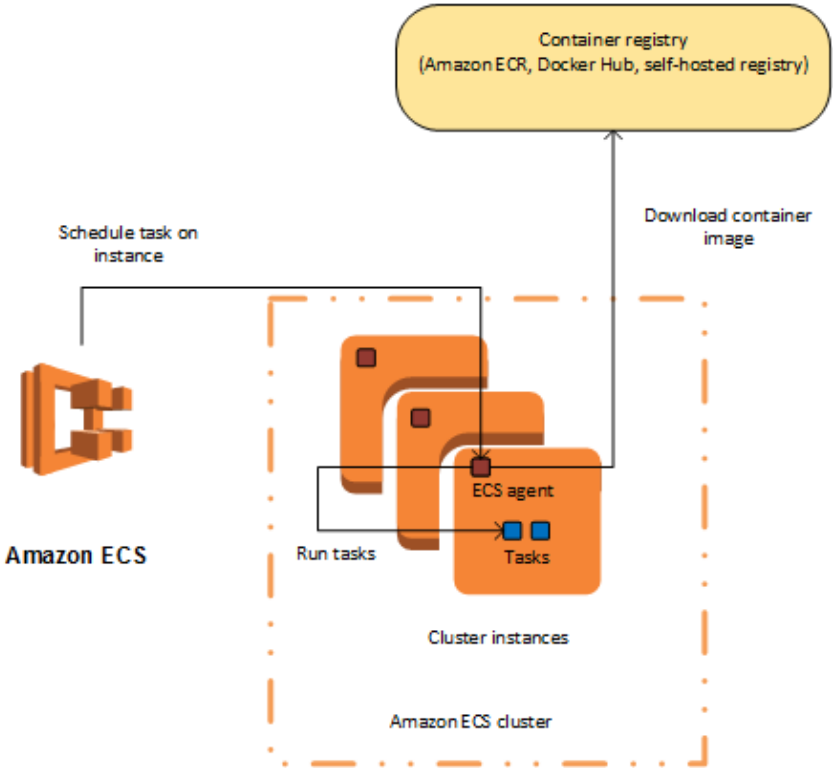
Filter in this page

1-4 Page size 50

Container Instance	EC2 Instance	Availa...	Agent...	Status	Runni...	CPU a...	Memo...	Agent...	Dock...
1a6fc99f-4497-4cf6-995e-...	i-0416dc054db...	us-eas...	true	ACTIVE	1	2048	3255	1.14.0	1.12.6
286a2368-9af0-4402-8eec...	i-0262a411578...	us-eas...	true	ACTIVE	1	2048	3255	1.14.0	1.12.6
cd4f50e1-169e-41df-a01f-...	i-0b11c96c42f5...	us-eas...	true	ACTIVE	1	2048	3255	1.14.0	1.12.6
e261ed44-587e-4177-8c5...	i-04a98a57c7b...	us-eas...	true	ACTIVE	1	2048	3255	1.14.0	1.12.6

