AWS Introduction

Building / Deploying Applications in the Cloud

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About us...

Agenda

12:15 - 13:00h Theorie Teil 1

- AWS Einführung
- AWS Global Infrastructure
- AWS Service Portfolio
- Example Architecture: Grails App on AWS

Pause 13:00 - 13:10h

13:10 - 14:10h Hands-On Lab

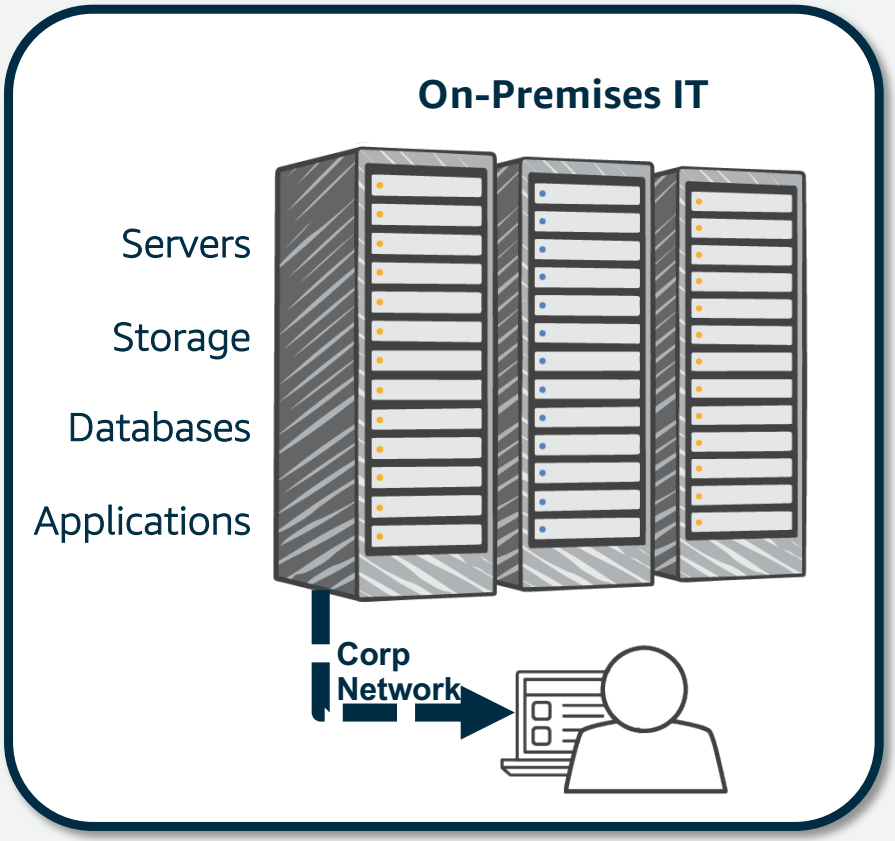
Pause 14:10 - 14:20h

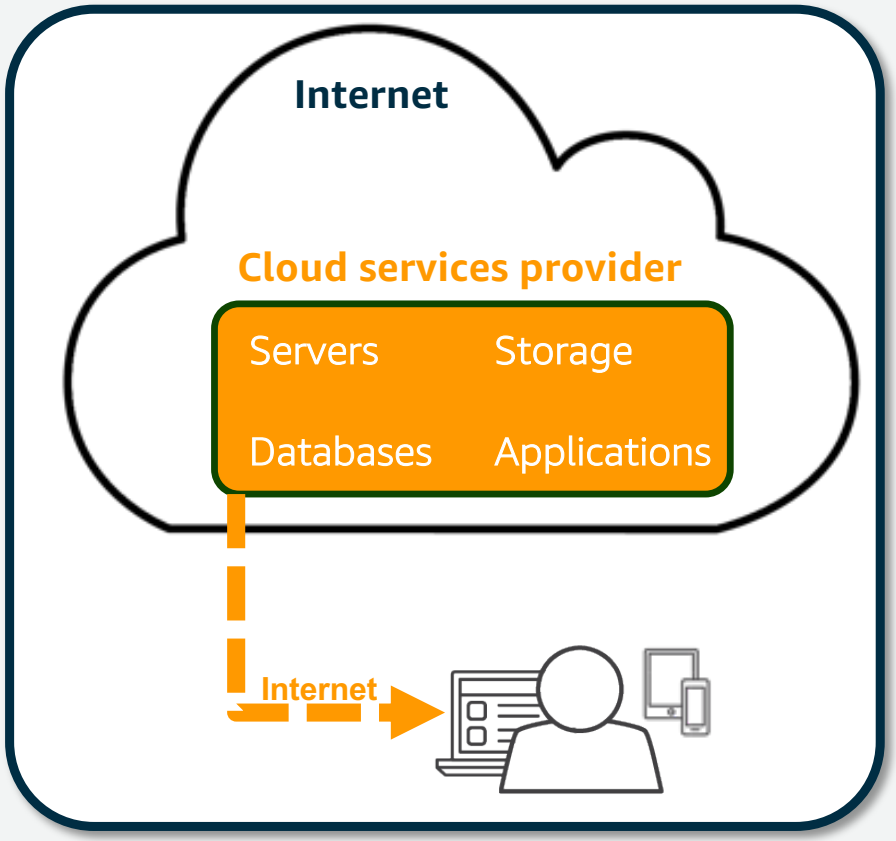
14:20 - 15:00h Theorie Teil 2

- Automation
- Development Tools

In 1994 Amazon Started with Books…

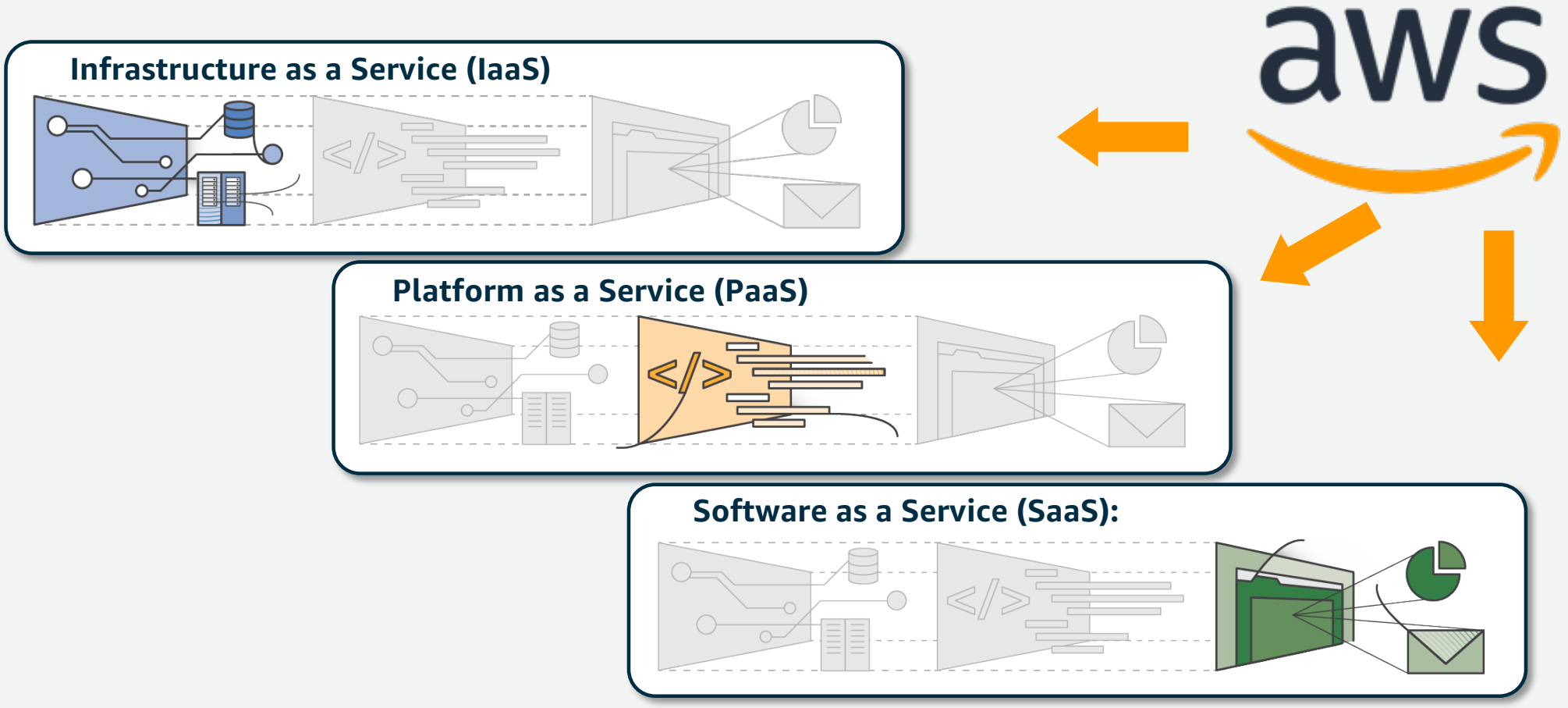
What is Cloud Computing?





aws

Cloud Computing Models



AWS Global Infrastructure

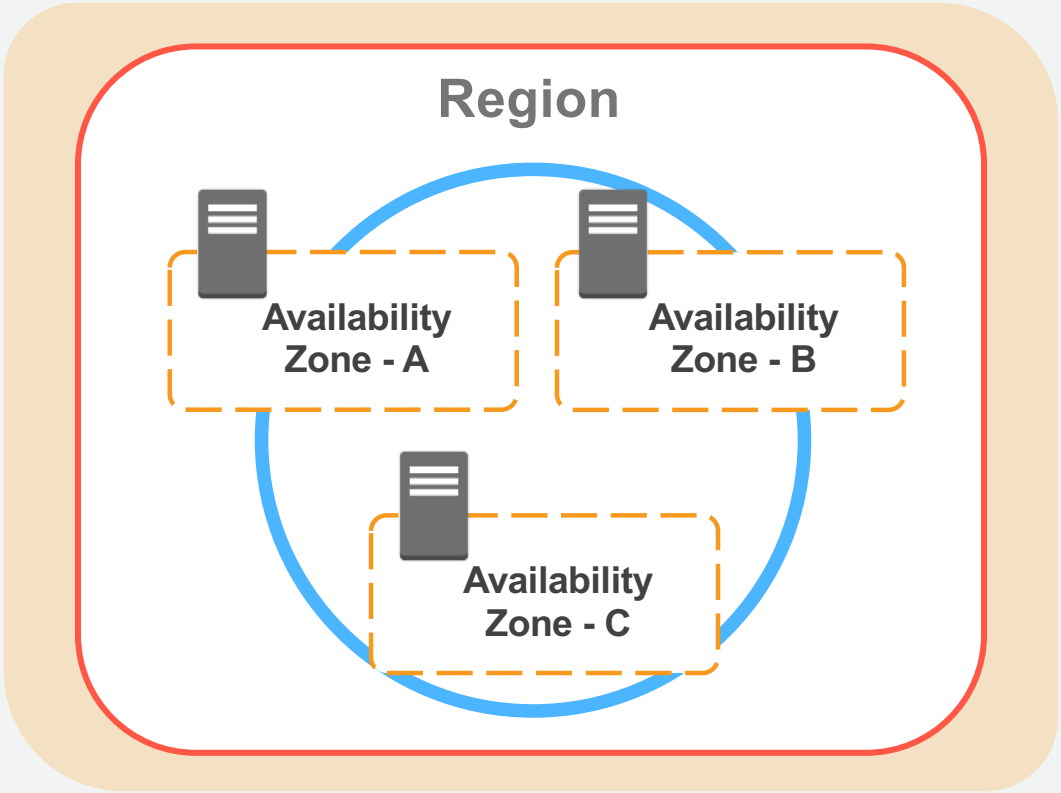
21 regions, 66 availability zones, 169 points of presence

Regions

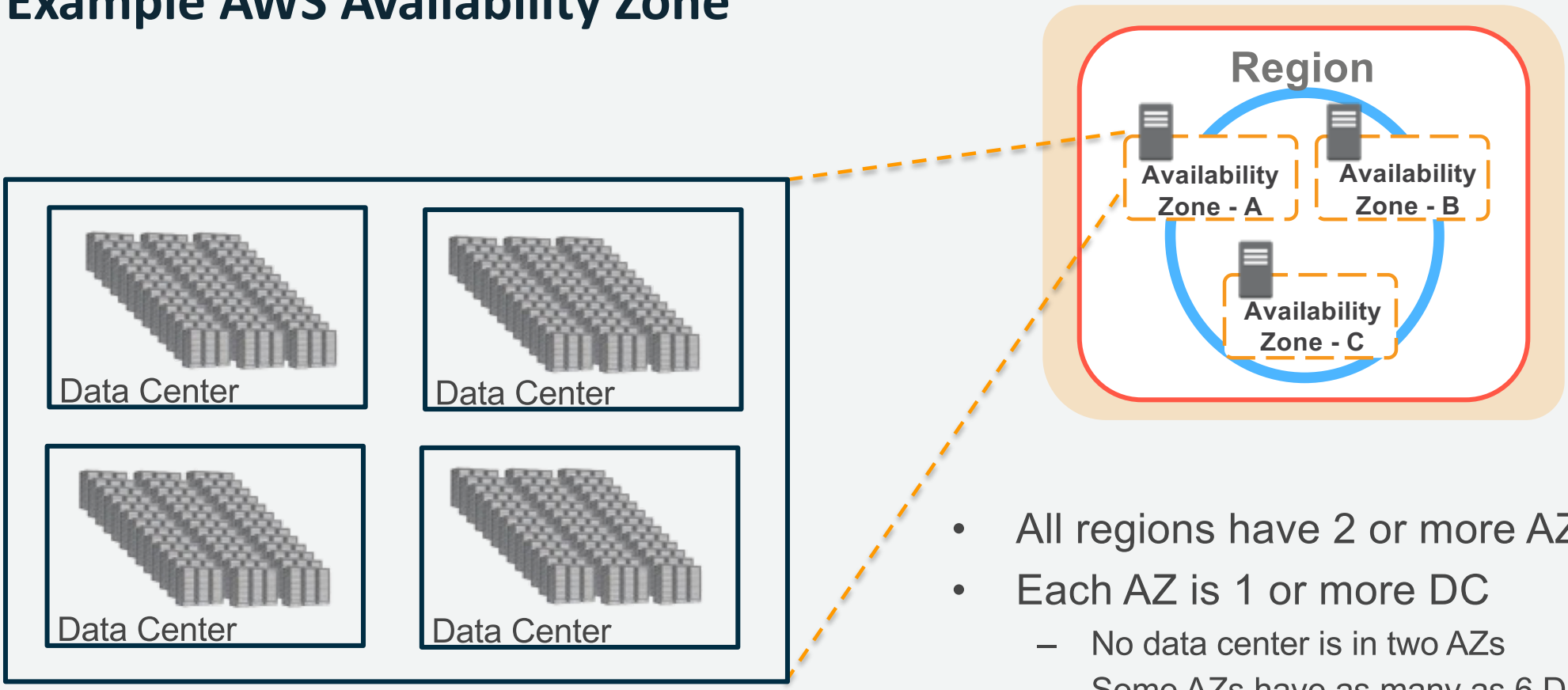
Coming Soon Bahrain, Indonesia, Italy, South Africa

