



AWS Introduction

Building / Deploying Applications in the Cloud

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Agenda

Theorie Teil 1

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

Pause

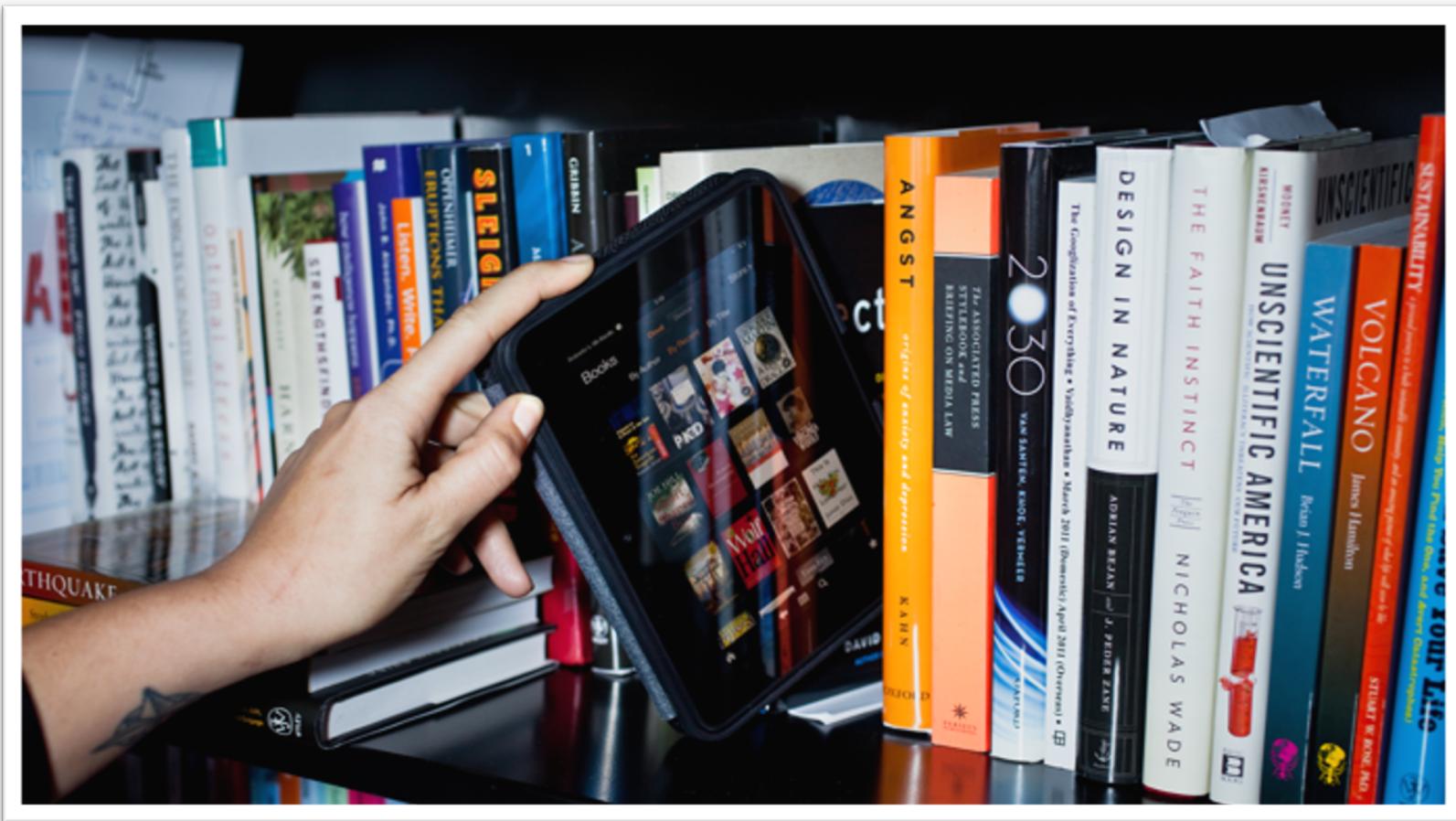
Hands-On Lab

Pause

Theorie Teil 2

- Automation
- Development Tools

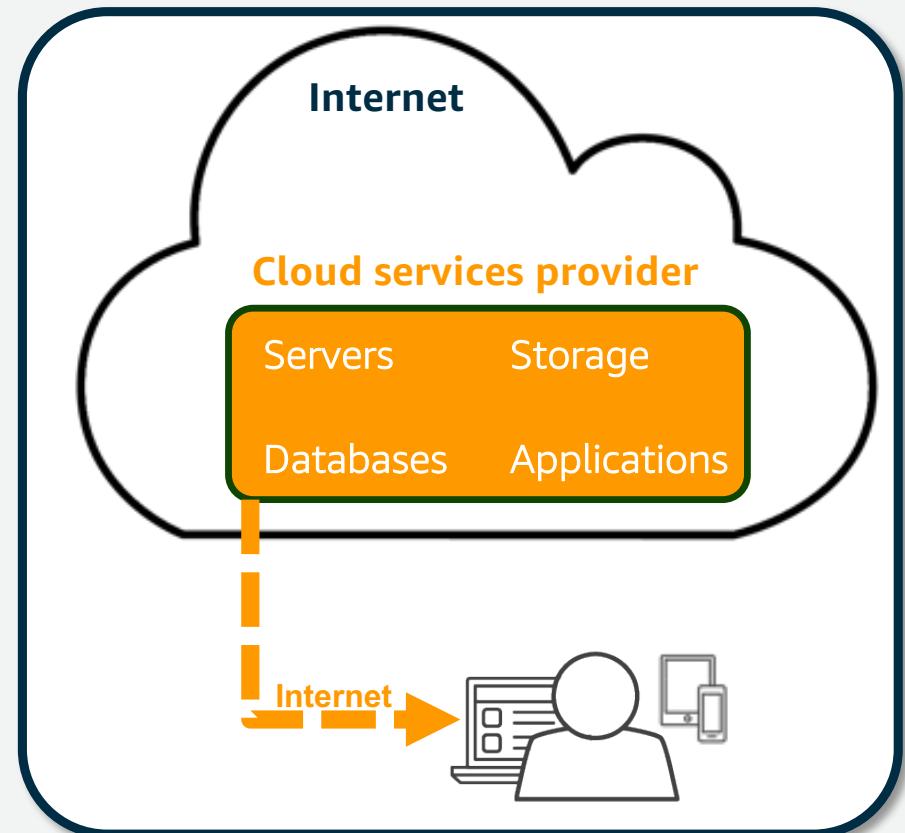
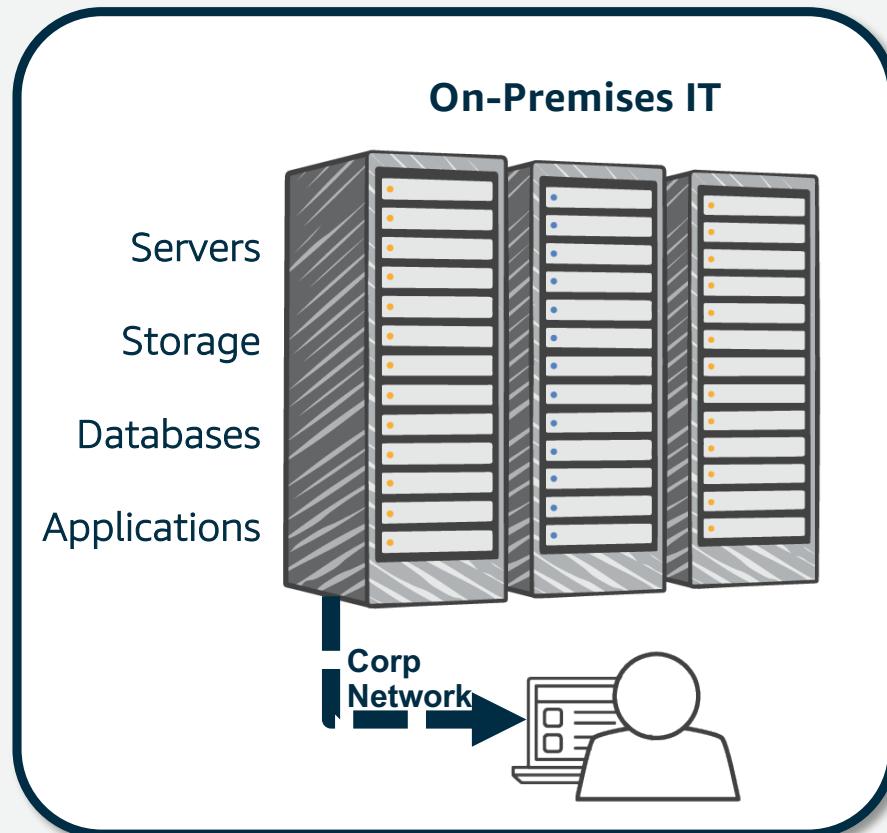
In 1994 Amazon Started with Books...