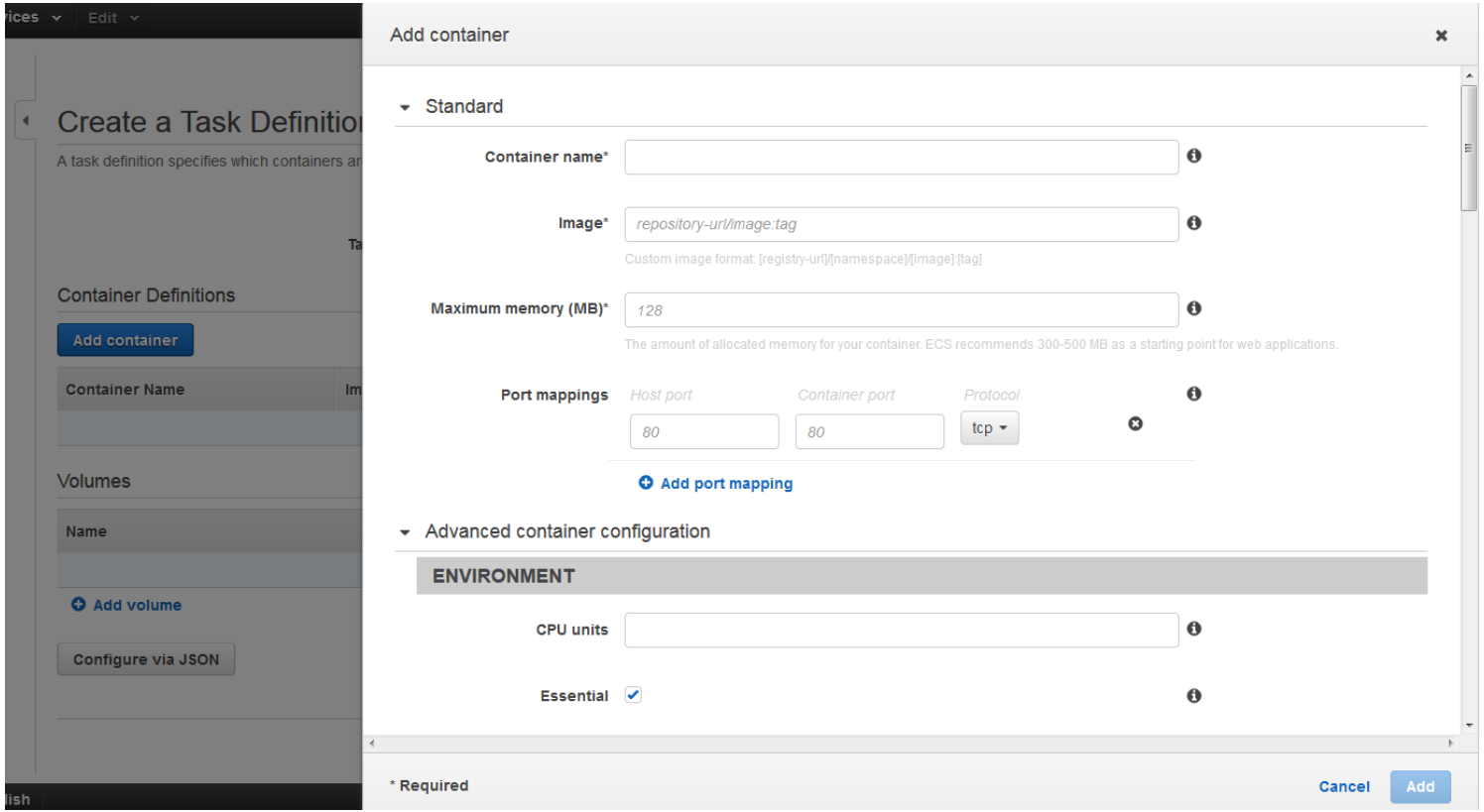
amazon web services

Container Agent

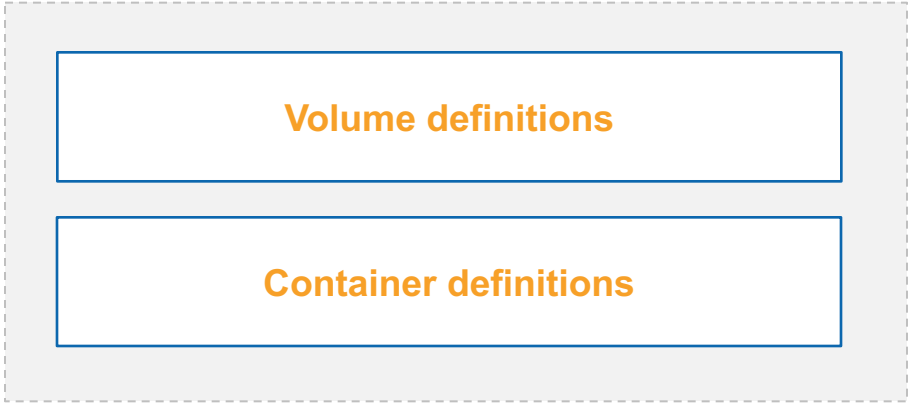


amazon web services

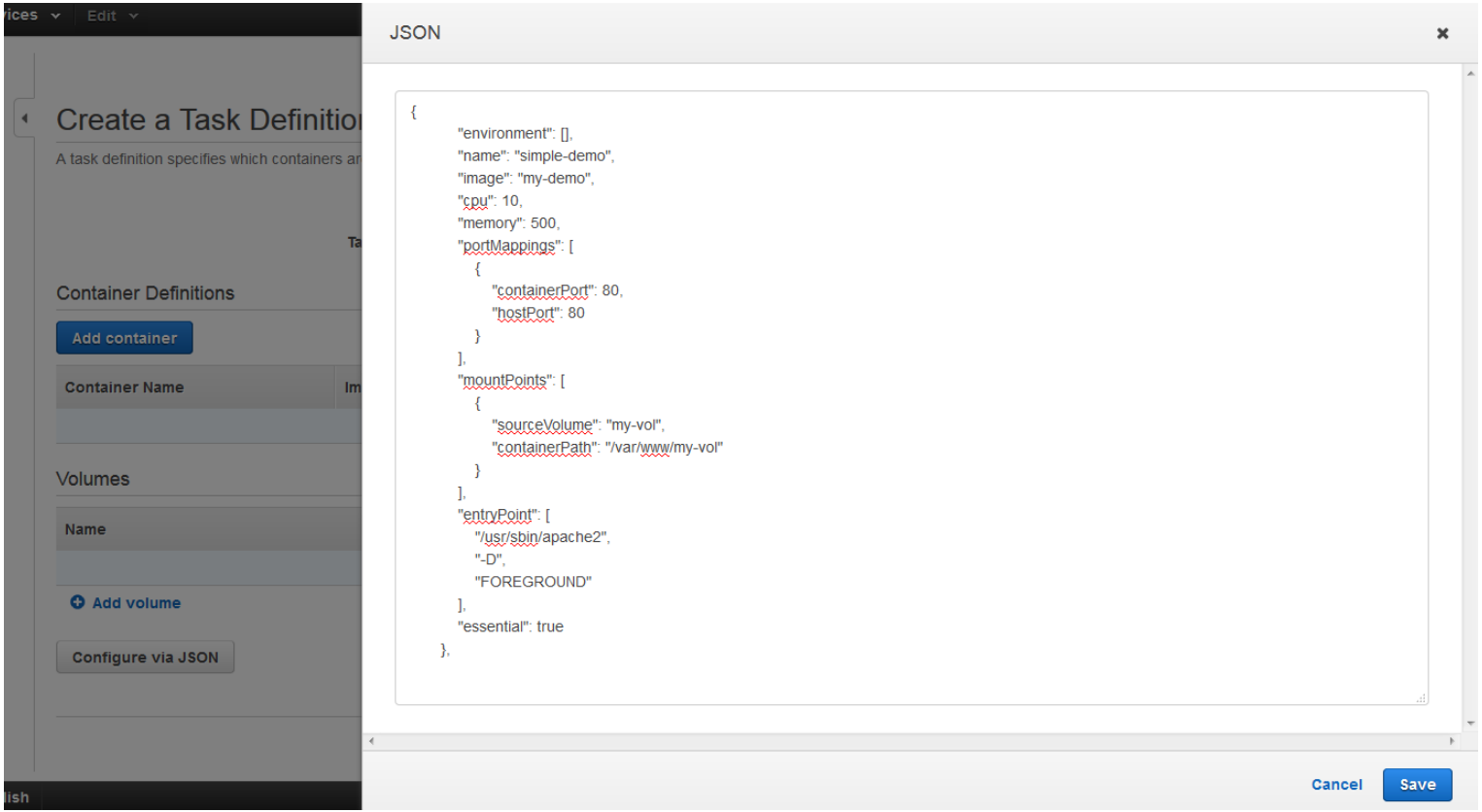
Key components: Task definitions



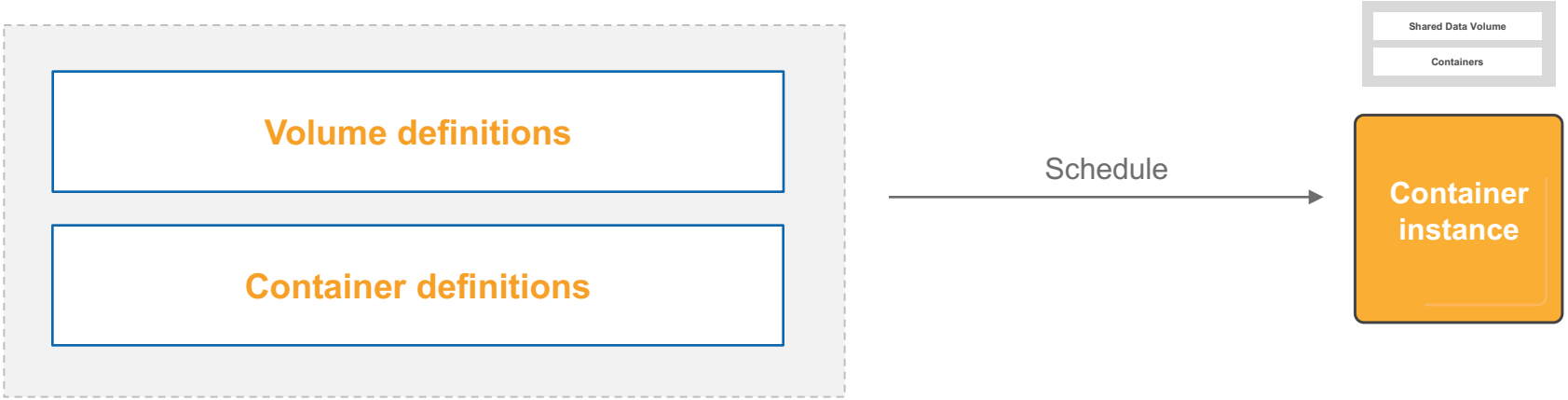
Task definitions



Key components: Task definitions



Tasks



Tasks

- Unit of work
- Grouping of related containers
- Run on container instances

Create service

Good for long-running applications and services

Create Service

A service lets you specify how many copies of your task definition to run. You could also that number of tasks running and coordinates task scheduling with the load balancer.

Task Definition console-sample-app-static:1

Cluster default

Service name my-service

Number of tasks 5

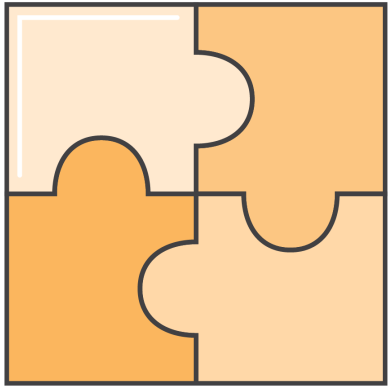
Elastic Load Balancing

You can optionally select Elastic Load Balancer to distribute incoming application traffic