https://aws.amazon.com/about-aws/global-infrastructure/

Ensuring High Availability



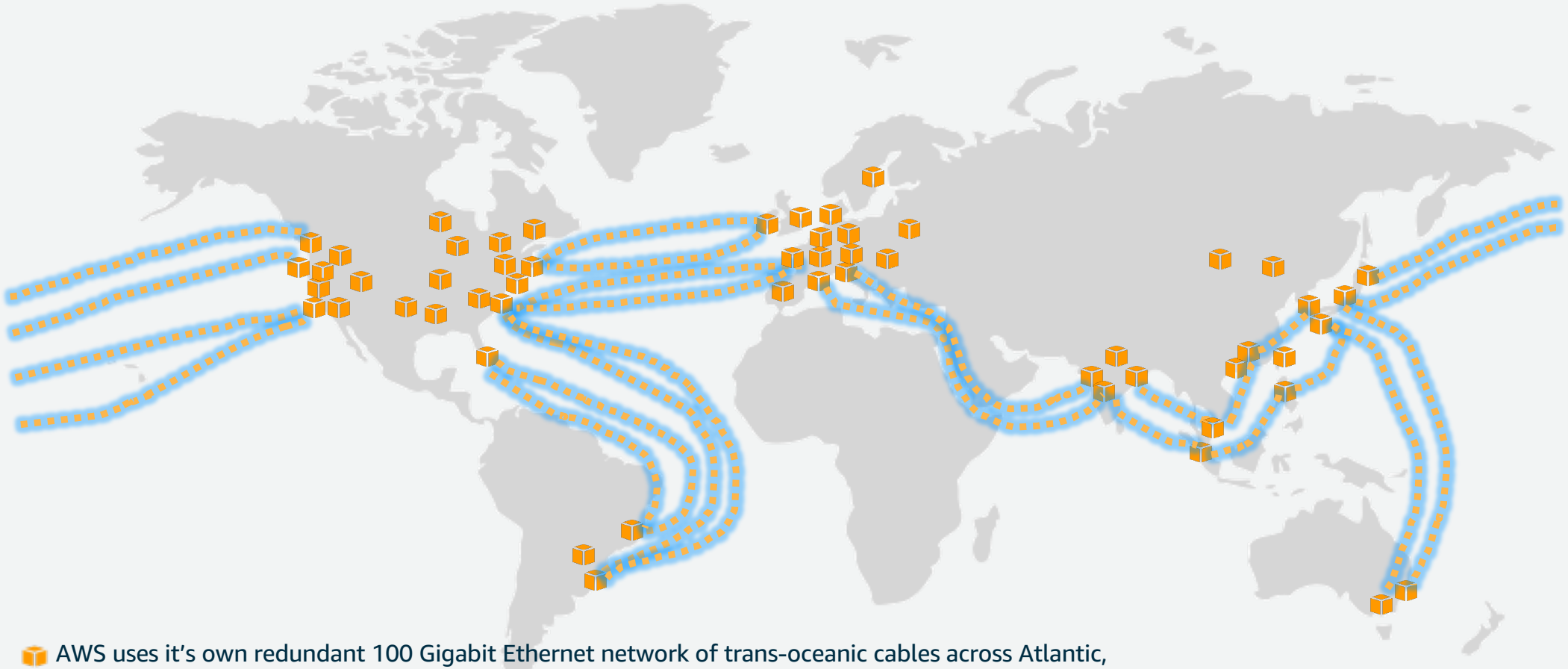
Example AWS Availability Zone



- All regions have 2 or more AZs
- Each AZ is 1 or more DC
  - No data center is in two AZs
  - Some AZs have as many as 6 DCs
- DCs in AZ less than 0.25 ms apart

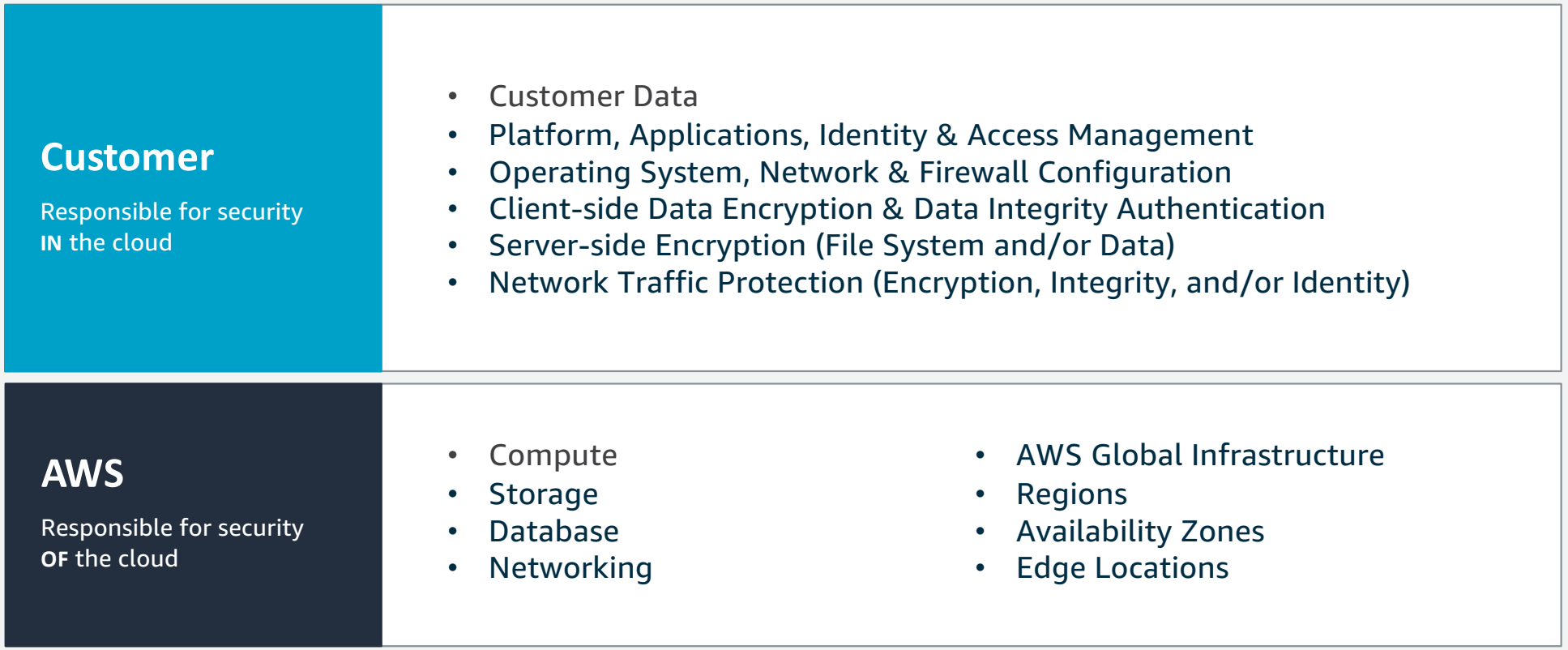
https://www.youtube.com/watch?v=uj7Ting6Ckk&t=6s

The AWS Network



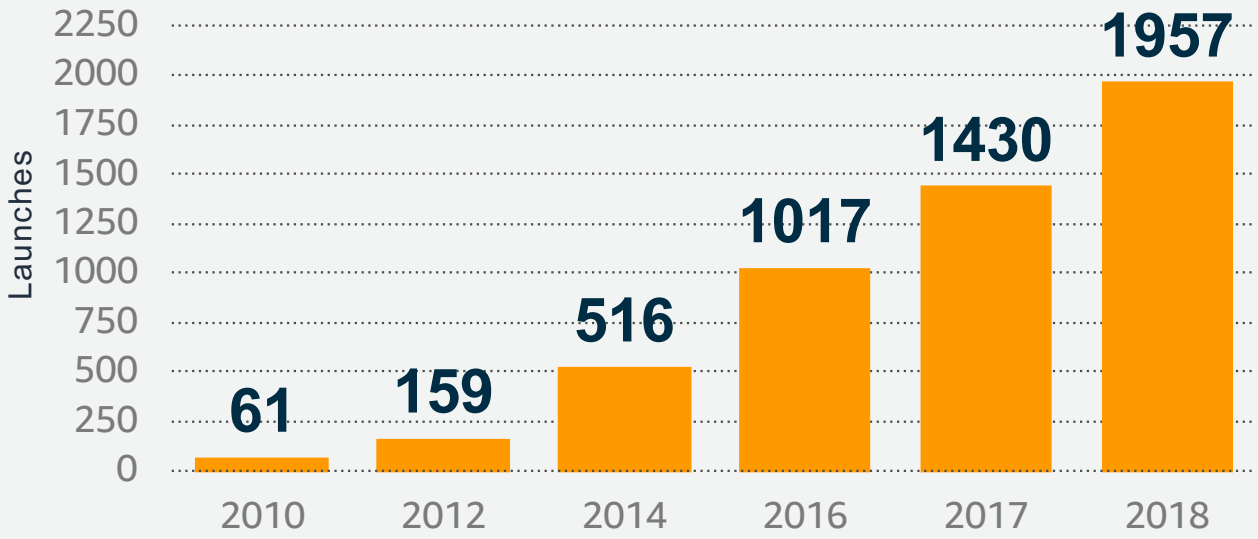
- AWS uses it's own redundant 100 Gigabit Ethernet network of trans-oceanic cables across Atlantic, Pacific and Indian Oceans and the Mediterranean, Red and South China Seas.

Shared Responsibility Model

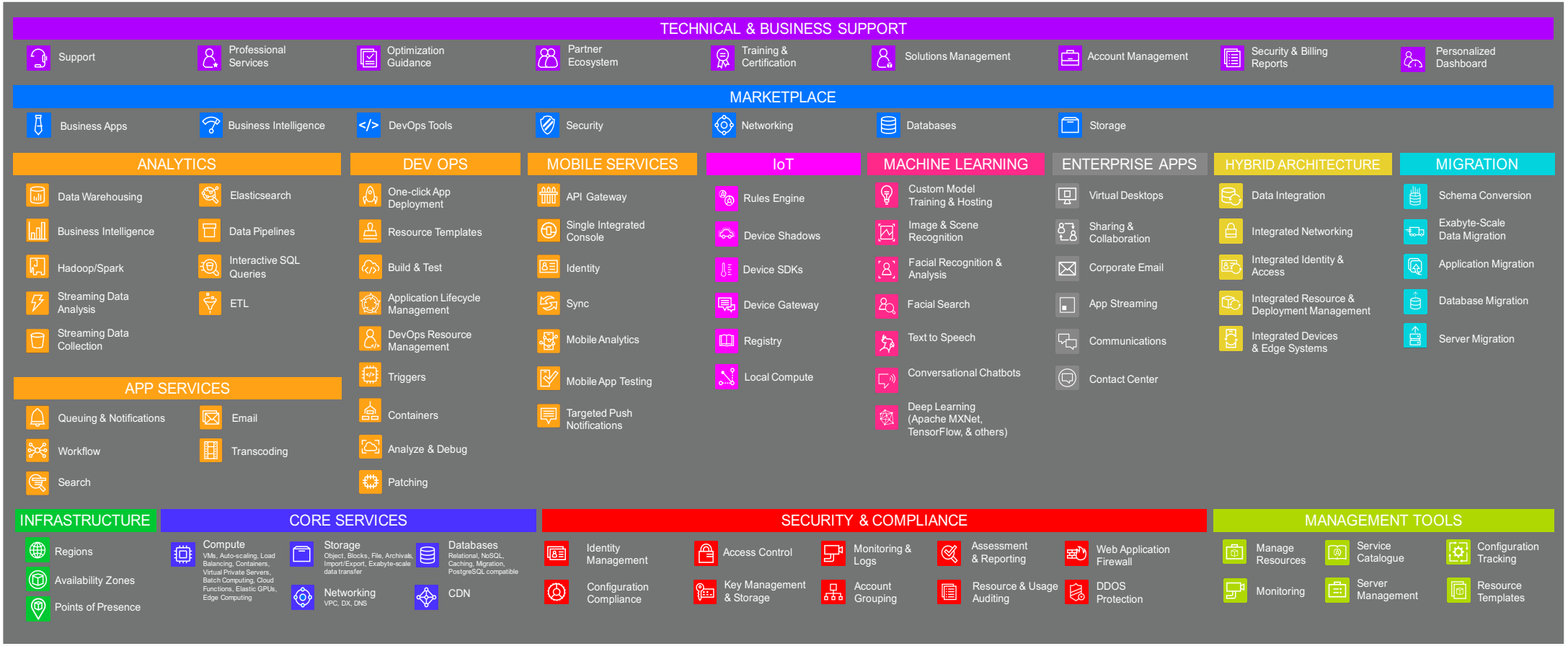


AWS Pace of Innovation

AWS has been continually expanding its services to support virtually any cloud workload, and it now has more than 90 services that range from compute, storage, networking, database, analytics, application services, deployment, management, developer, mobile, Internet of Things (IoT), Artificial Intelligence (AI), security, hybrid and enterprise applications.

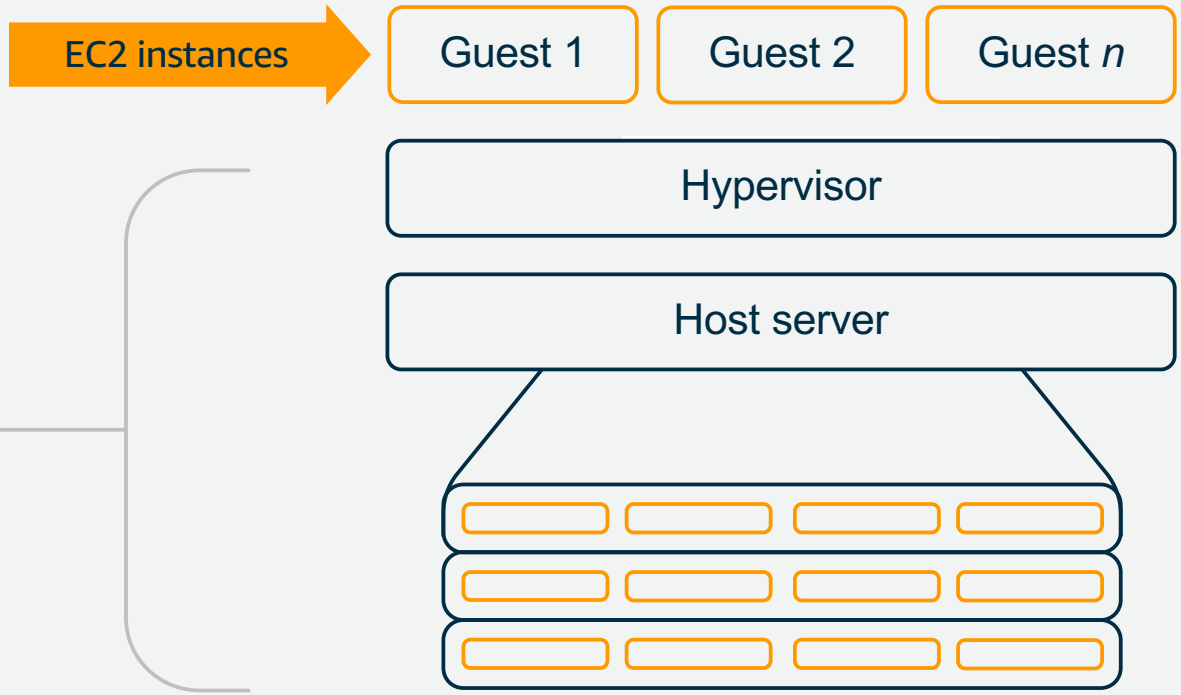


The AWS Platform



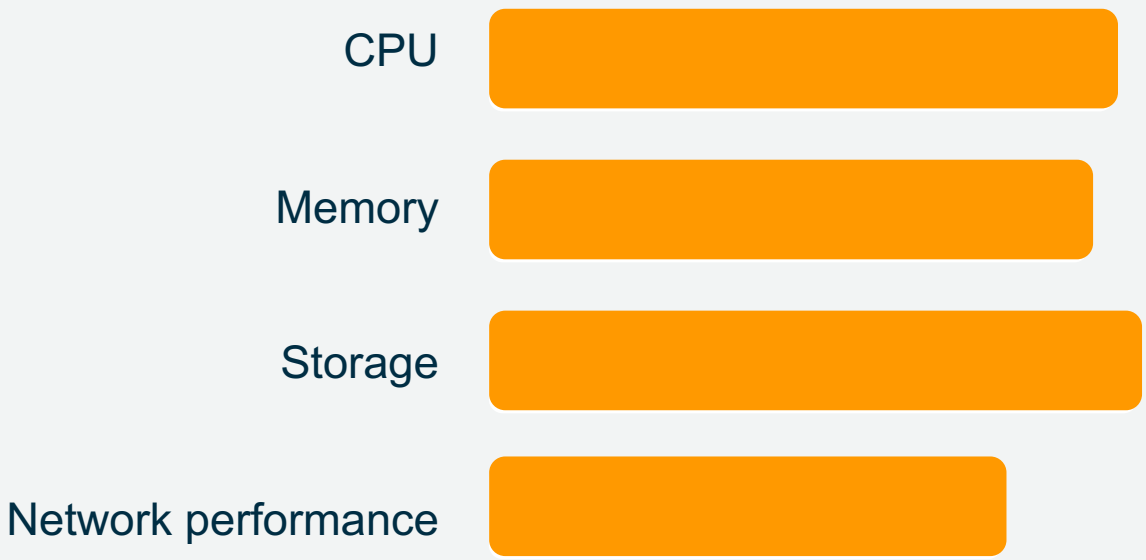
Amazon Elastic Compute Cloud (EC2)