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What is Cloud Computing?



AWS Global Infrastructure

22 regions, 69 availability zones, 1 Local Zone, 210 points of presence



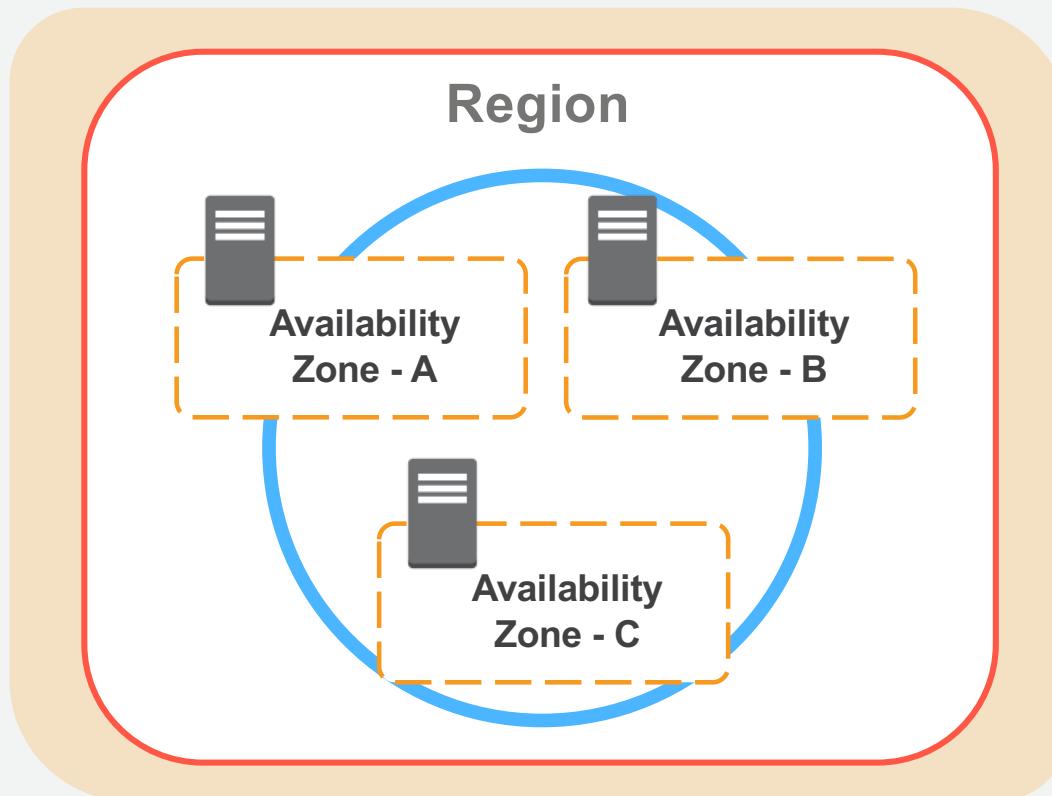
Announced: Indonesia, Italy, South Africa, Spain

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

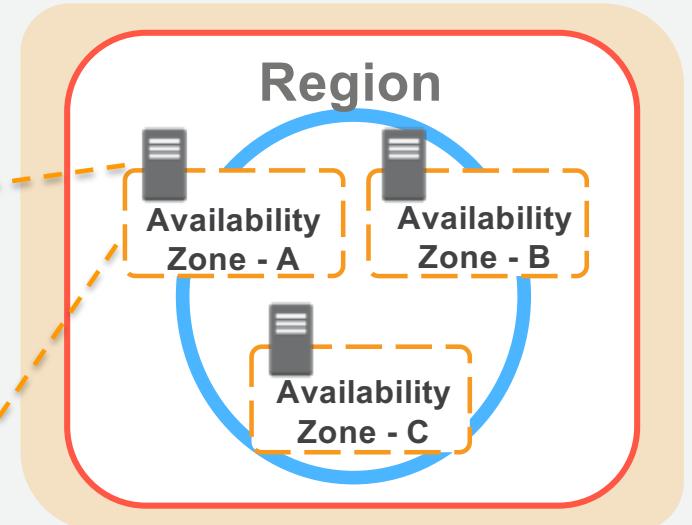
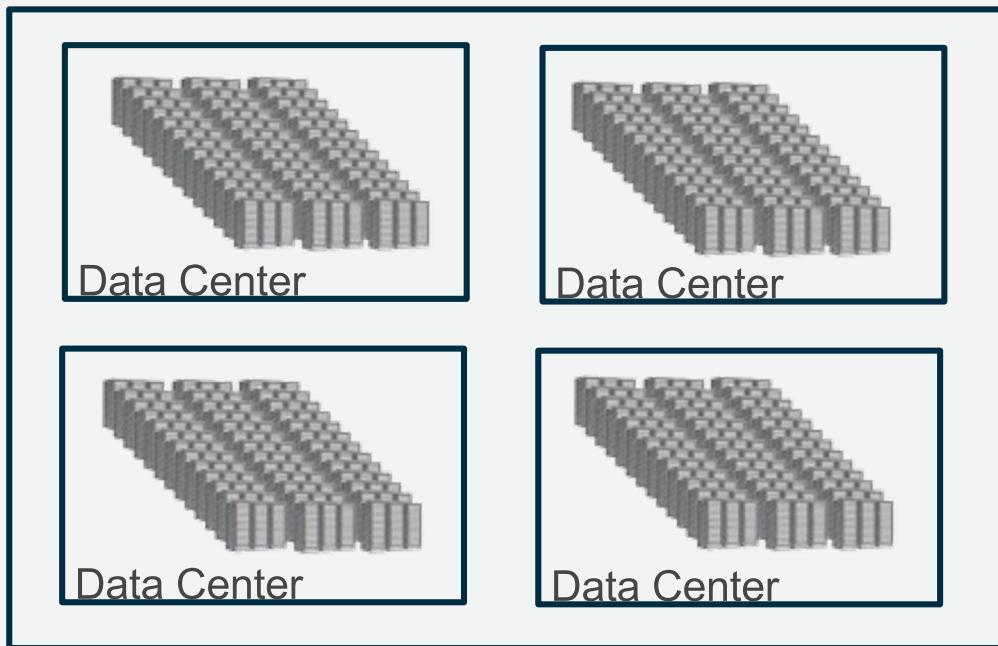
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Ensuring High Availability