Add

amazon web services

Integration ECS with AWS products

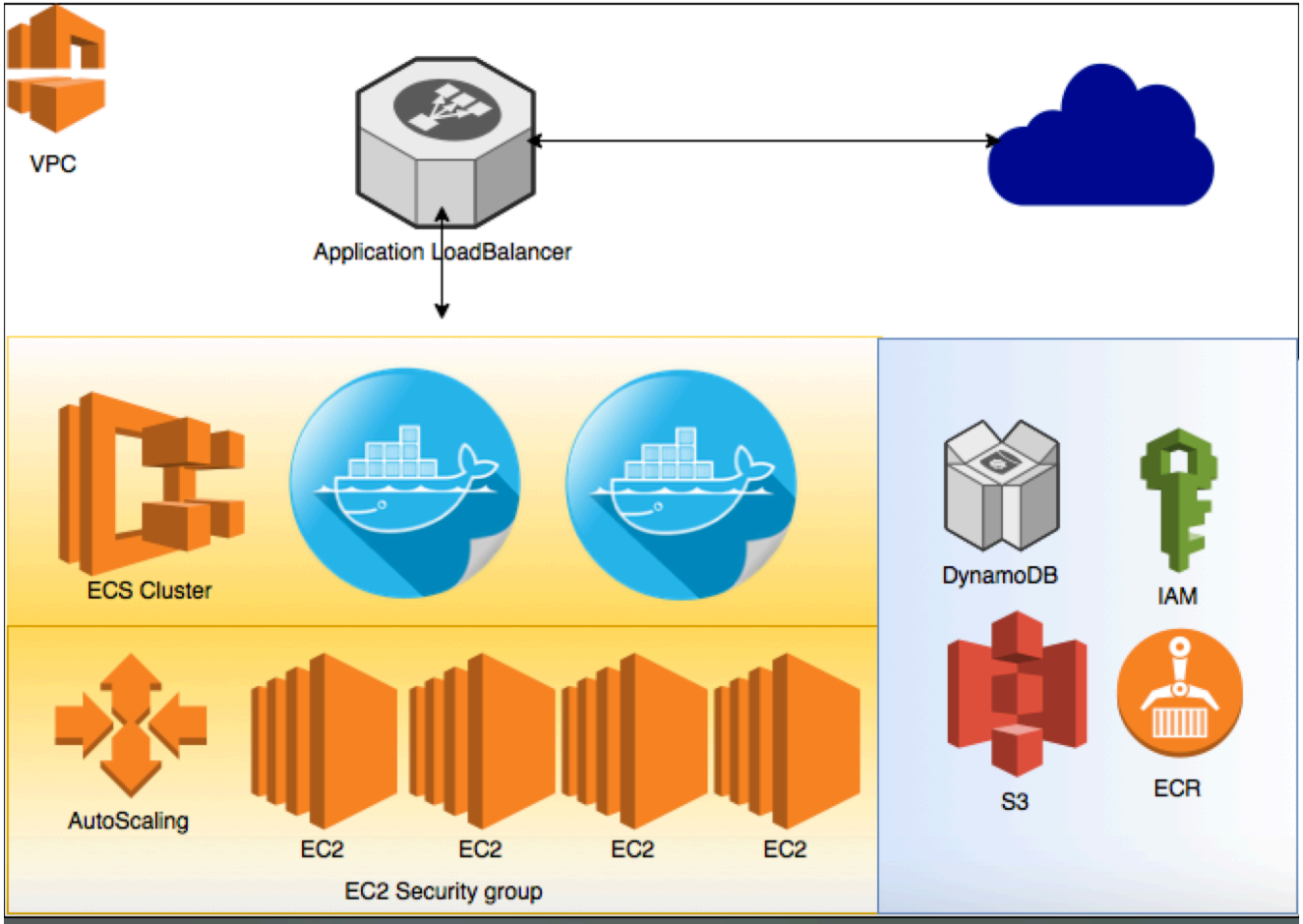


- Elastic Load Balancing
- AWS Identity and Access Management
- AWS CloudTrail
- Amazon CloudWatch
- EC2 Container Registry (ECR)
- AWS Cloud Formation
- AWS Code*
- Amazon Elastic Block Store
- Elastic File System
- Amazon Virtual Private Cloud