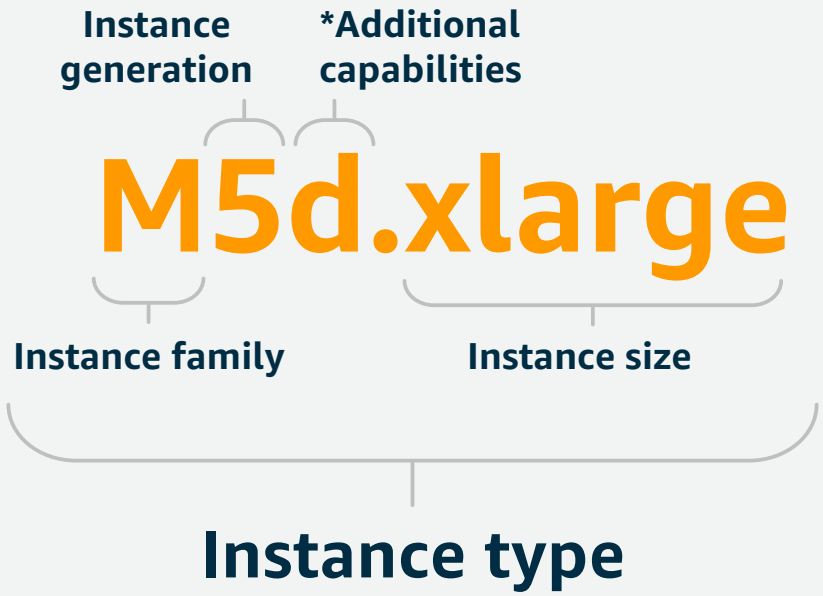
Virtual servers in the cloud



Physical servers in
AWS global regions

Amazon EC2 instance characteristics





https://aws.amazon.com/ec2/instance-types/

Broadest and deepest platform choice

Categories

General purpose

Burstable

Compute intensive

Memory intensive

Storage (High I/O)

Dense storage

GPU compute

Graphics intensive

+

Capabilities

NEW Choice of processor
(AWS, Intel, AMD)

Fast processors
(up to 4.0 GHz)

High memory footprint
(up to 12 TiB)

Instance storage
(HDD and NVMe)

Accelerated computing
(GPUs and FPGA)

NEW Networking
(up to 100 Gbps)

Bare Metal

Size
(Nano to 32xlarge)

+

Options

Amazon Elastic Block Store

Elastic Graphics

NEW Elastic Inference

=

175

instance types for virtually every workload and business need

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Amazon Machine Images (AMIs)

Amazon maintained

Broad set of Linux and Windows images

Kept up-to-date by Amazon in each region

Amazon Linux 2 with five years of long term support, use on-premise

Marketplace maintained

Managed and maintained by AWS Marketplace partners

Your machine images

AMIs you have created from Amazon EC2 instances

Can keep private, share with other accounts, or publish to the community

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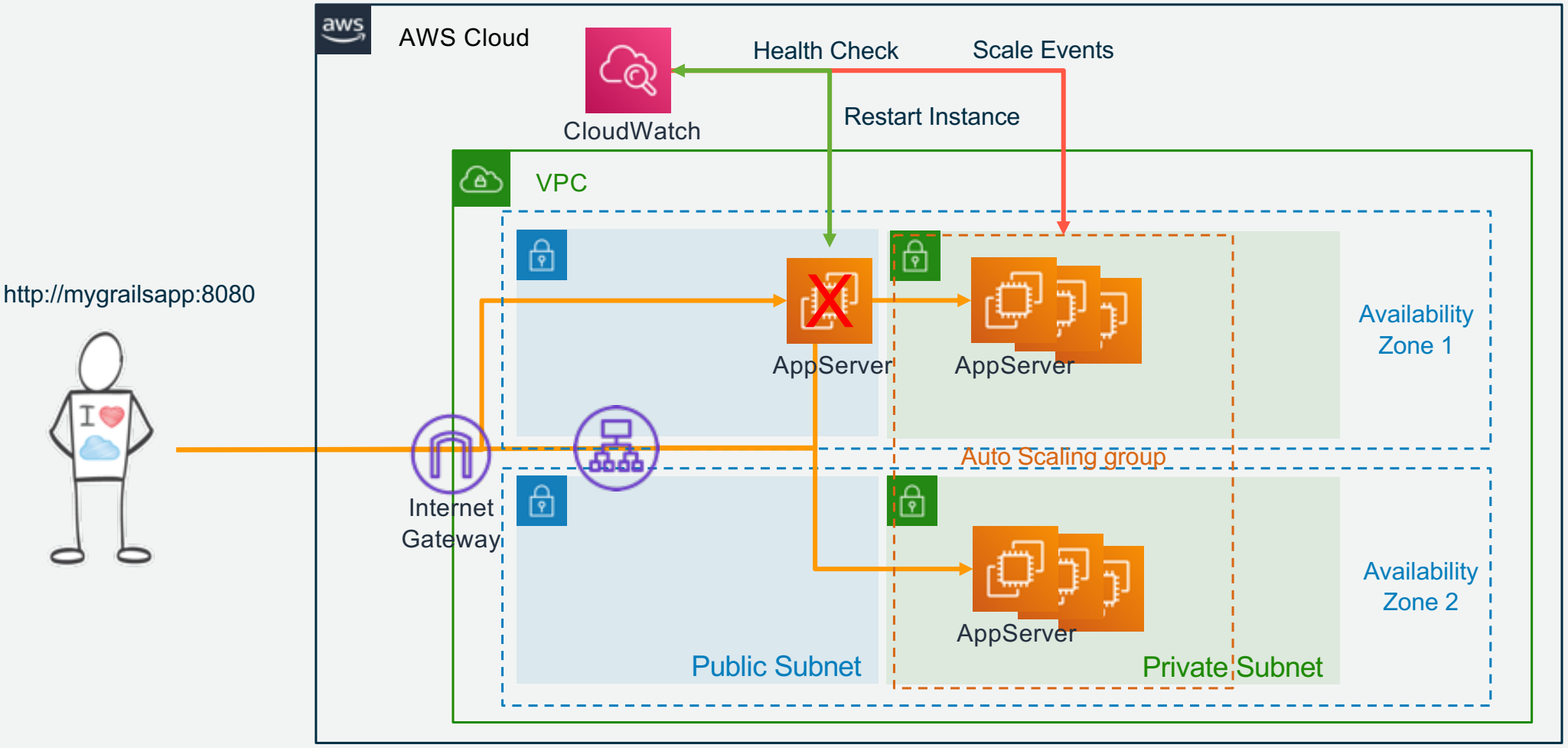
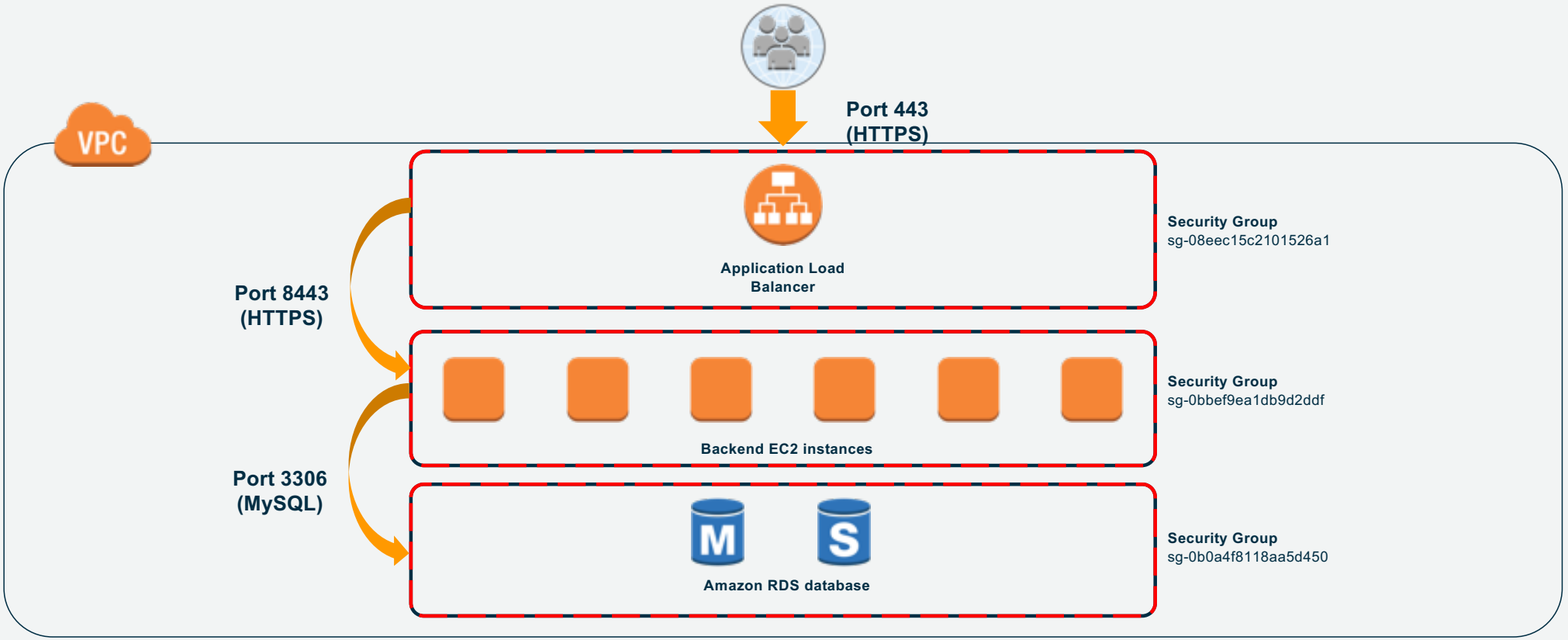
Grails App on AWS



Security Groups: Stateful network firewalls



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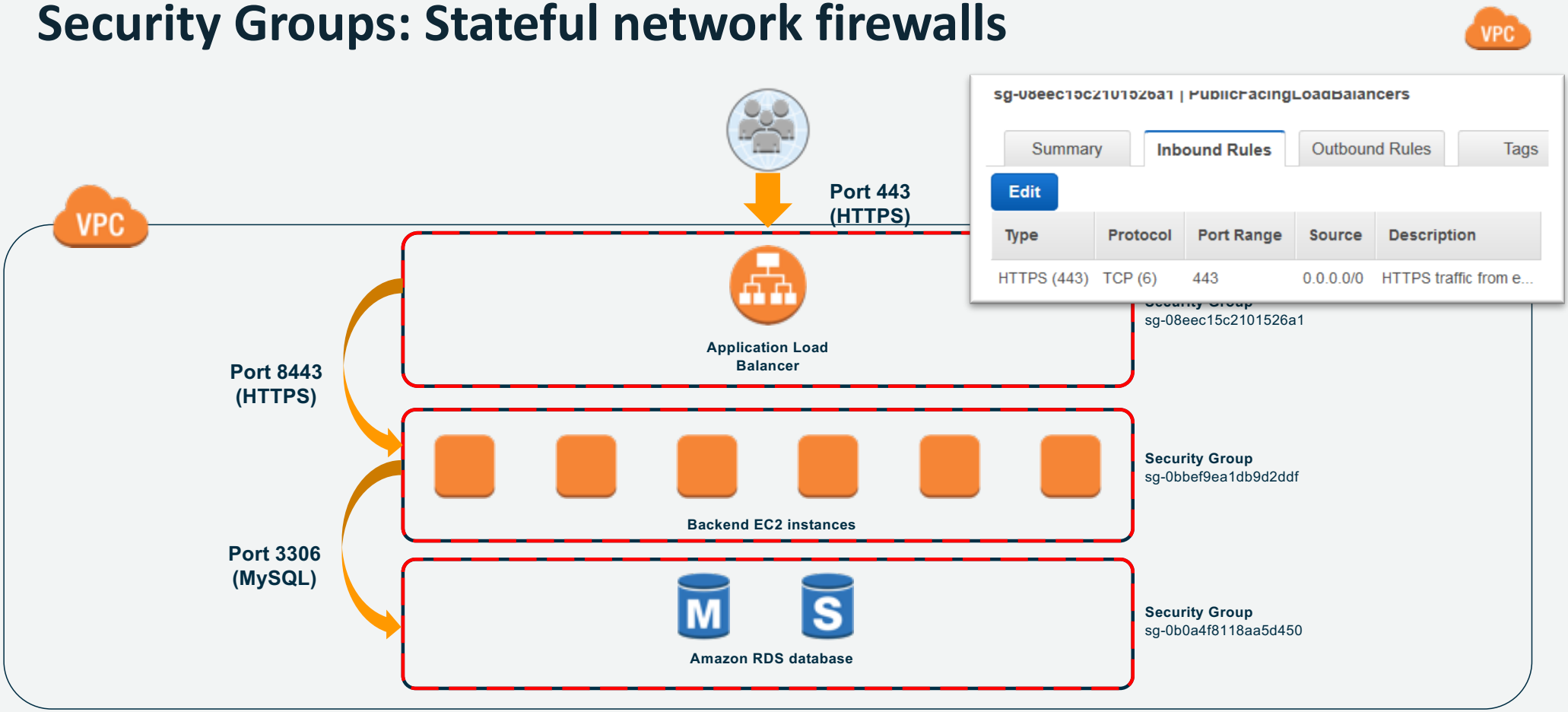

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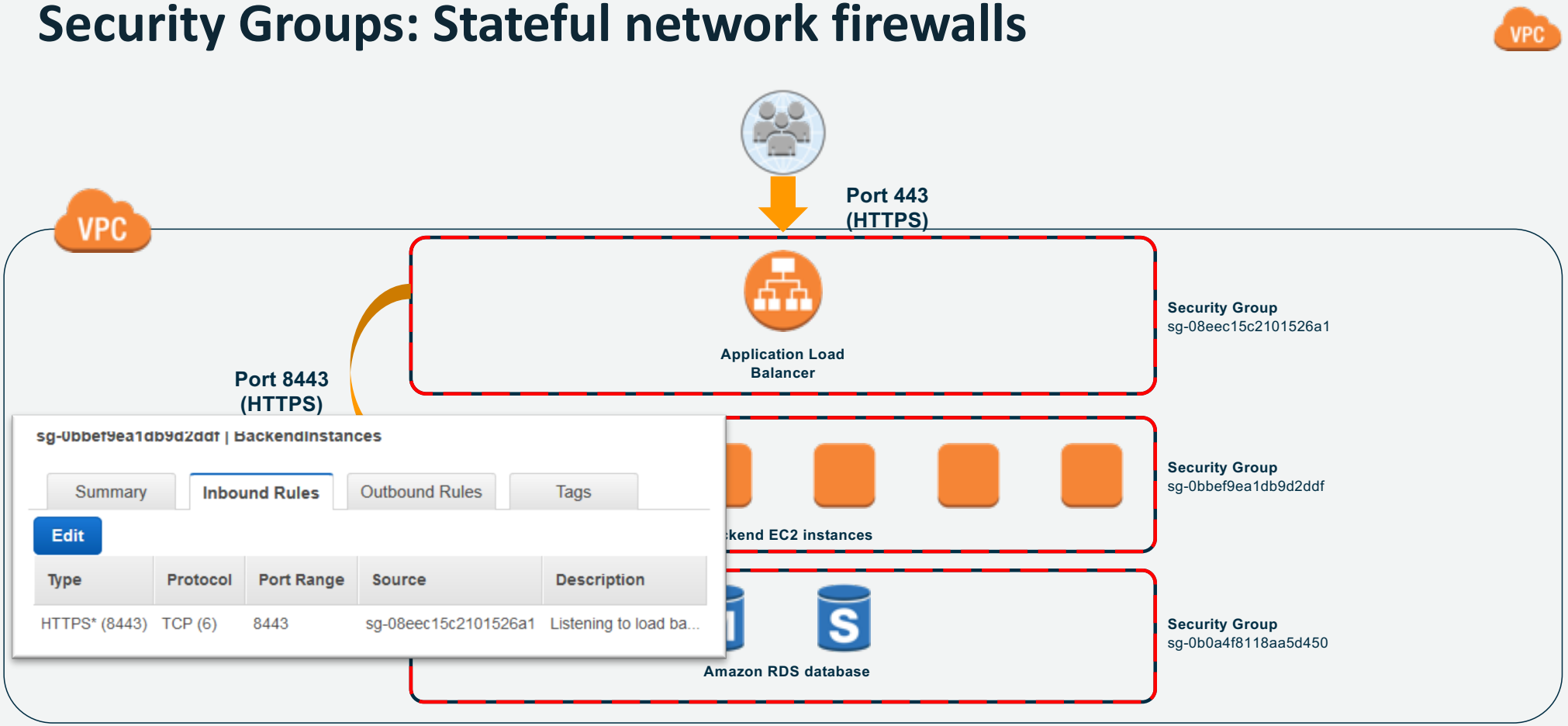