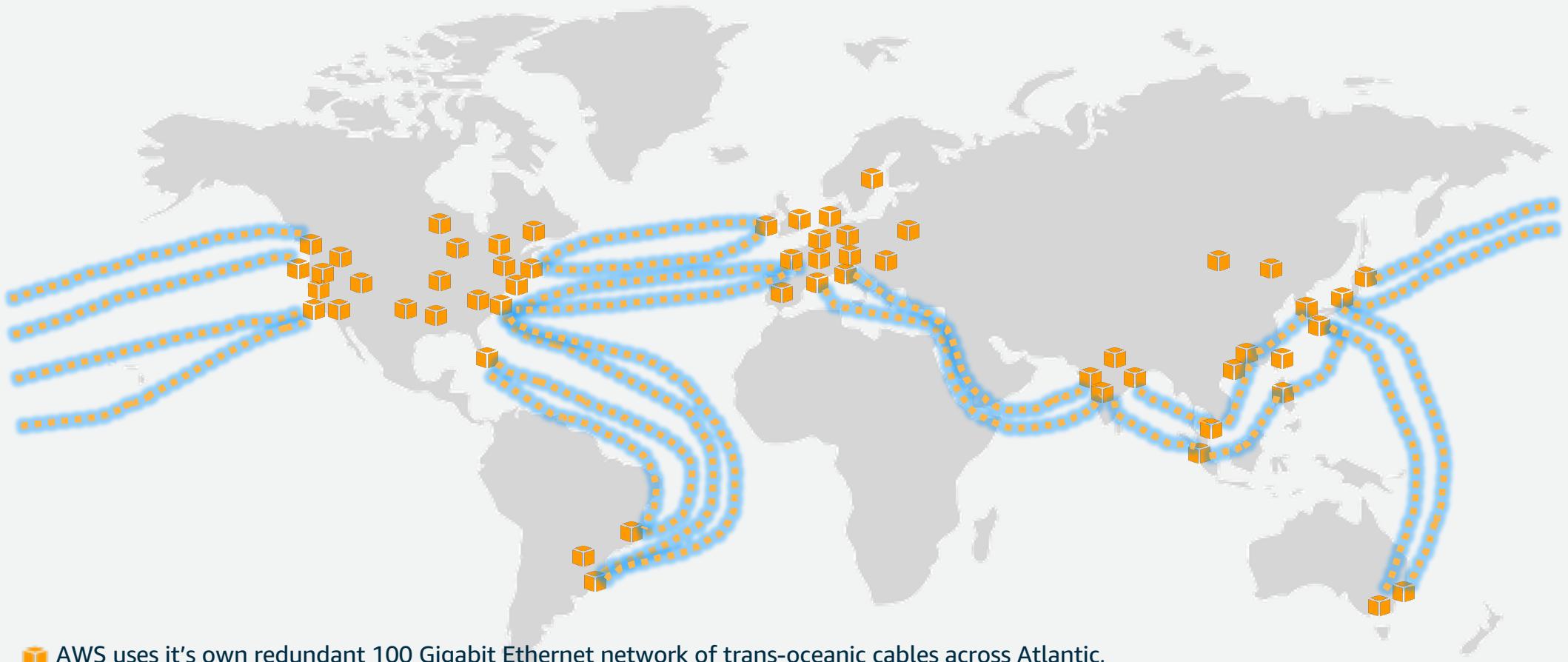
Example AWS Availability Zone



- 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

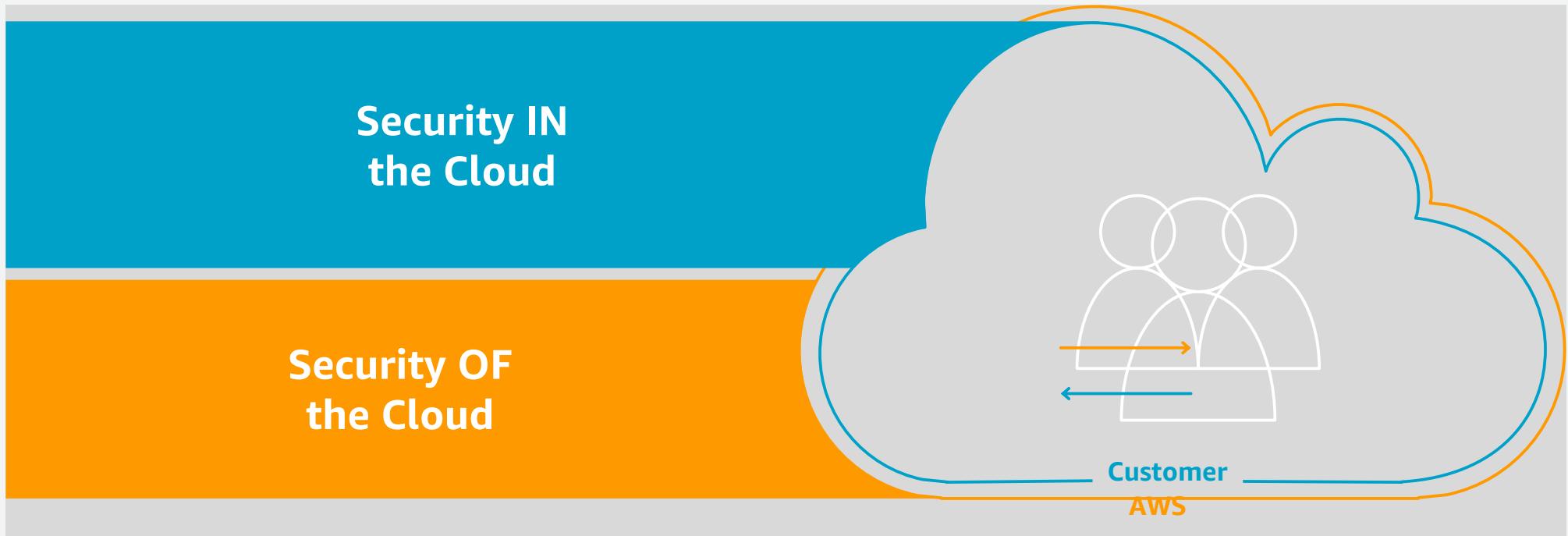


- AWS uses its own redundant 100 Gigabit Ethernet network of trans-oceanic cables across Atlantic, Pacific and Indian Oceans and the Mediterranean, Red and South China Seas.