amazon web services

Demo

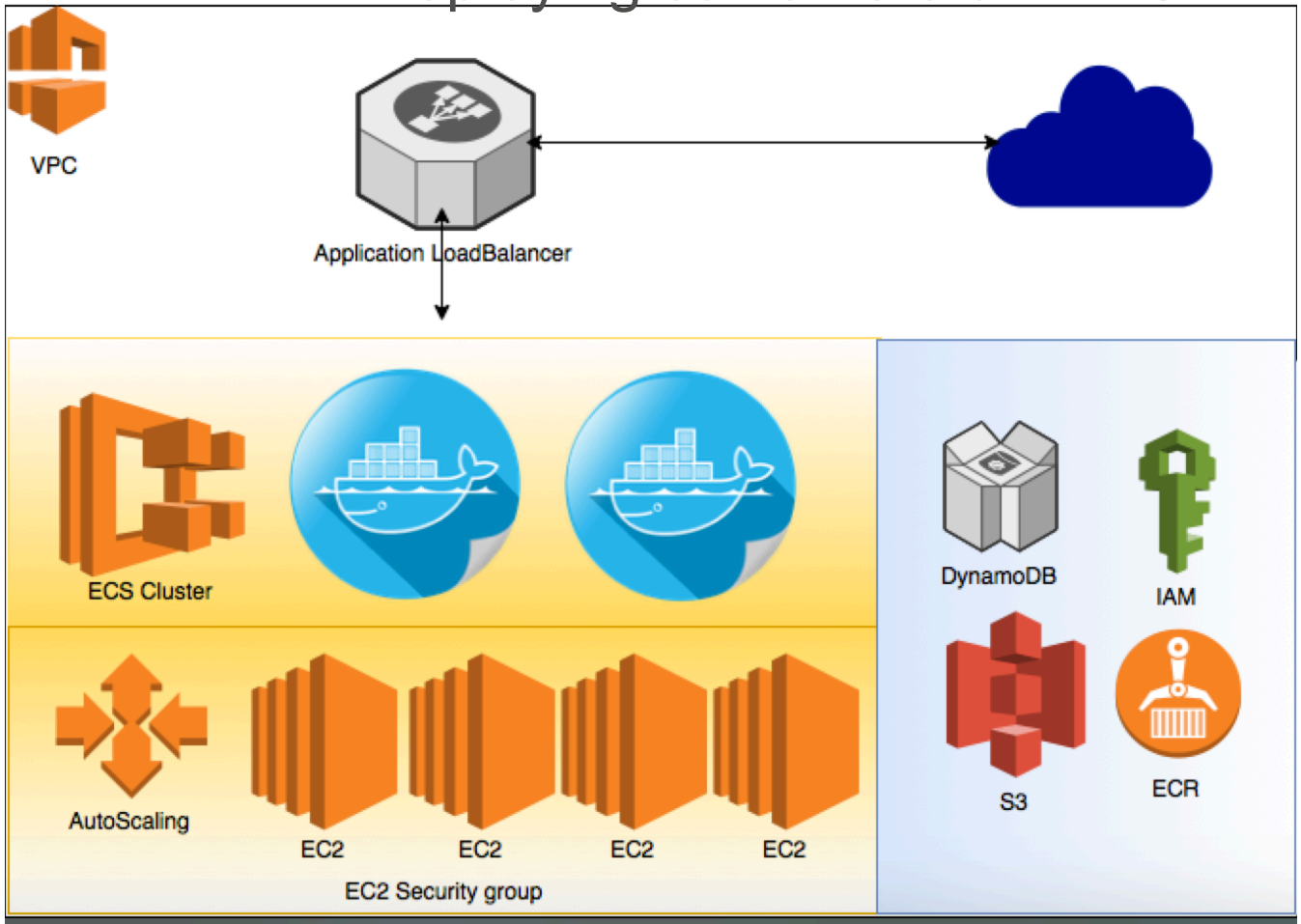
High Level Architecture

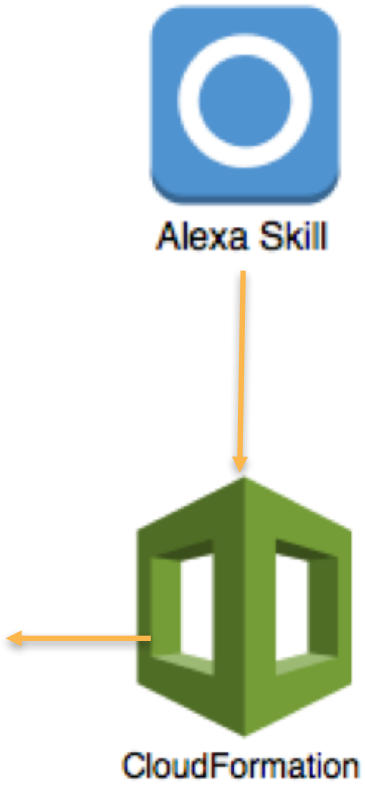


amazon web services

Amazon Alexa

Deploying containers on AWS

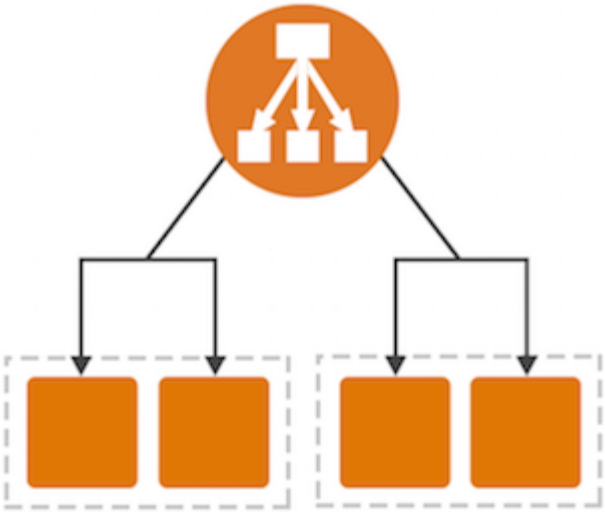




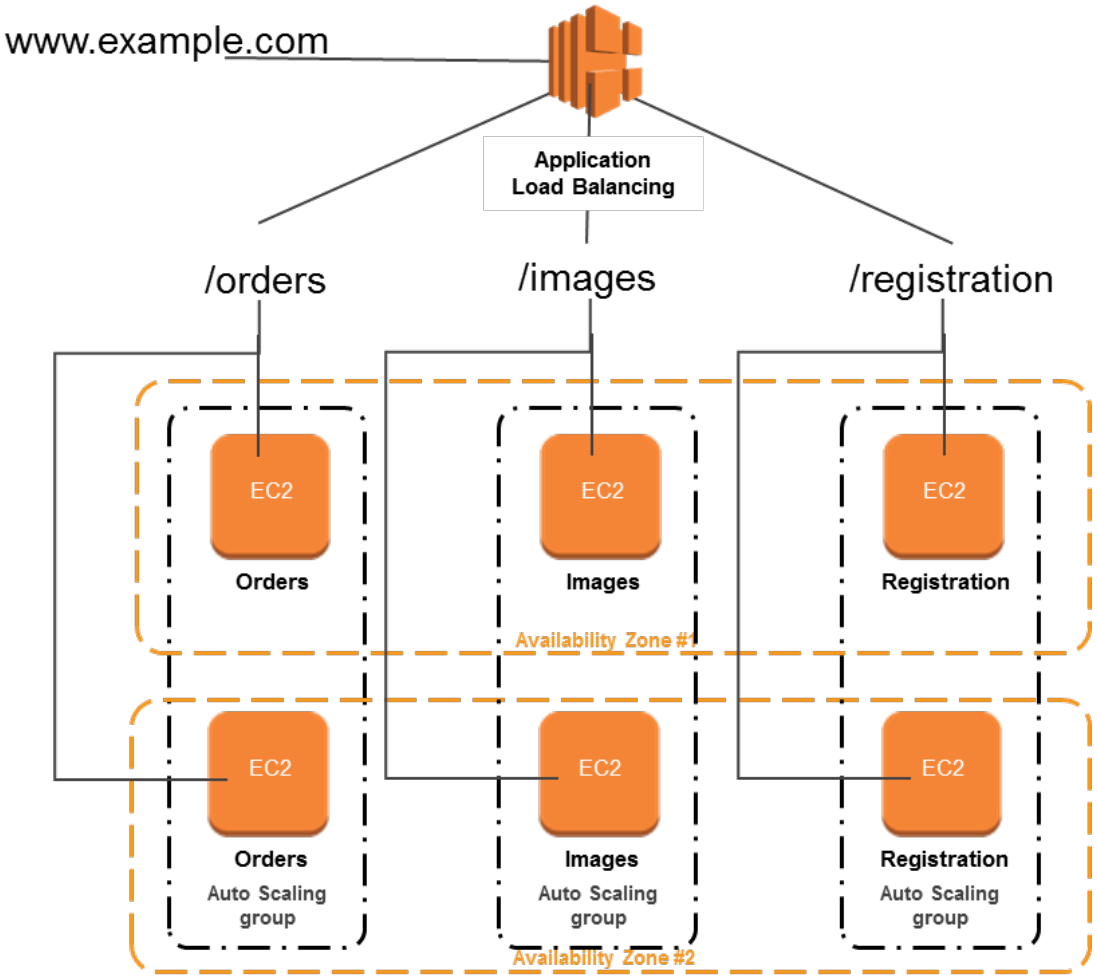
amazon web services

Application Load Balancer

- A Layer 7 load balancer
- HTTP/2 support
- WebSocket support
- IPv6 Support
- Support for Container-Based Applications
- Content-Based Routing