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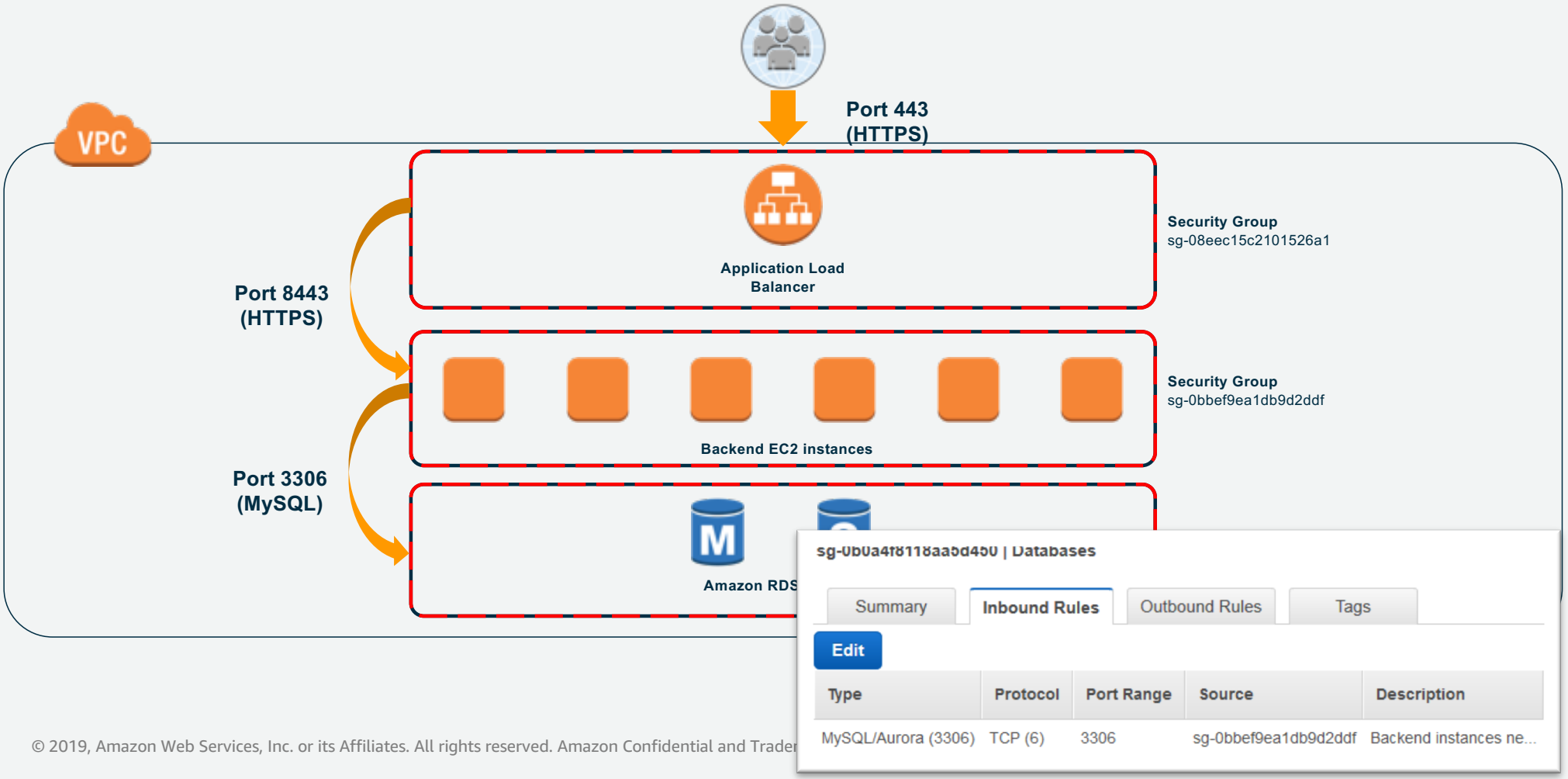
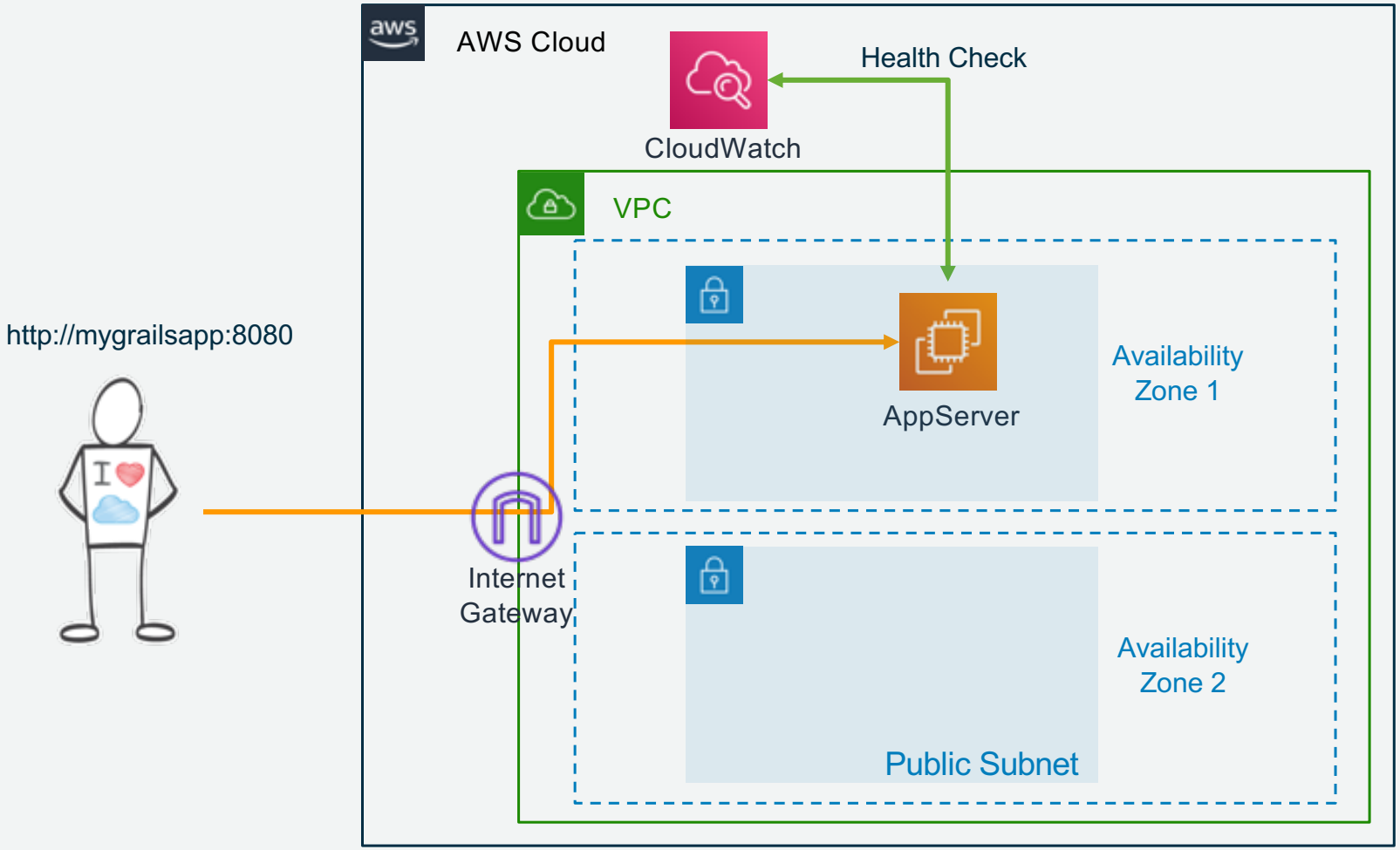
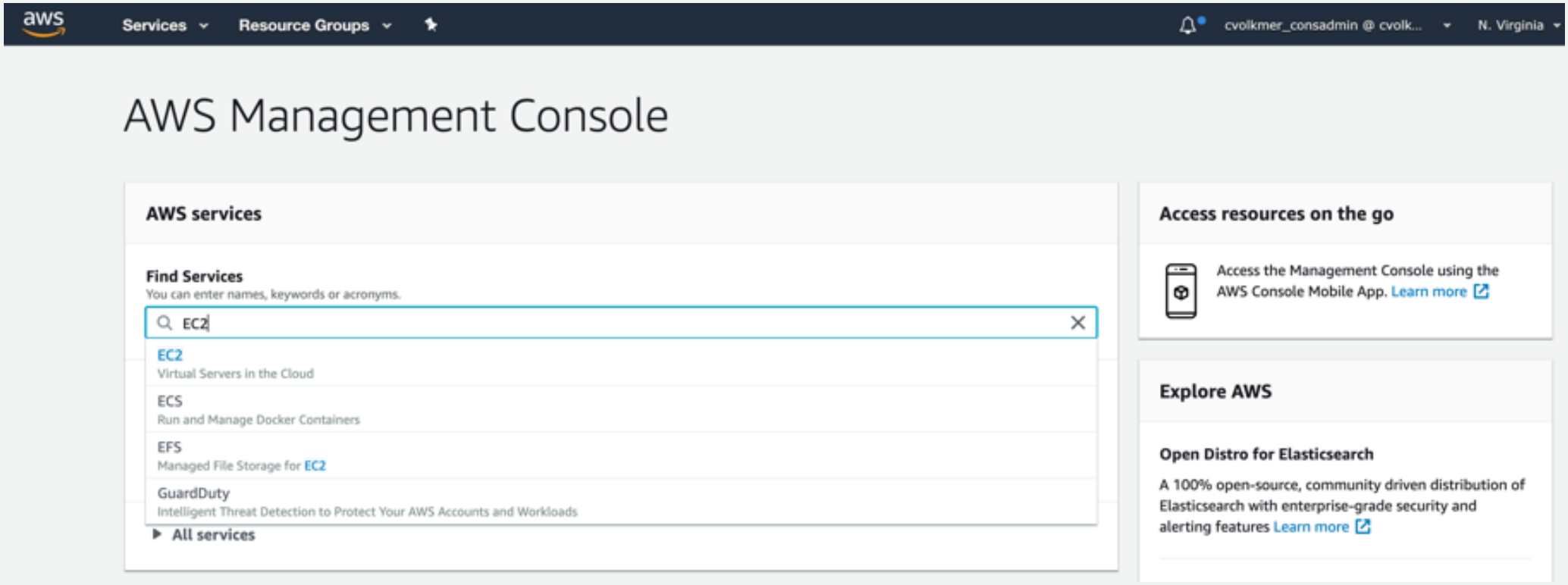


Hands-On Session

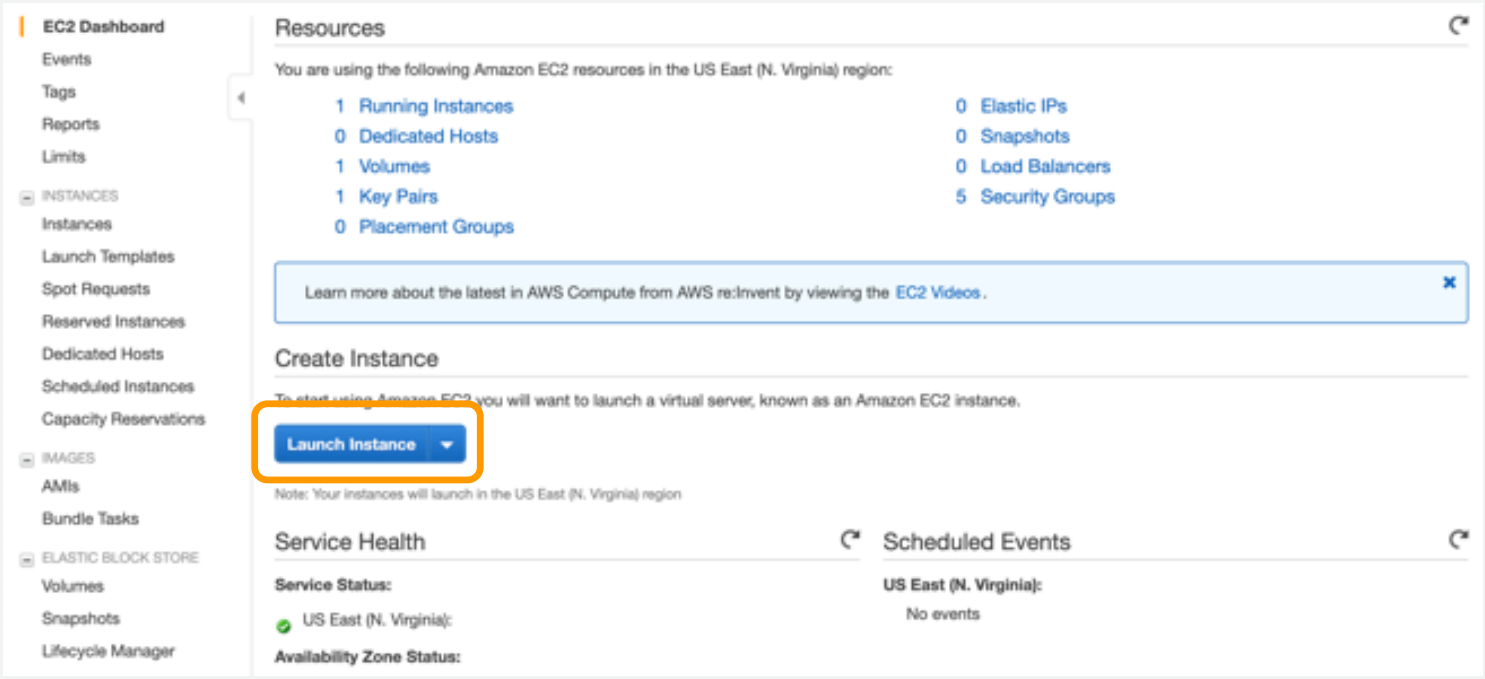
Goal: Deploy your Grails Application on EC2