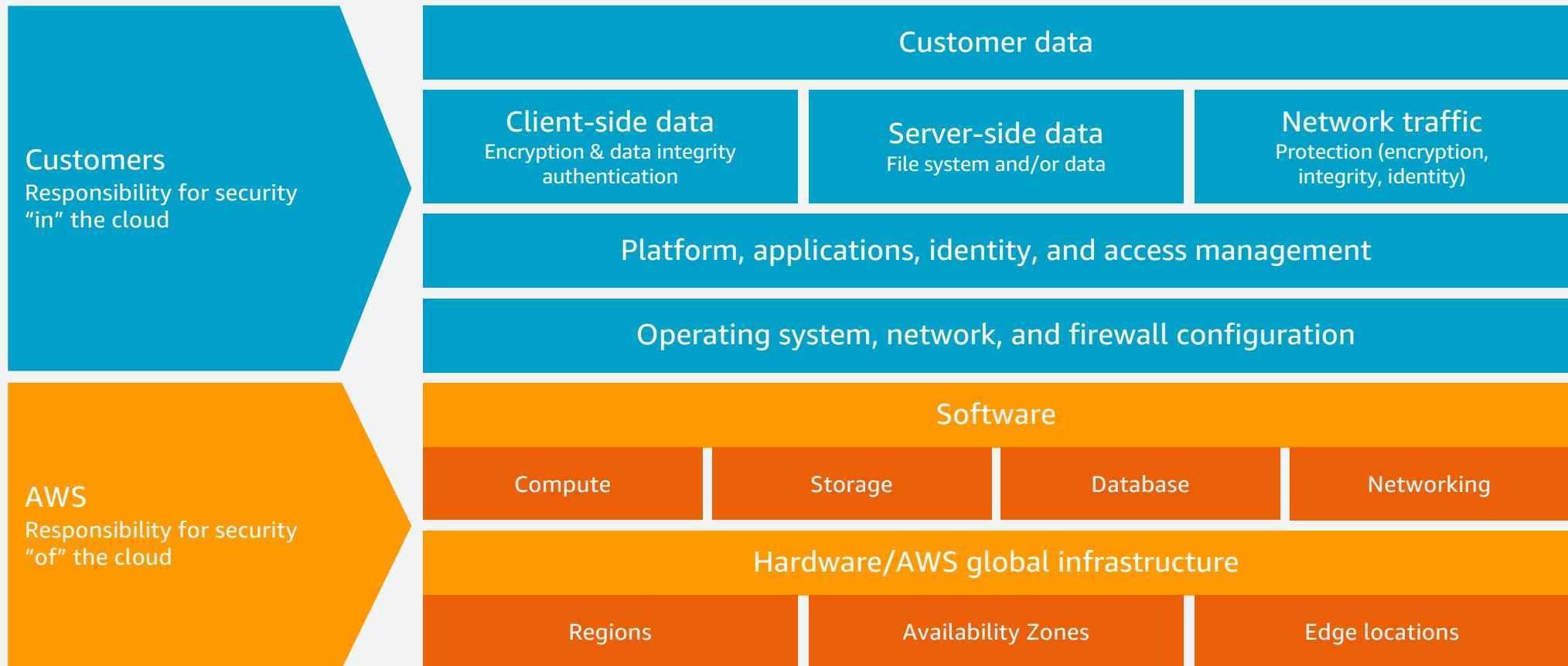
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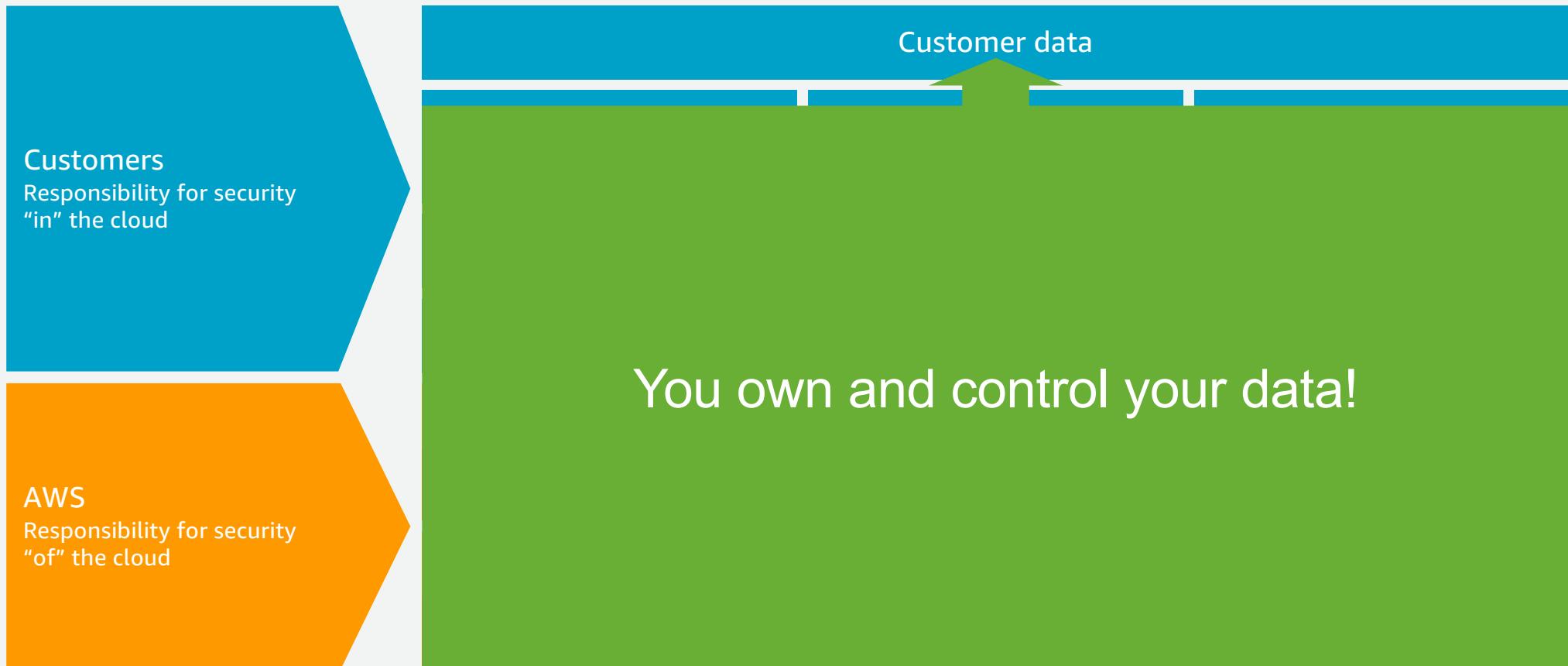
Shared responsibility model