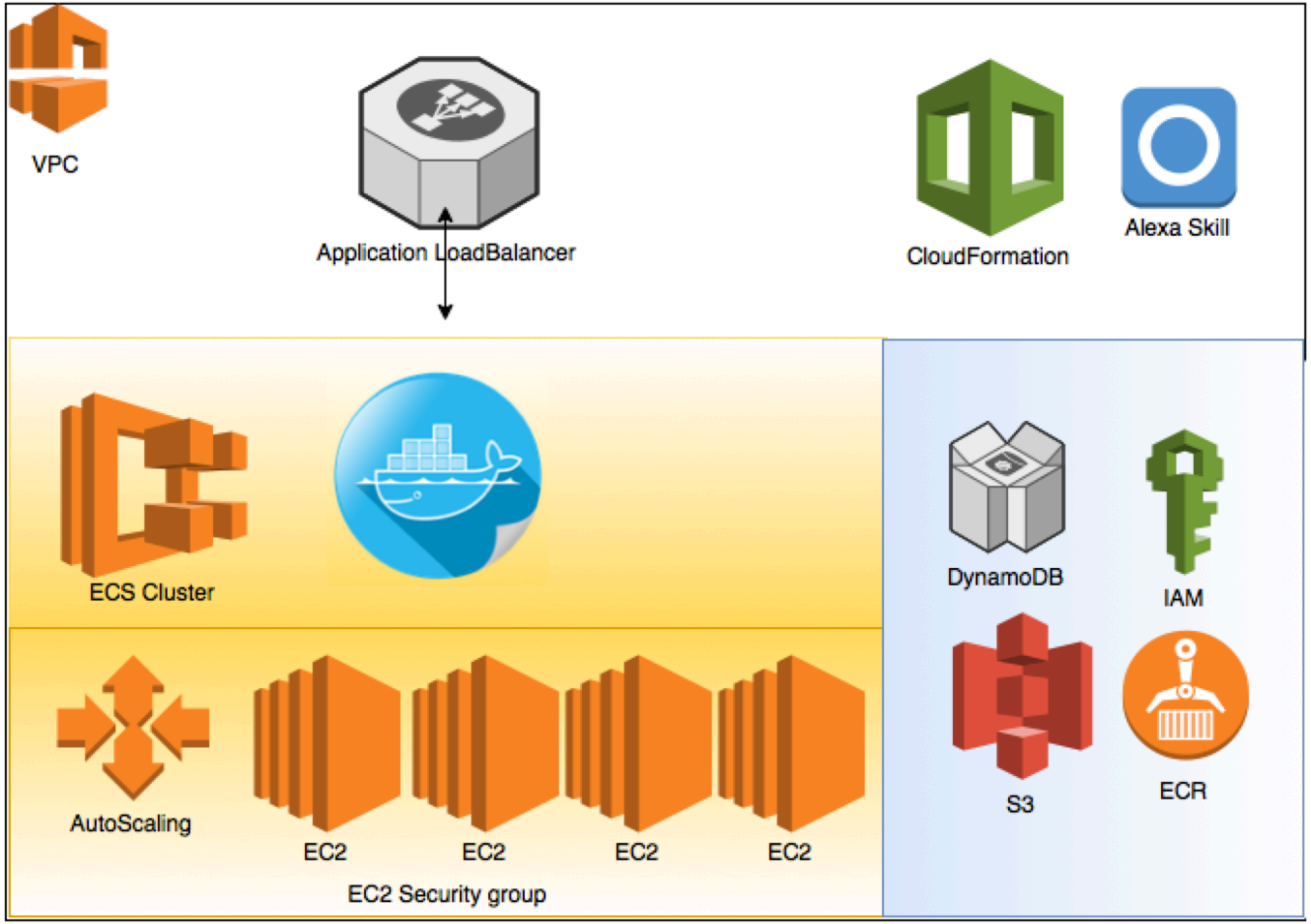


amazon web services



amazon
web services

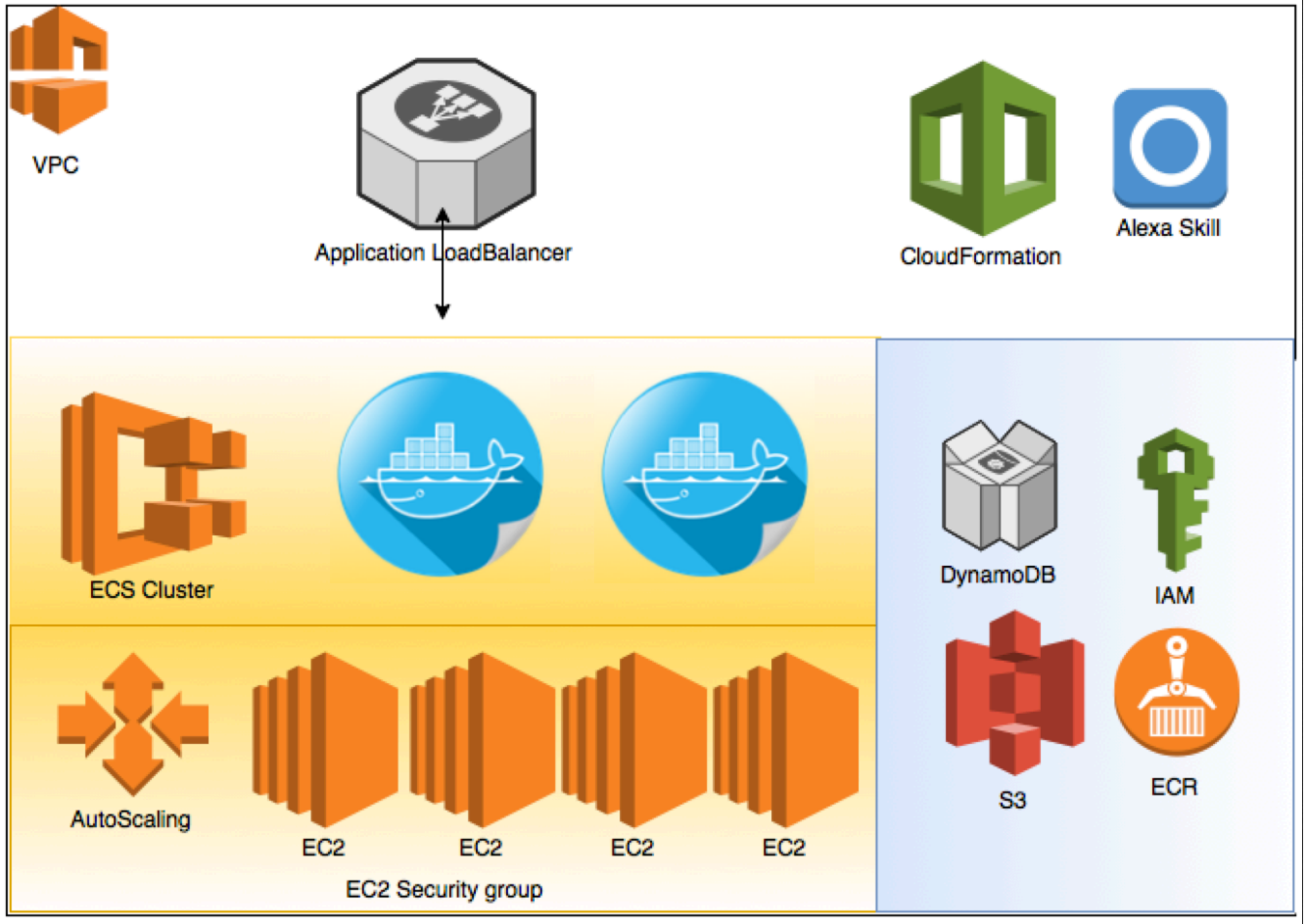
Building the base infrastructure for ECS