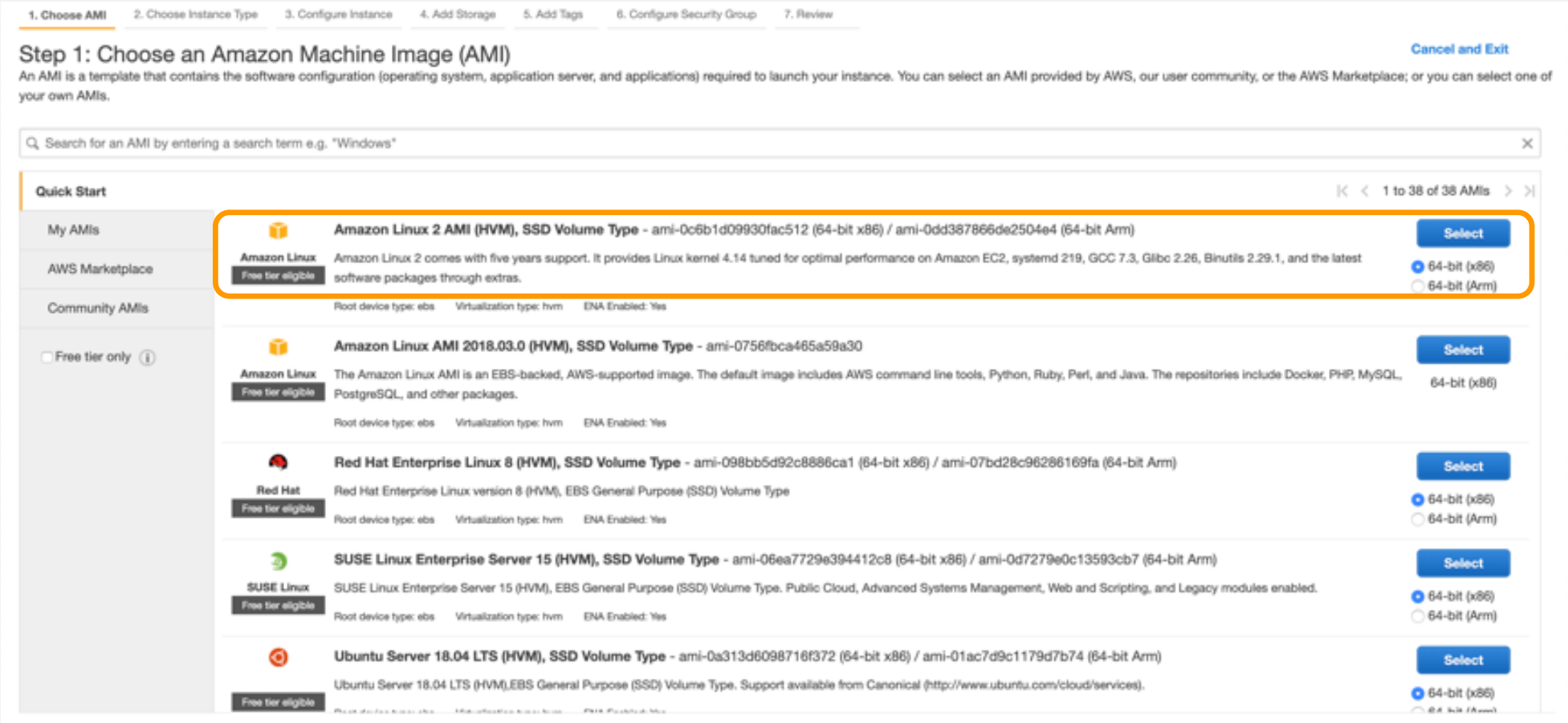
Step 1: Login to the AWS Console and open EC2 service



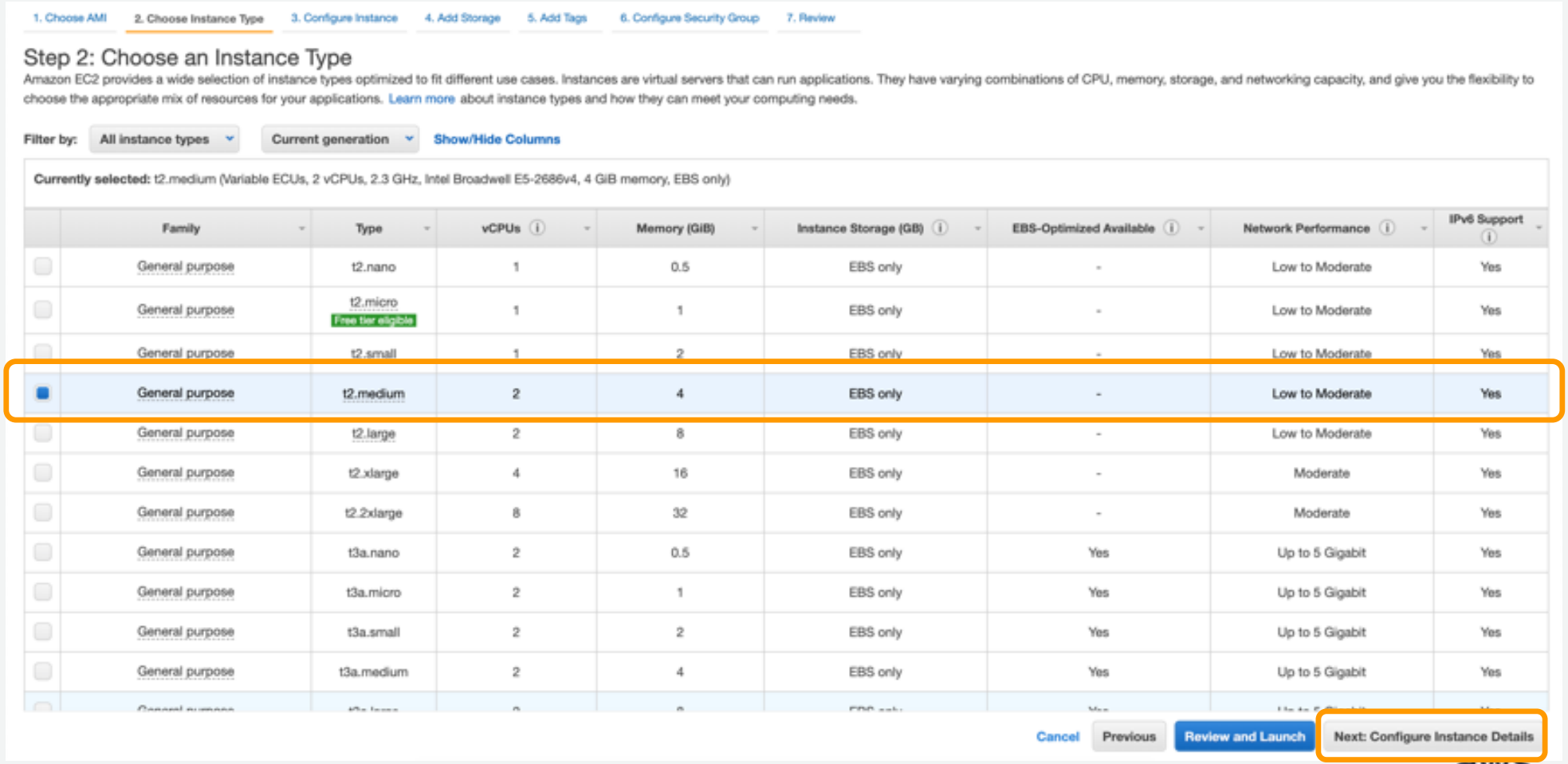
Step 2: Launch a new EC2 instance



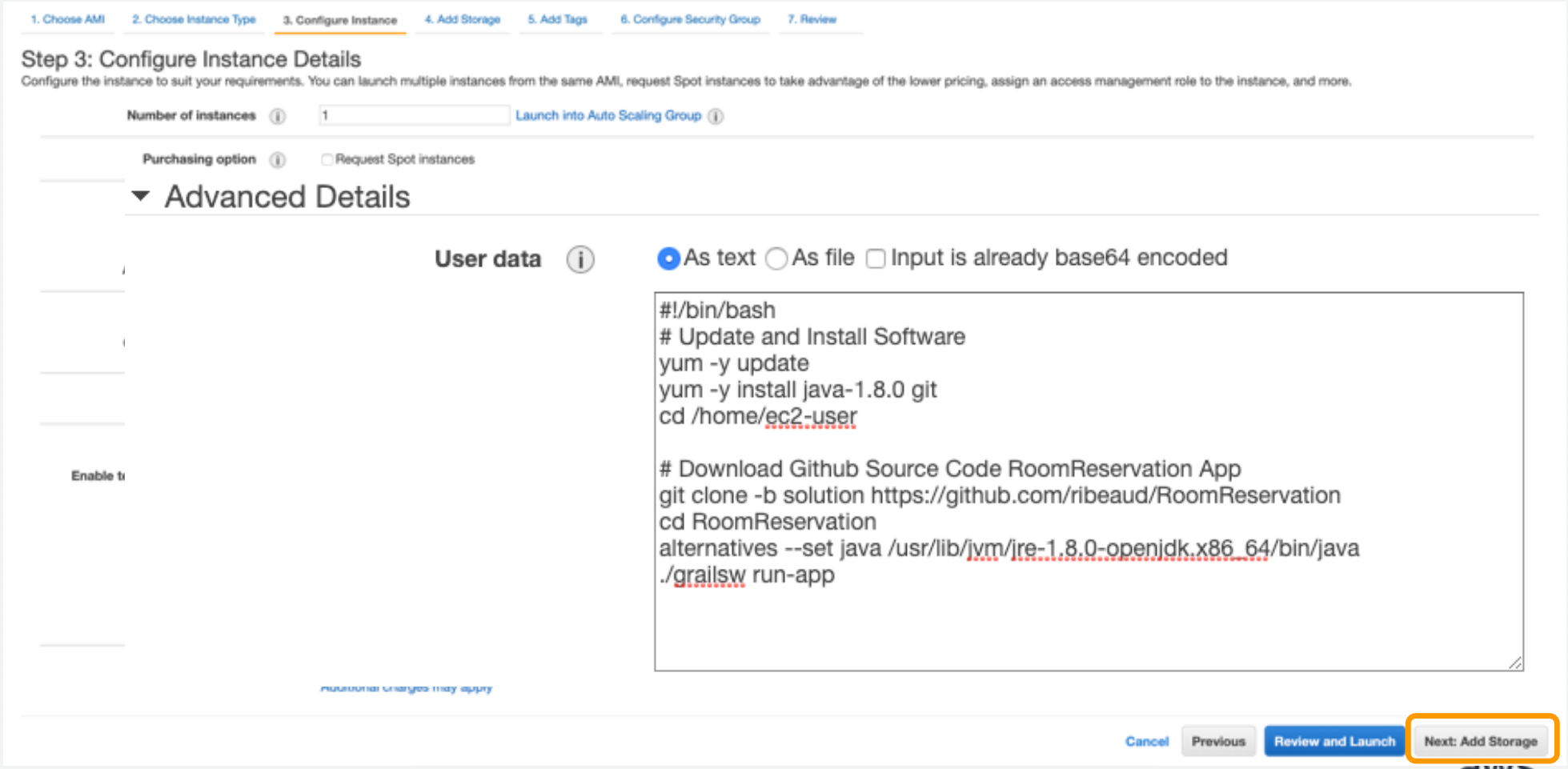
Step 3: Choose an Amazon Machine Image (AMI)



Step 4: Select the “t2.medium” Instance Type



Step 5: Enter the Bootstrap Information

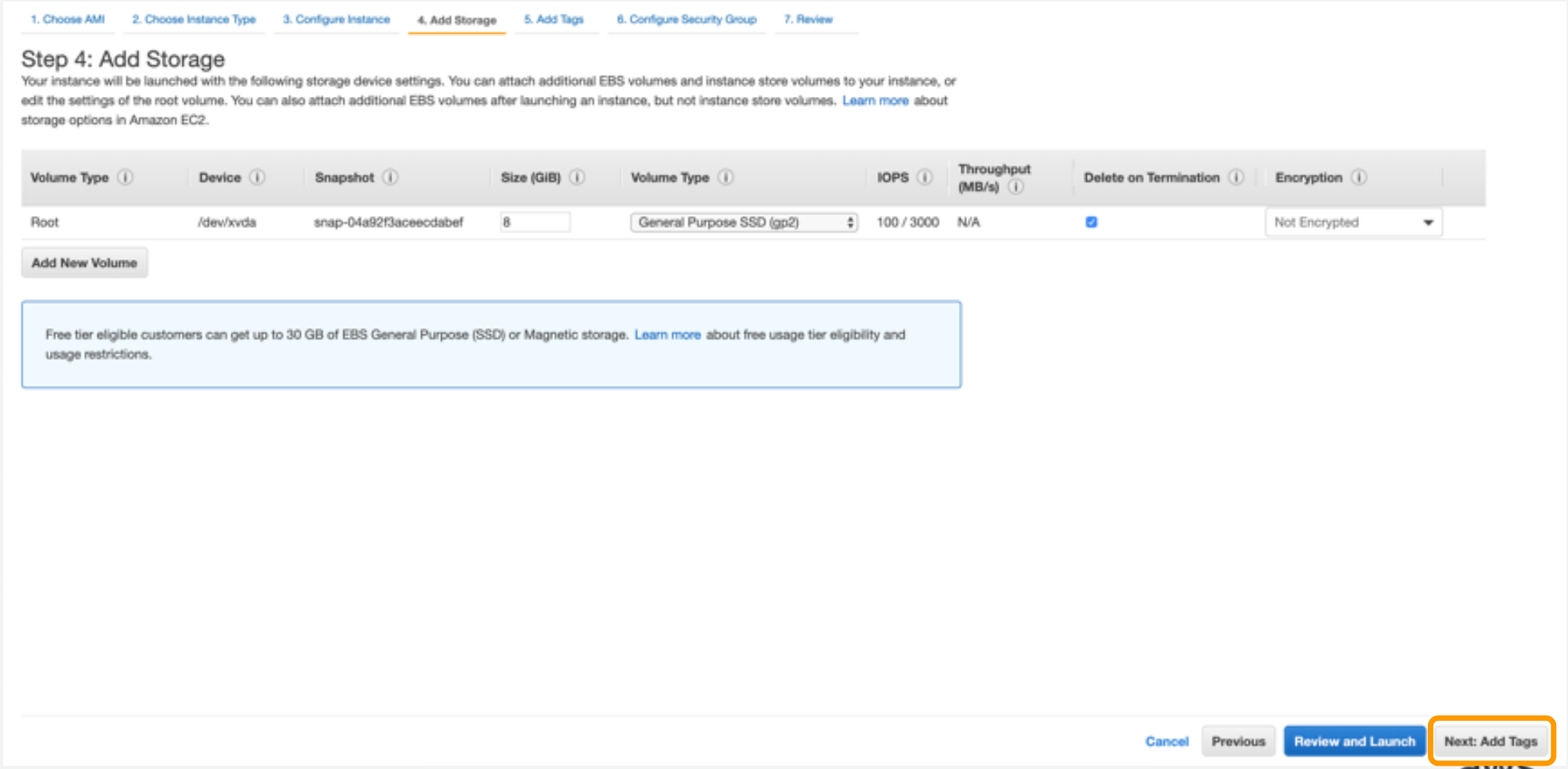


Bootstrap Script

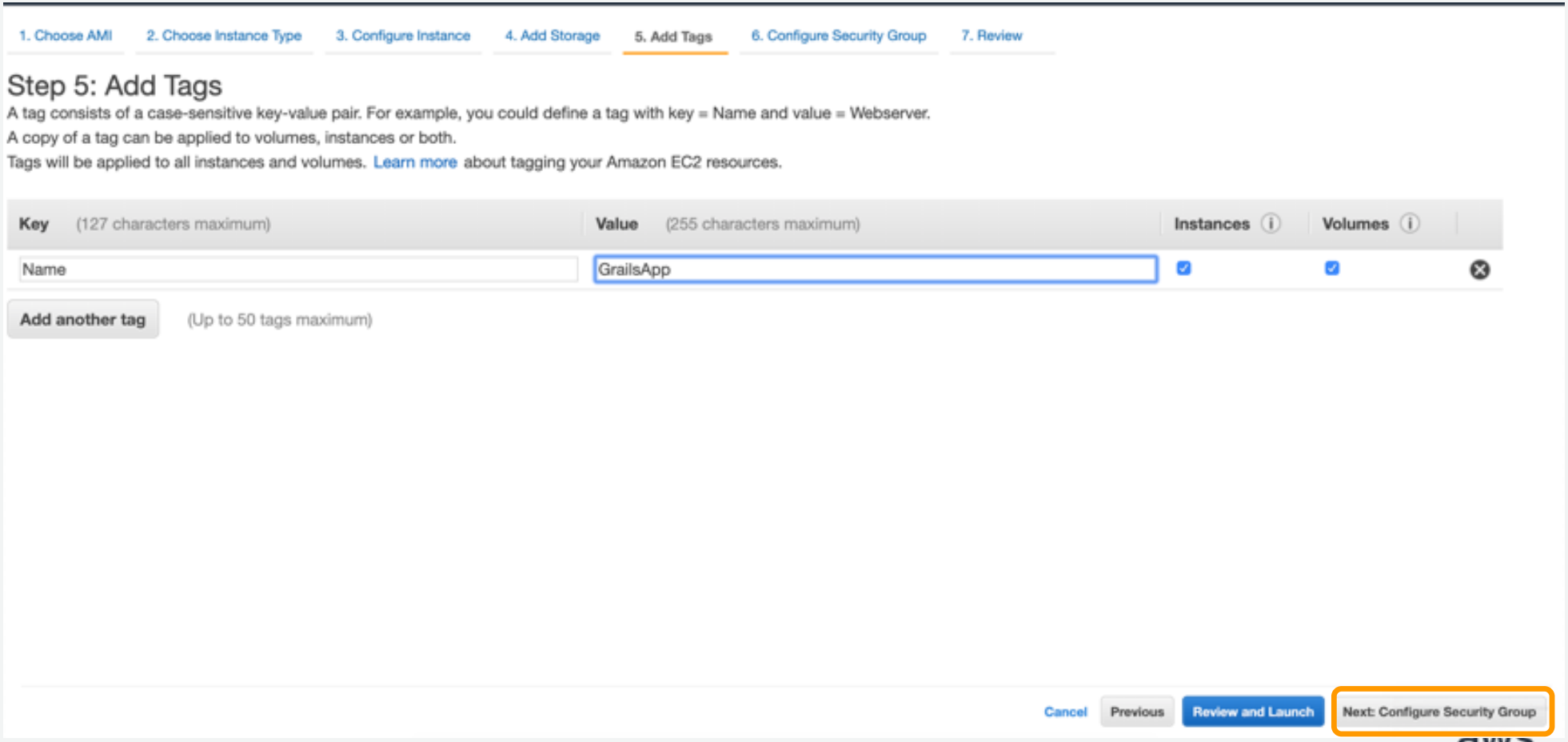
```
#!/bin/bash
# Update and Install Software
yum -y update
yum -y install java-1.8.0 git
cd /home/ec2-user

# Download Github Source Code RoomReservation App
git clone -b solution https://github.com/ribeaud/RoomReservation
cd RoomReservation
alternatives --set java /usr/lib/jvm/jre-1.8.0-openjdk.x86_64/bin/java
./grailsw run-app
```