Understanding the AWS Shared Responsibility Model



Understanding the AWS Shared Responsibility Model

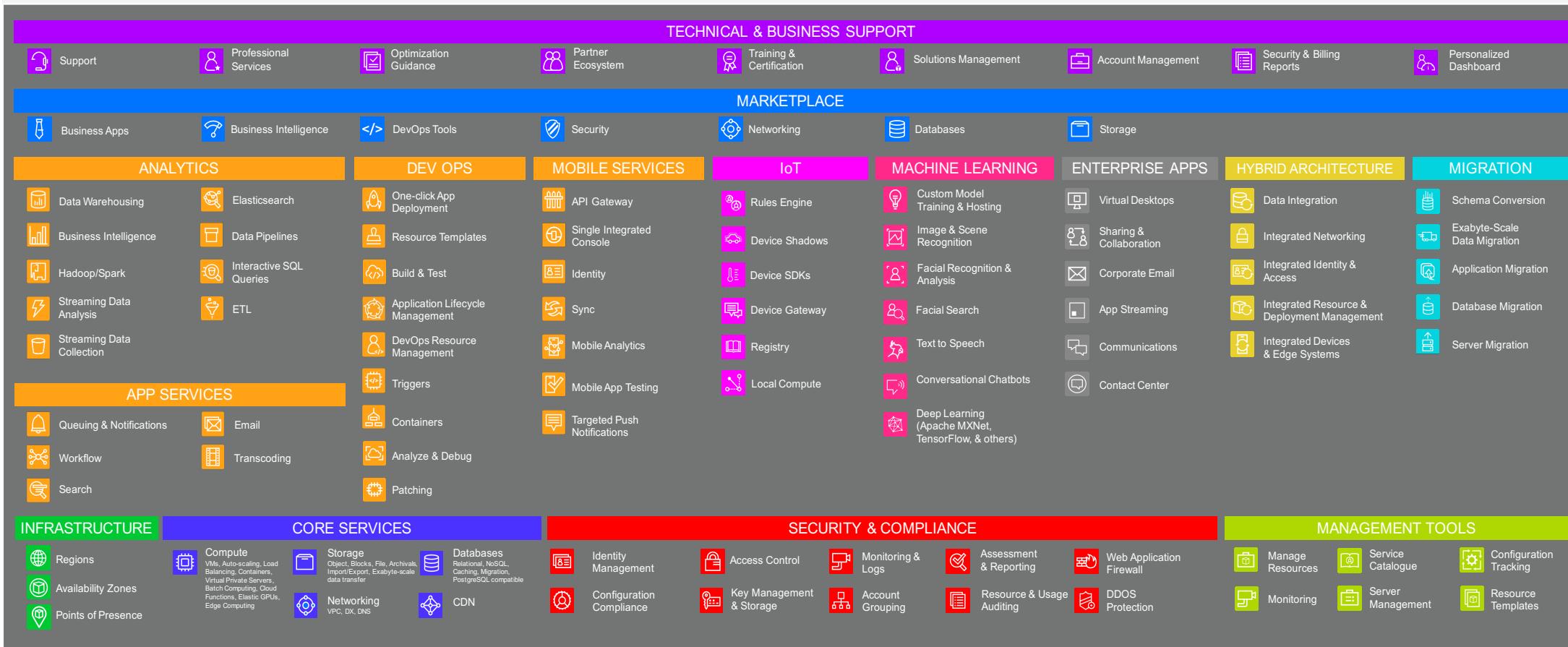


AWS Pace of Innovation

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.