Alexa tell demo to deploy the game

amazon web services

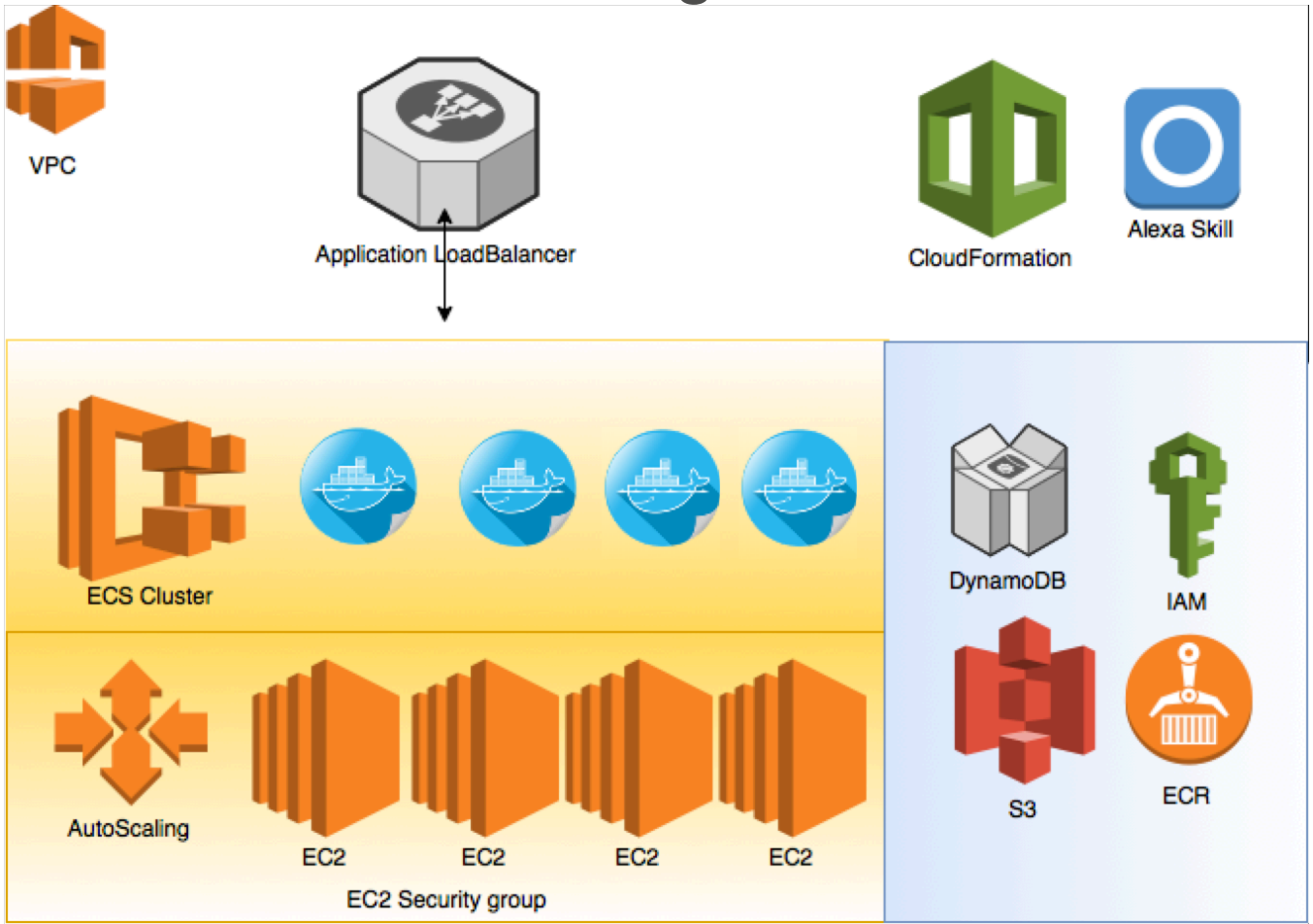
Updating the Task Definition to add a container