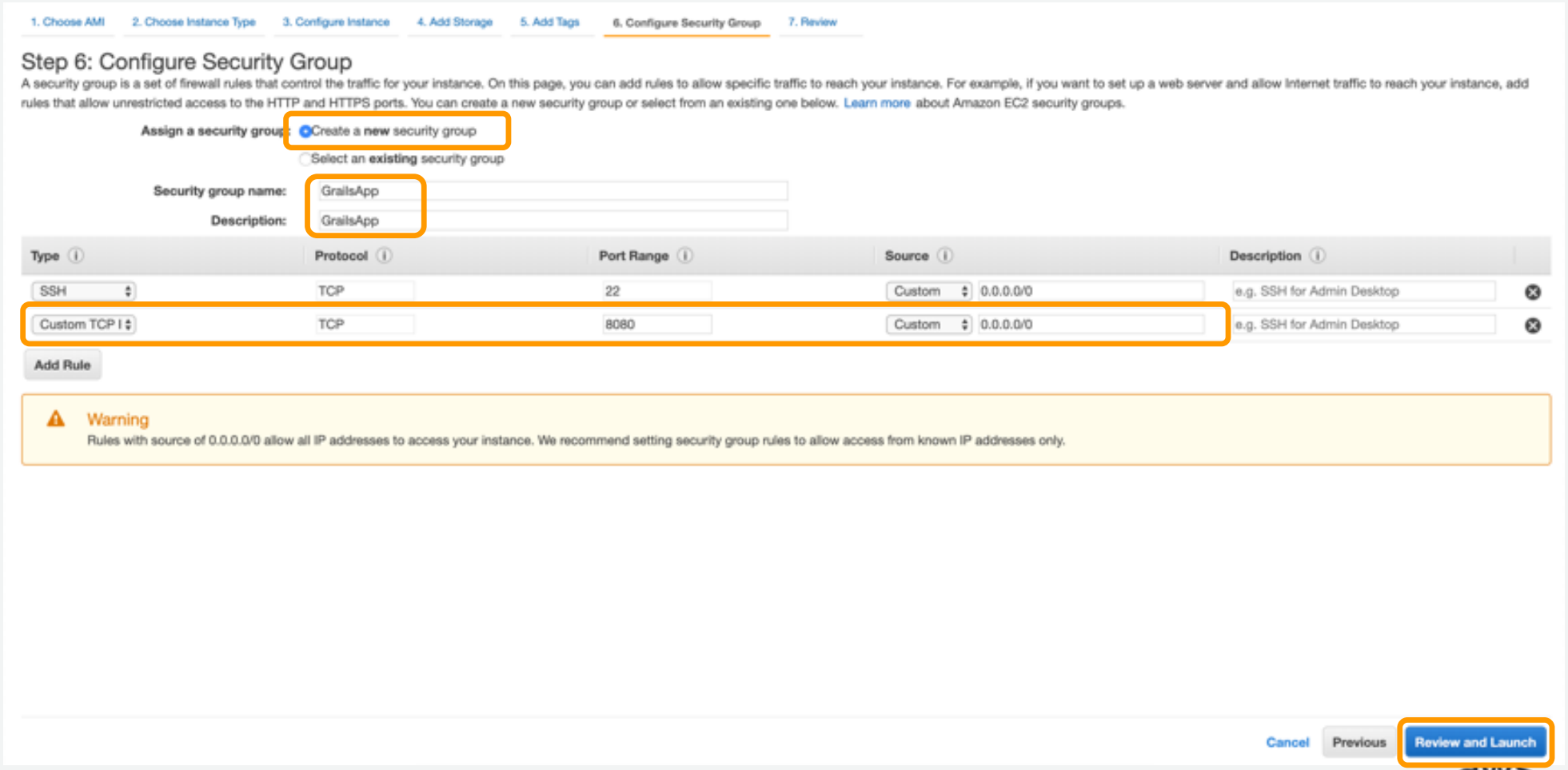
Step 6: Add a virtual harddisk



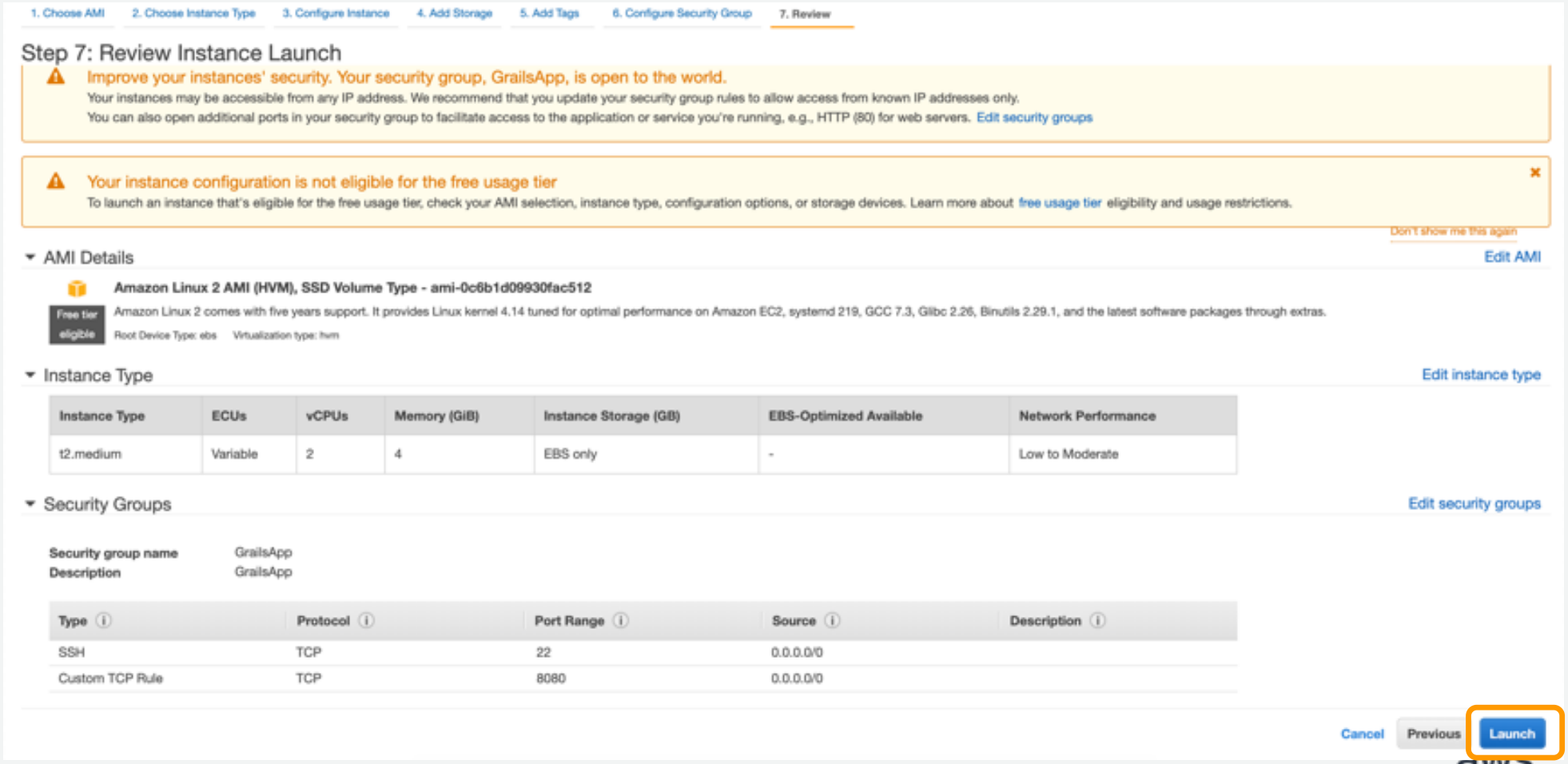
Step 7: Give your Instance a name



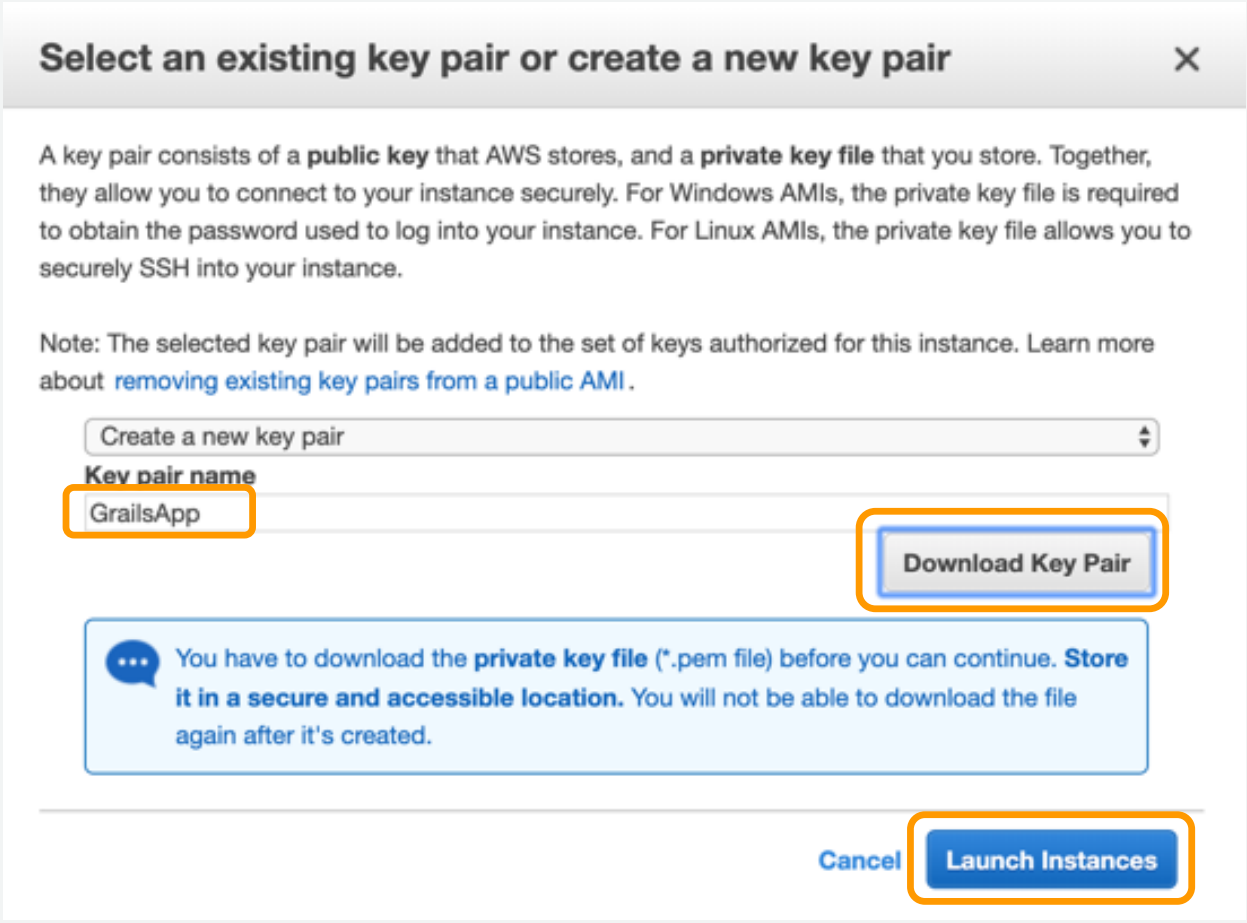
Step 8: Configure ports allowed



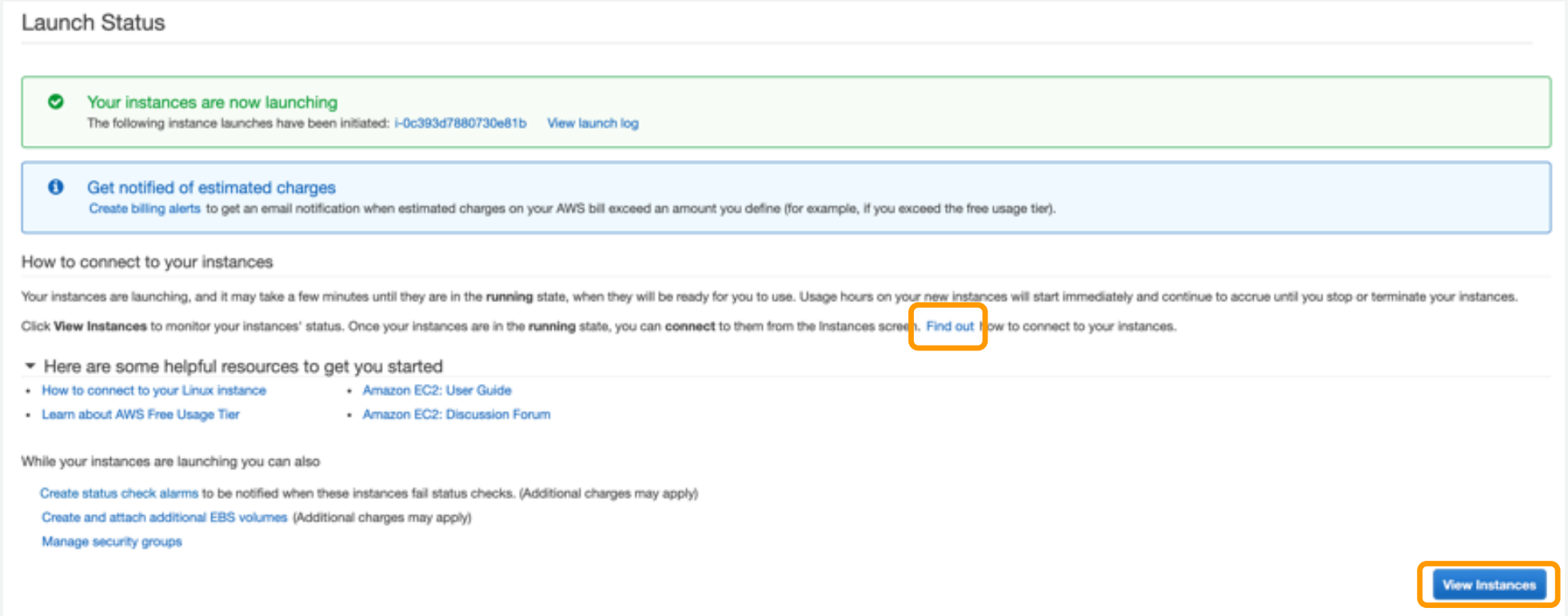
Step 9: Review the settings in launch your instance