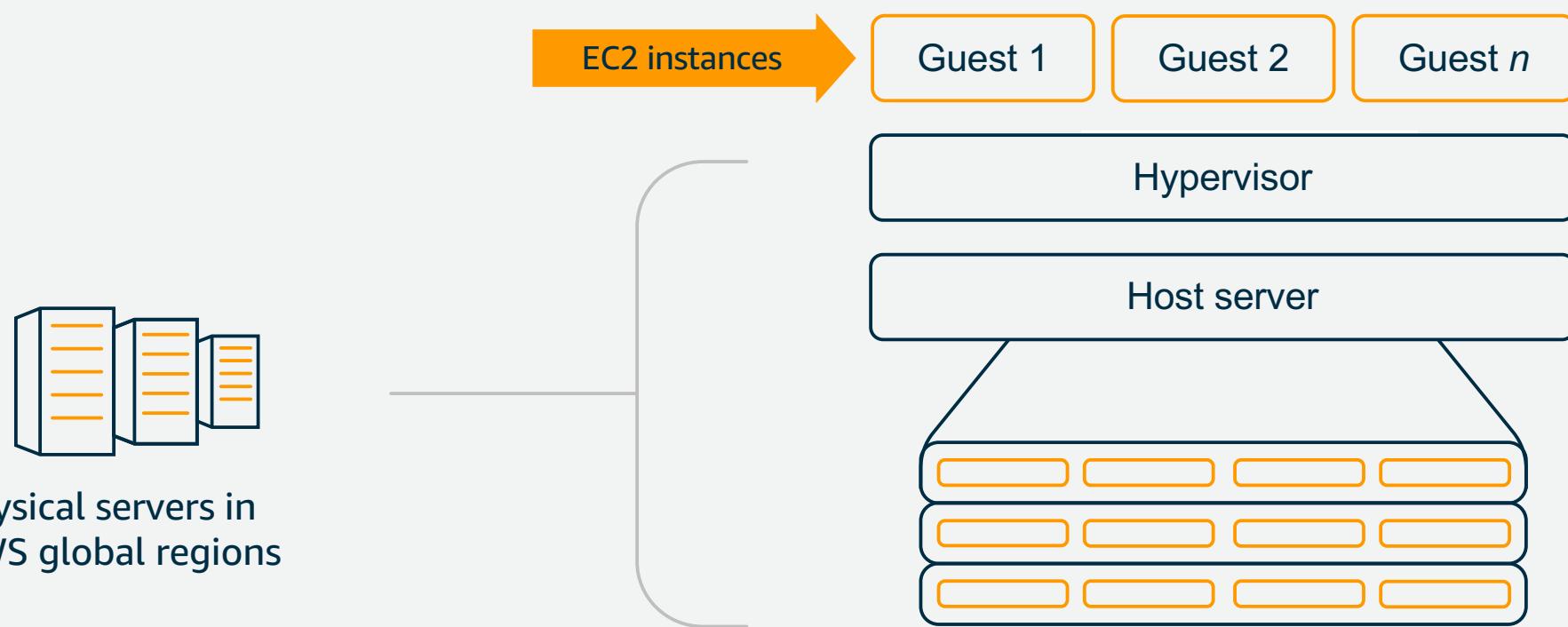
The AWS Platform



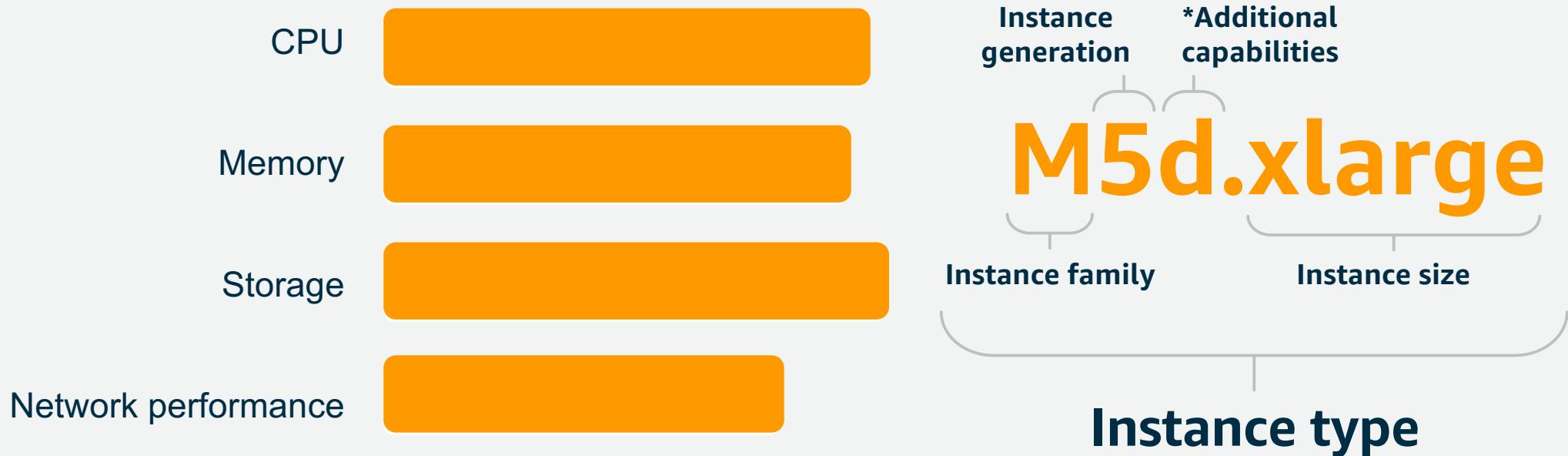


Amazon Elastic Compute Cloud (EC2)

Virtual servers in the cloud



Amazon EC2 instance characteristics



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

Broadest and deepest platform choice

Categories	Capabilities	Options
General purpose	Choice of processor (AWS, Intel, AMD)	
Burstable	Fast processors (up to 4.0 GHz)	
Compute intensive	High memory footprint (up to 12 TiB)	Elastic Block Store
Memory intensive	Instance storage (HDD and NVMe)	Elastic Inference
Storage (High I/O)	Accelerated computing (GPUs and FPGA)	
Dense storage	Networking (up to 100 Gbps)	
GPU compute	Bare Metal	
Graphics intensive	Size (Nano to 32xlarge)	

270 +
instance types

for virtually every
workload and
business need

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

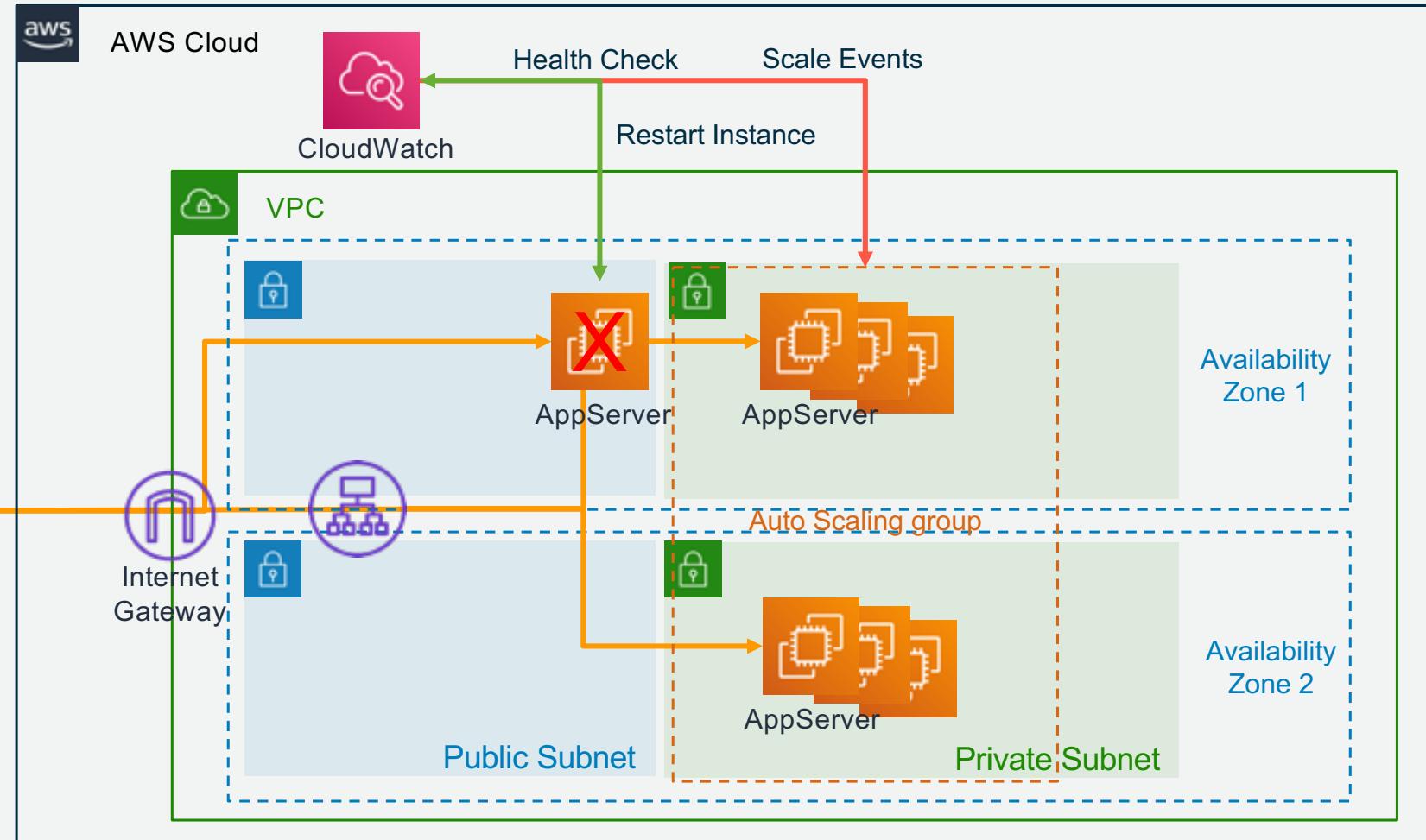
Managed and maintained by AWS Marketplace partners