Alexa tell demo deploy score submit container

amazon web services

Creating new Task definitions

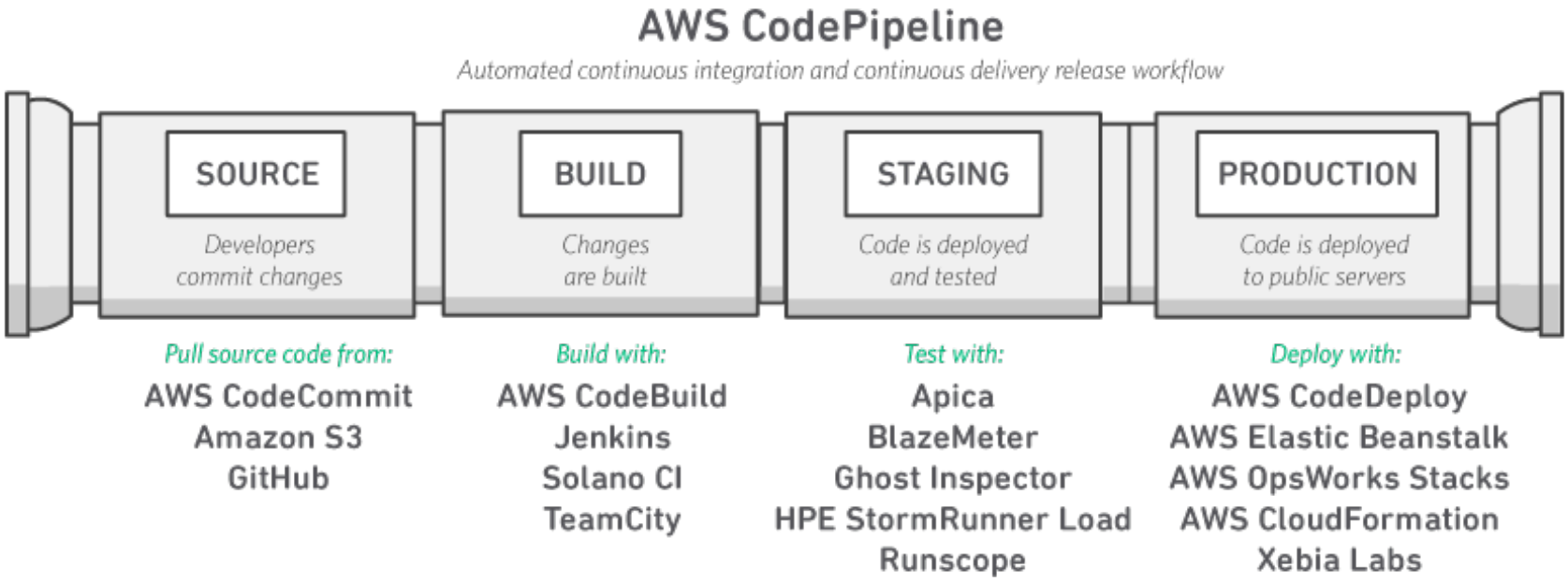


Alexa tell demo to deploy high scores page

Alexa tell demo to deploy info page

amazon web services

Continuous Integration in AWS



amazon web services

ECS Best Practices

- CloudWatch logs integration
- Check ECS service Limits
- ECS log collector
- Cloud Trails logs and notification
- Autoscaling for scaling your cluster
- Integration with the Code* series
- ECS credential helper

amazon web services

WE ARE HIRING!!

- DevOps Engineers
- Software Developers
- Linux specialists
- Systems Engineers

amazon web services

Thank you!

https://aws.nkh.io/info

https://github.com/SydneyDockerMeetupAWS

amazon web services

Resources:

- Docker and AWS: https://aws.amazon.com/docker/
- AWS Batch: https://aws.amazon.com/batch/use-cases/
- ECS First Run: https://aws.amazon.com/getting-started/tutorials/deploy-docker-containers/
- Scaling ECS: https://www.youtube.com/watch?v=eun8CqGqdk8
- AWS Sydney Summit: https://aws.amazon.com/summits/sydney/agenda/

amazon web services