Step 10: Create and download your key pair

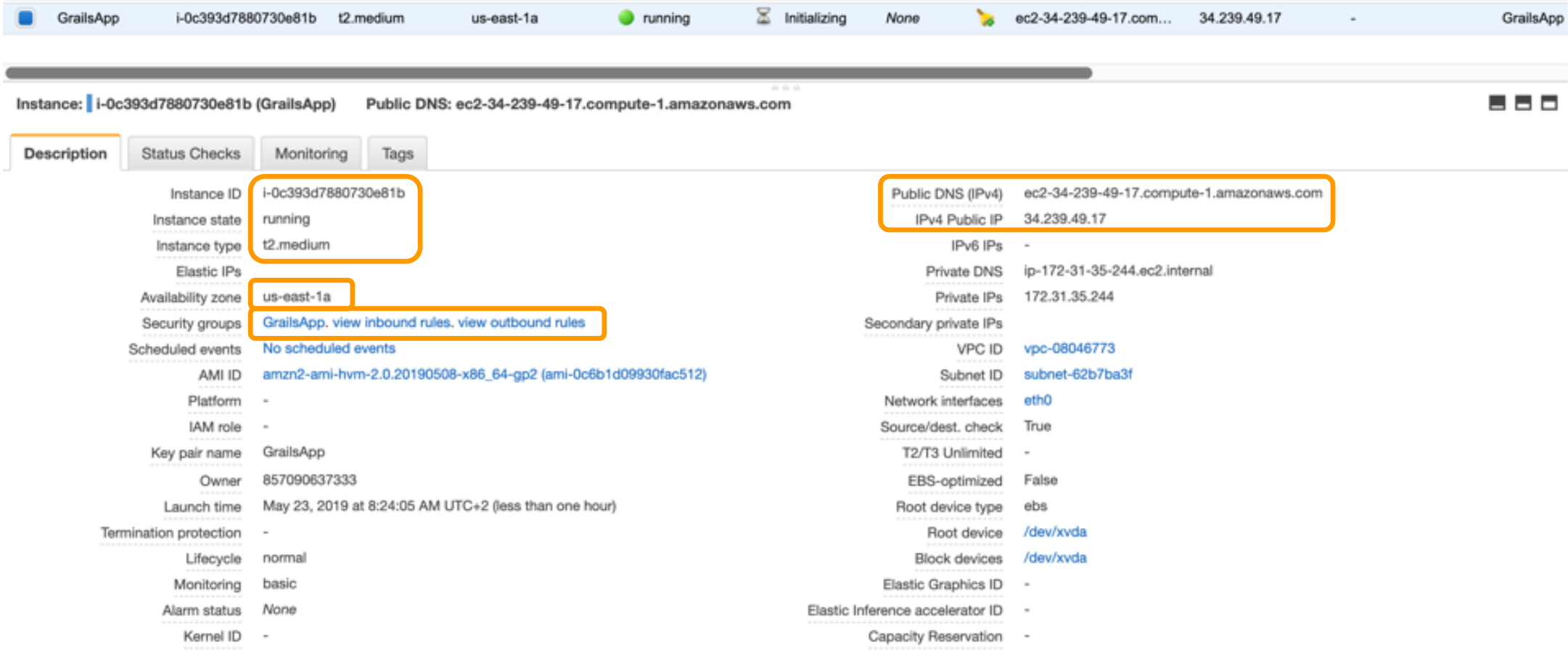


Step 11: Close the wizard and return to the EC2 console

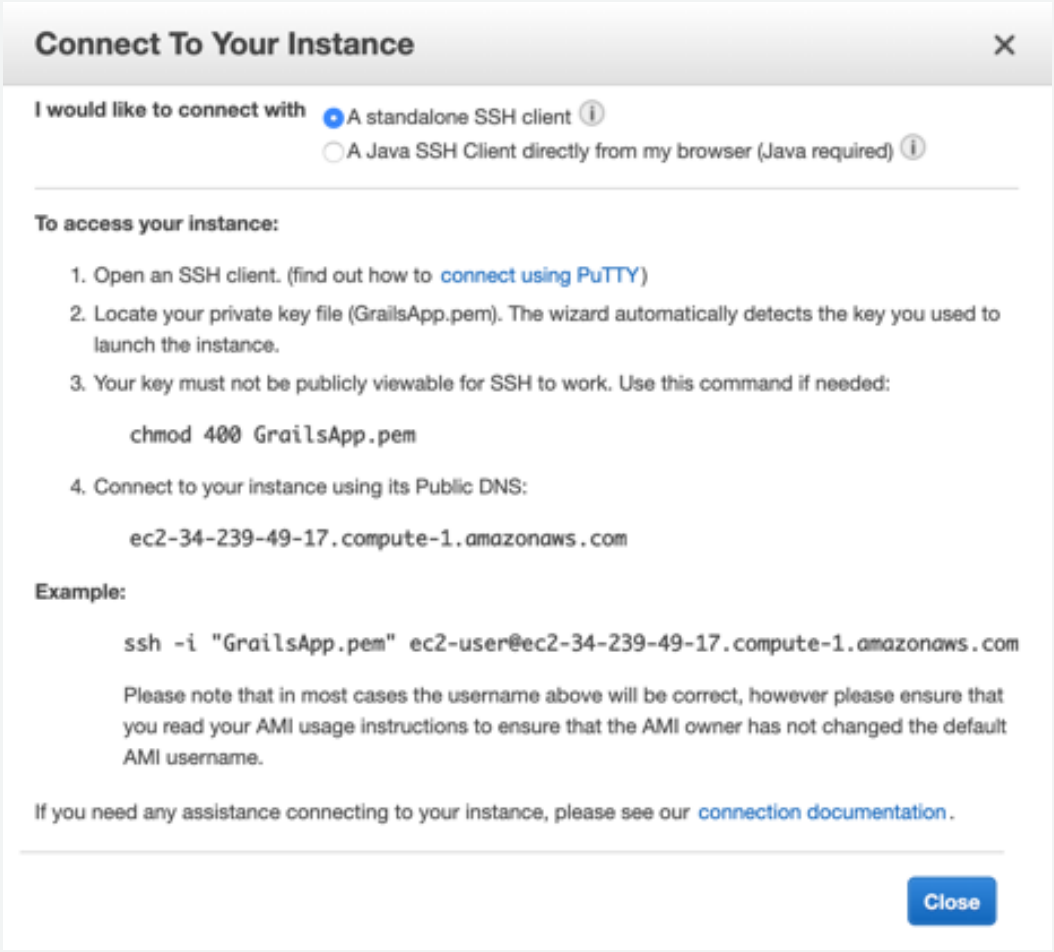


https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstances.html?icmpid=docs_ec2_console

Step 12: Explore the instance details

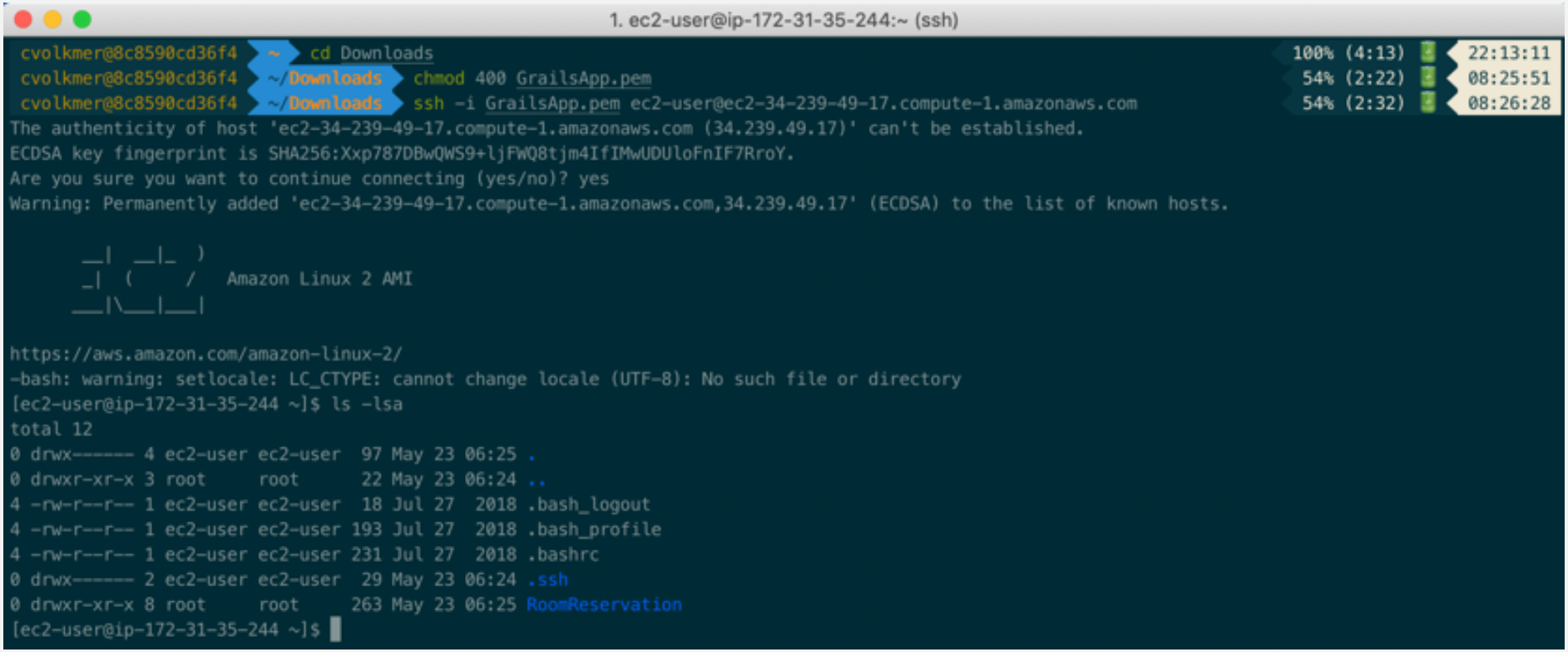


Step 13: Connect to your instance (ssh)



Windows Users have to convert their private key file (.pem) using puttygen to a .ppk in order to login with putty https://amzn.to/2HxksoR

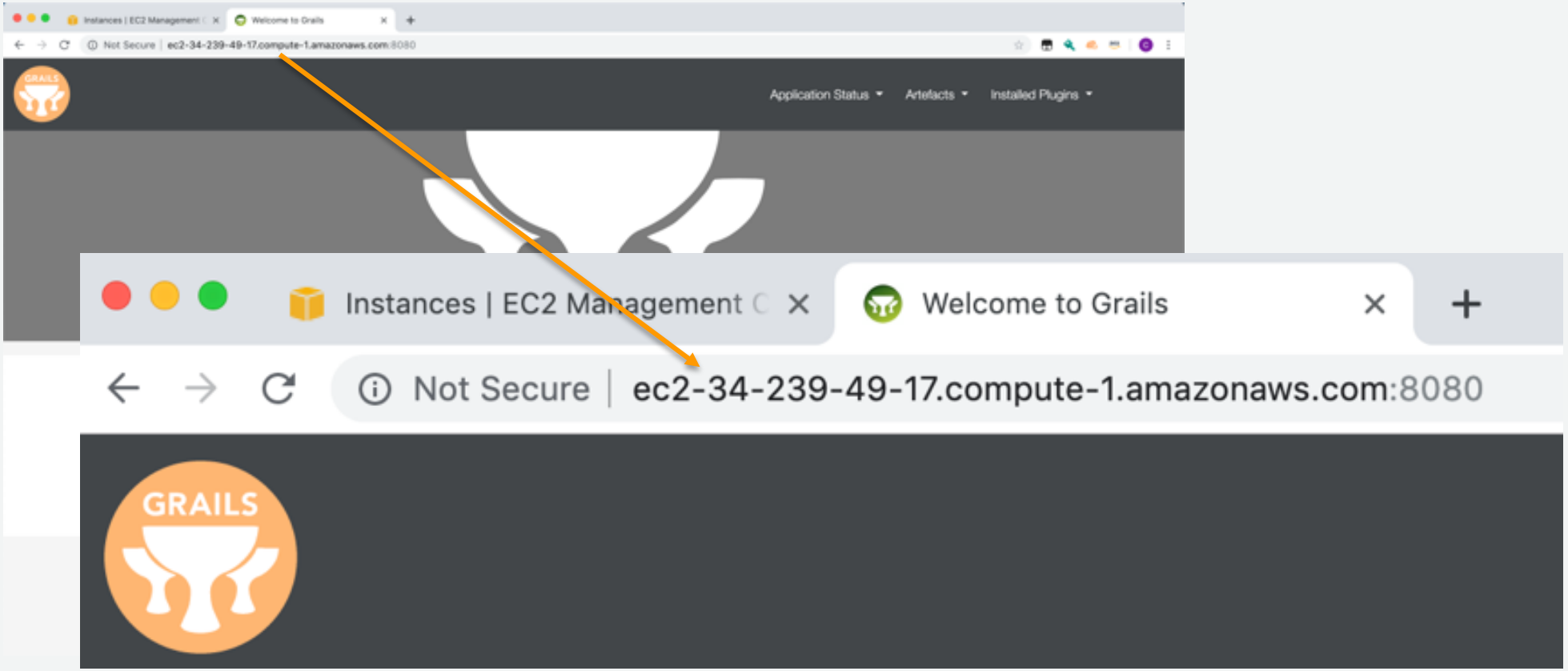
Step 14: Explore the VM directories, log files



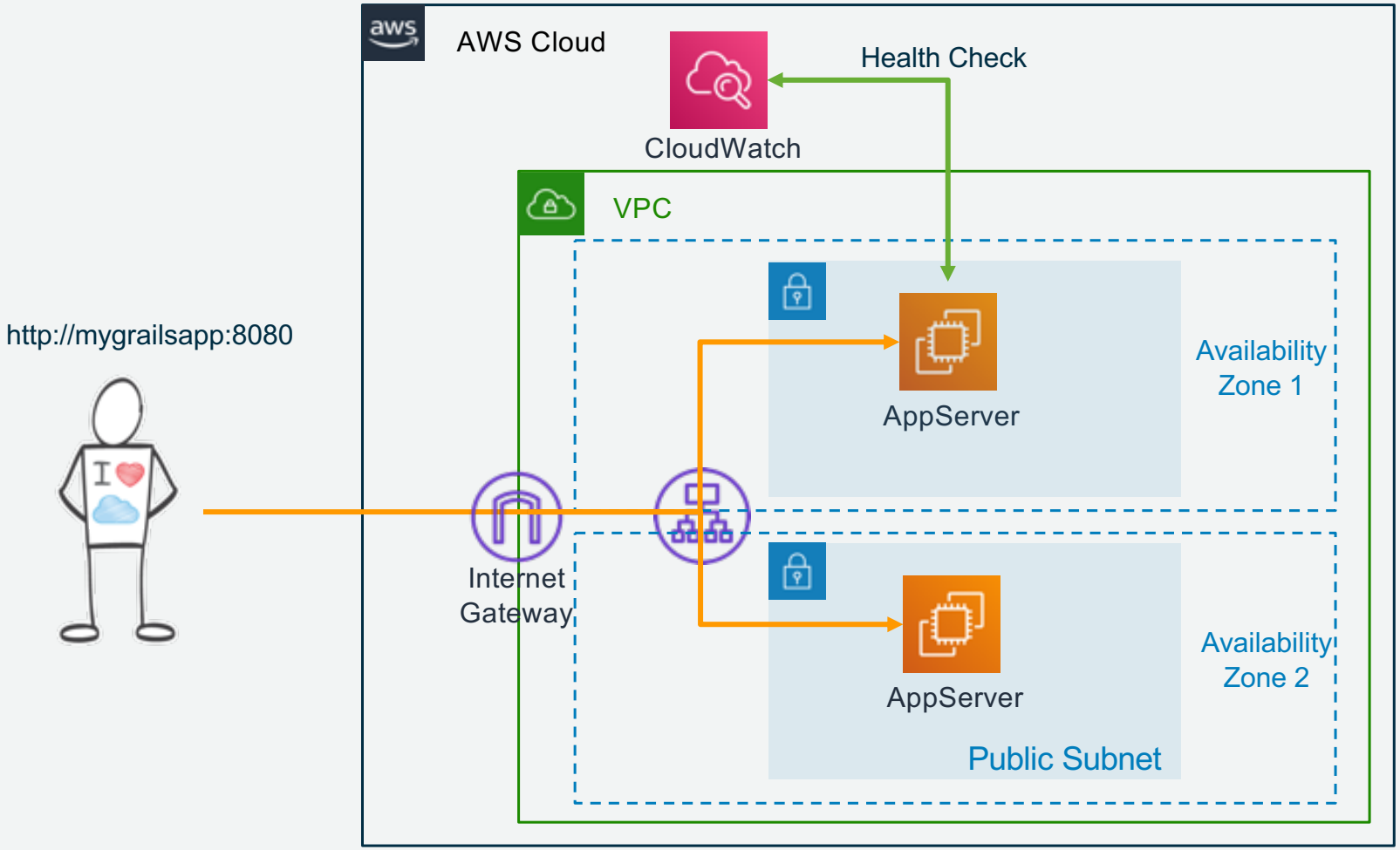
The logfile from the bootstrap script is stored under /var/log/cloud-init-output.log

aws

Step 15: Check your application – Paste your Hostname from the EC2 console in your browser