Your machine images

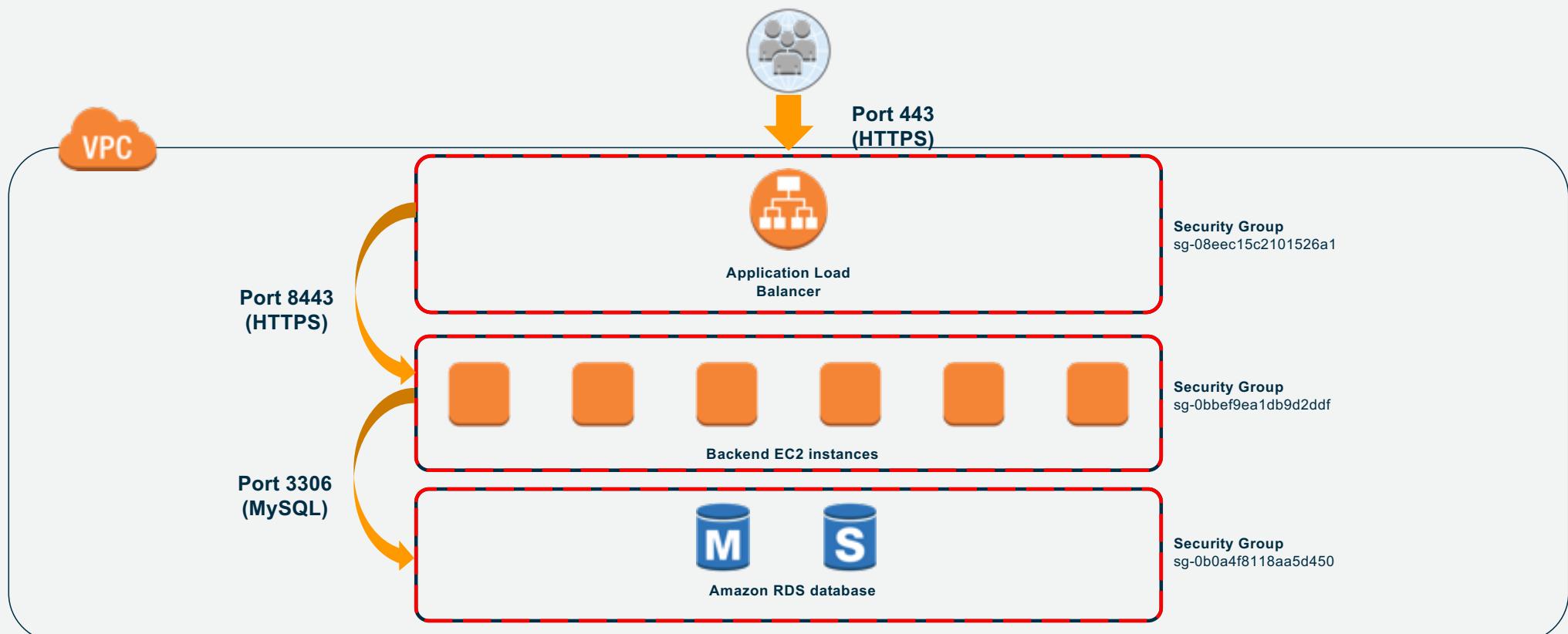
AMIs you have created from Amazon EC2 instances