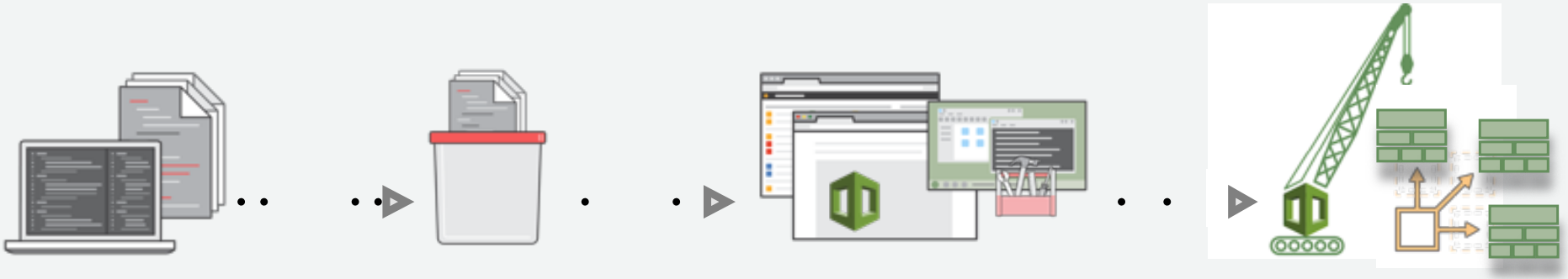
Add a Load Balancer to your Artchitecture



Develop and Deploy

AWS CloudFormation at a glance

Enables provisioning and management of your infrastructure as code



Code in YAML or JSON directly or use sample templates

Upload local files or from an S3 bucket

Create stack using console, API, or CLI

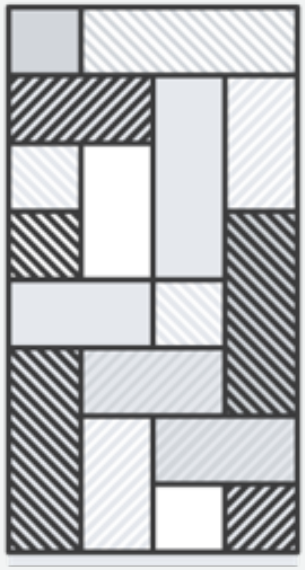
Stacks and resources are provisioned

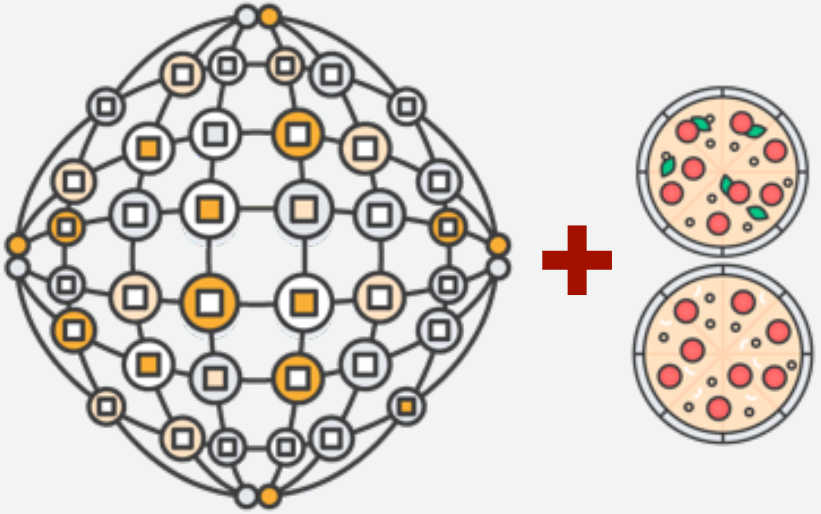
CloudFormation Demo

Development transformation at Amazon: 2001-2009

2001

2009



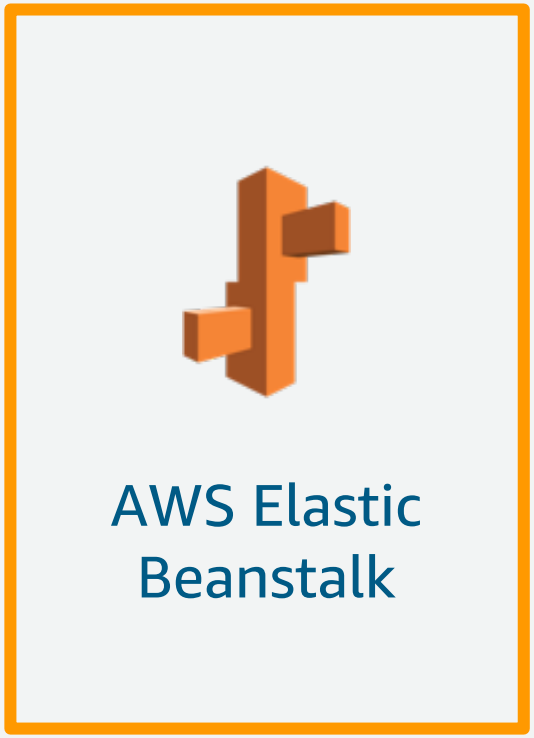


monolithic
application + teams

microservices + 2 pizza teams

aws

AWS Elastic Beanstalk



Provisions and operates the infrastructure and manages the application stack for you

Completely transparent—you can see everything that is created

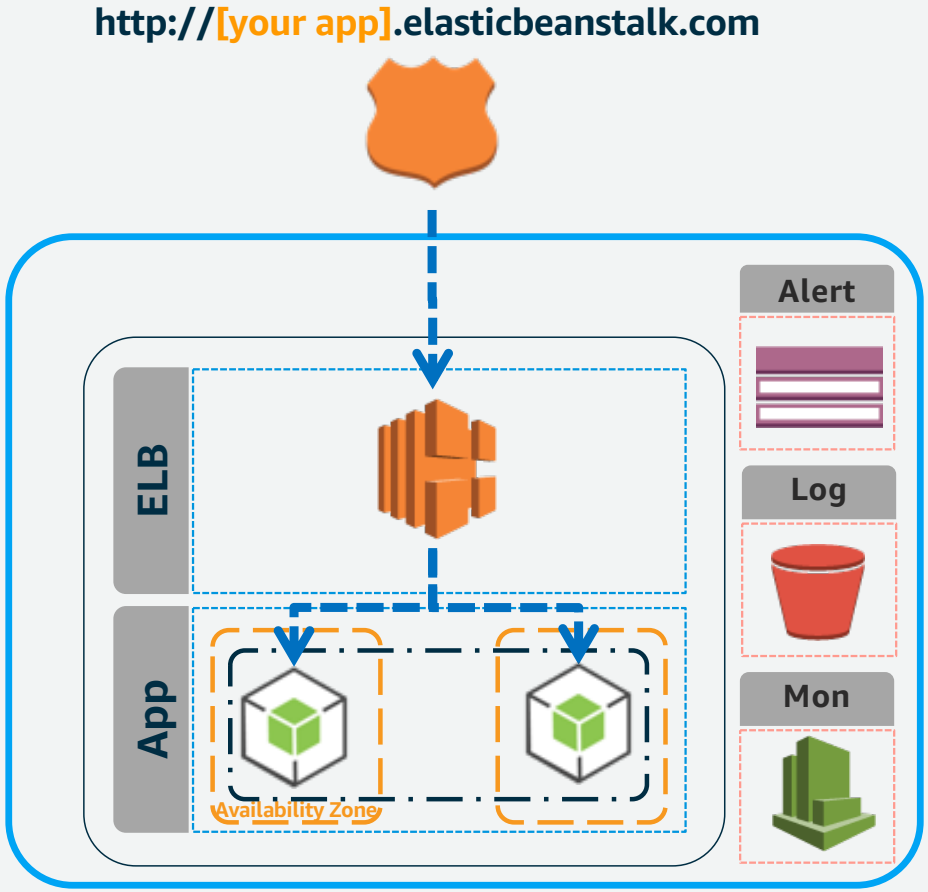
Impossible to outgrow; automatically scales your application up and down

High-Level Architecture

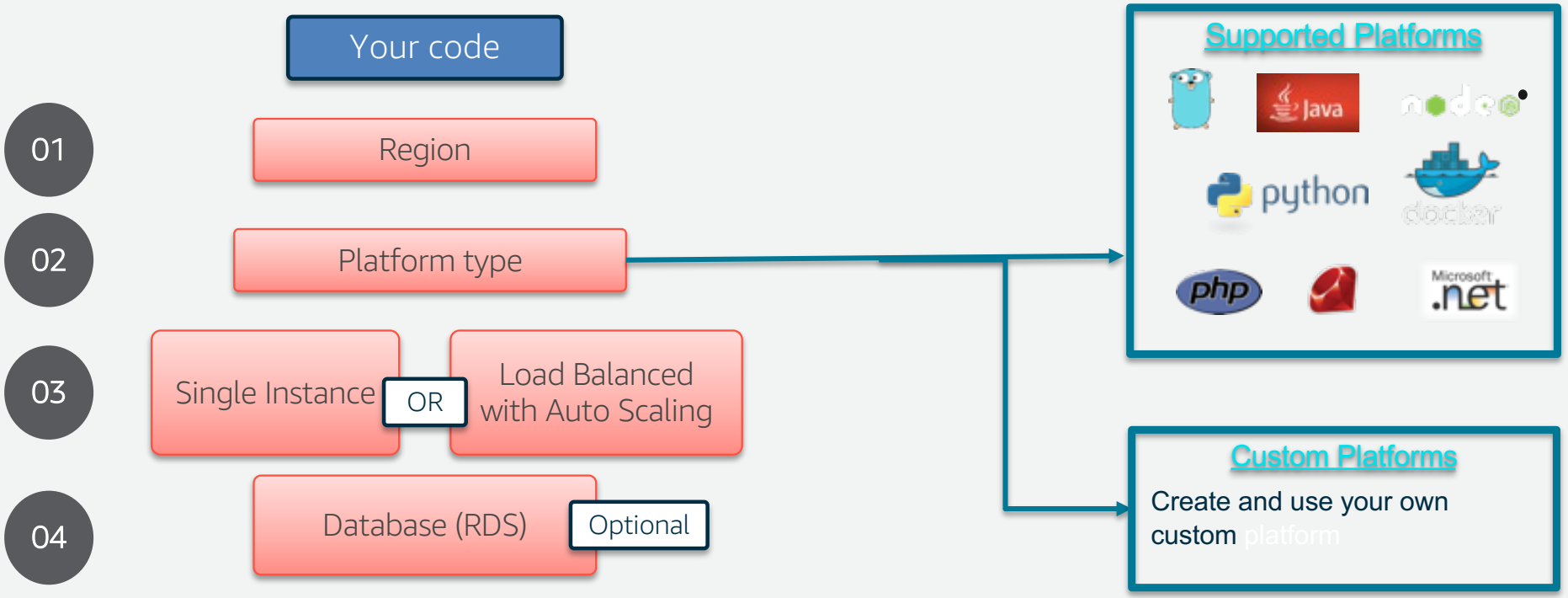
Elastic Beanstalk provisions necessary infrastructure resources

Elastic Beanstalk provides you with a unique domain name for your application environment (e.g., yourapp.elasticbeanstalk.com).

You can resolve your own domain name to this domain name with Route 53



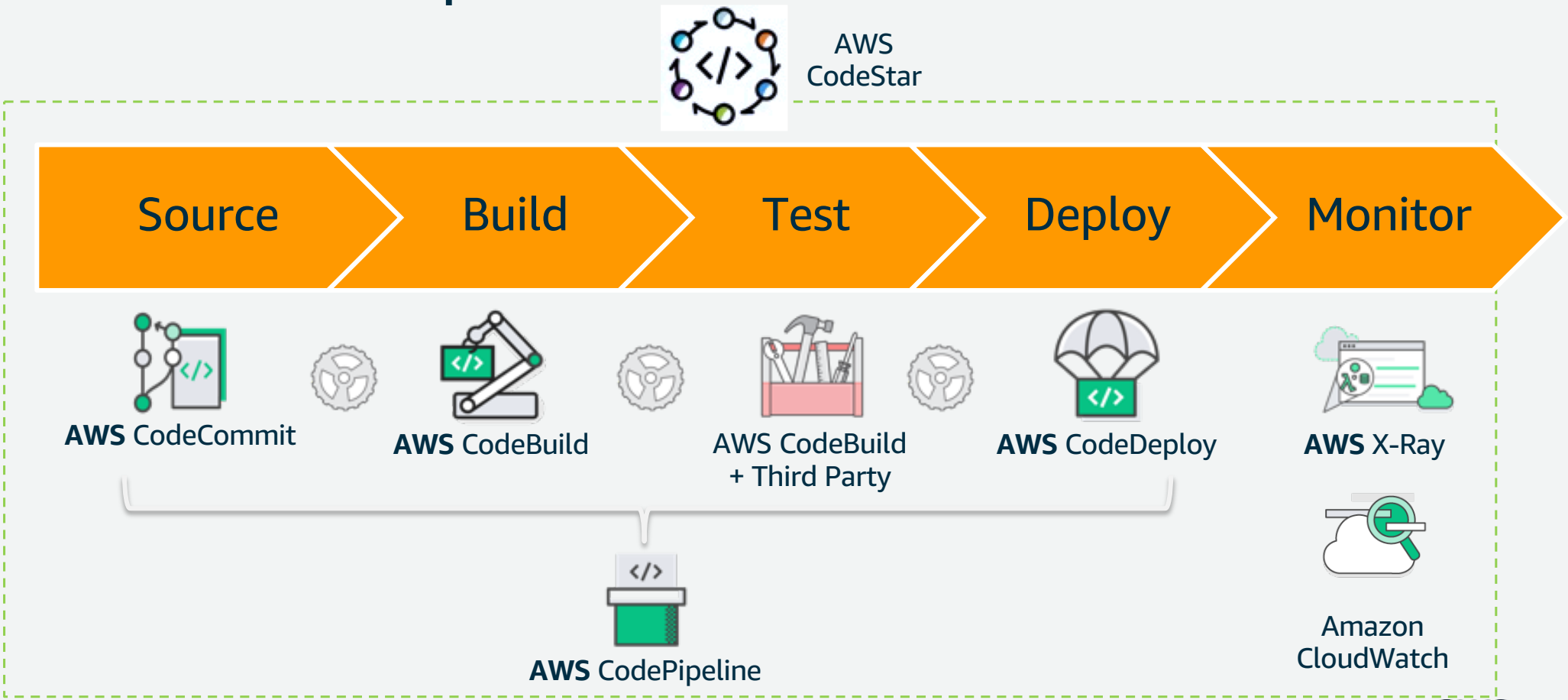
How to deploy an application



Elastic Beanstalk Demo

AWS Code Services

Software release steps



Code* Demo

Helpful Resources

Getting started:
https://aws.amazon.com/getting-started/?nc1=h_ls

AWS Free Tier:
https://aws.amazon.com/free/

Online Training (partially free):
https://www.aws.training/LearningLibrary