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

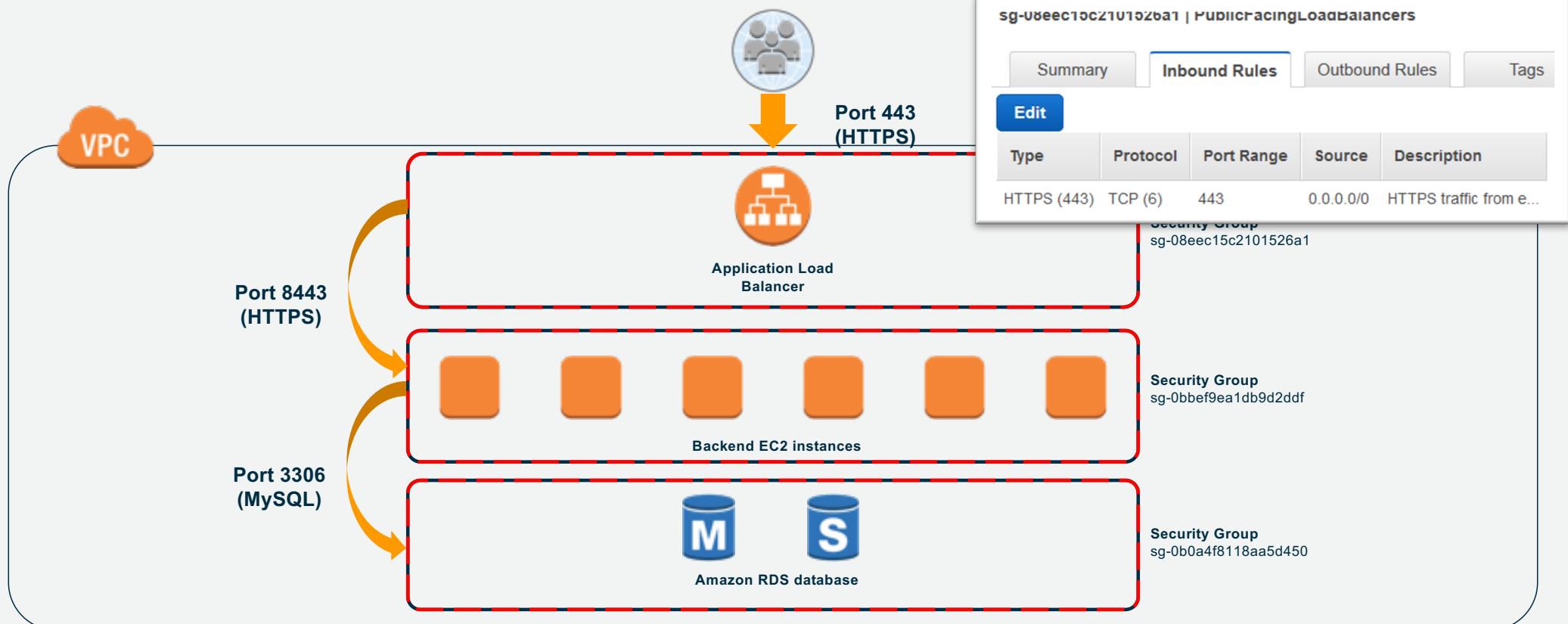
Grails App on AWS



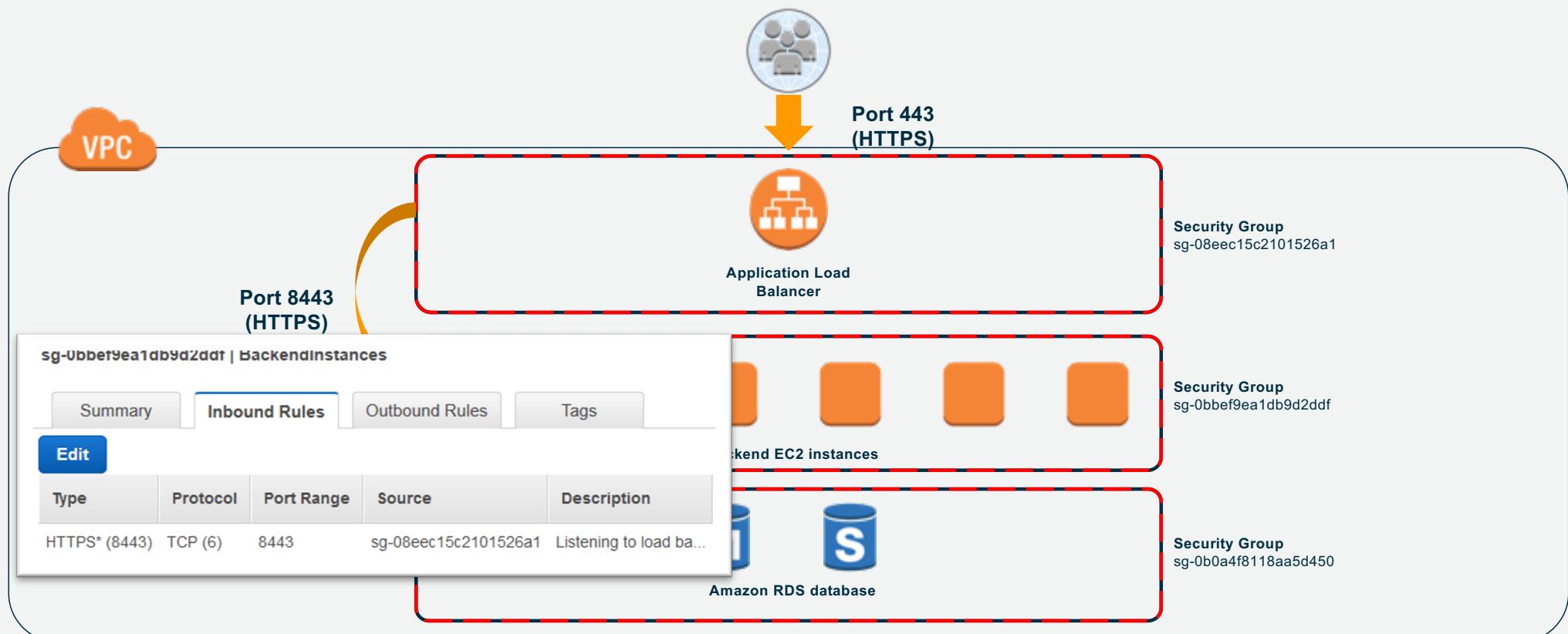
Security Groups: Stateful network firewalls



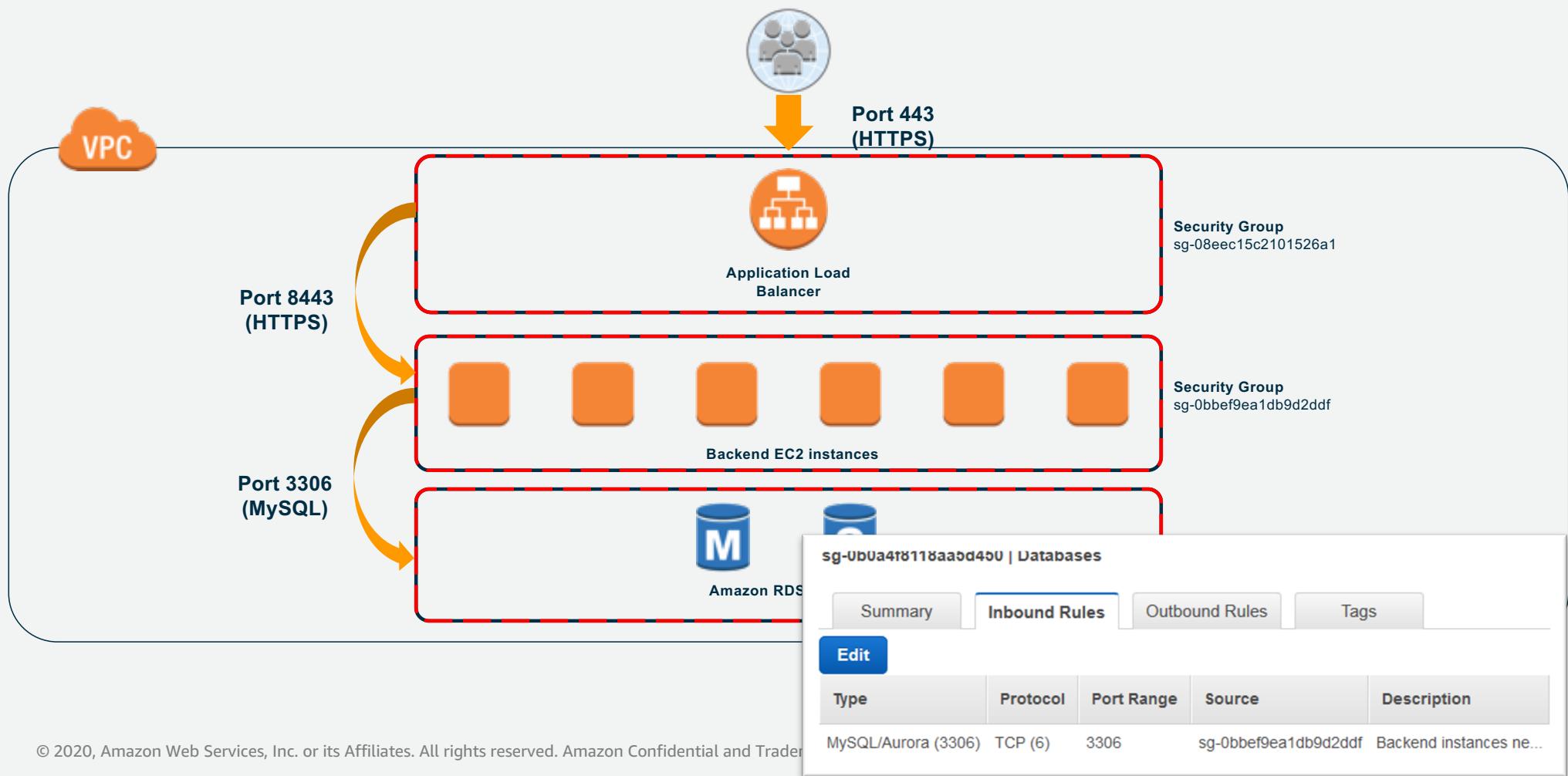
Security Groups: Stateful network firewalls



Security Groups: Stateful network firewalls



Security Groups: Stateful network firewalls

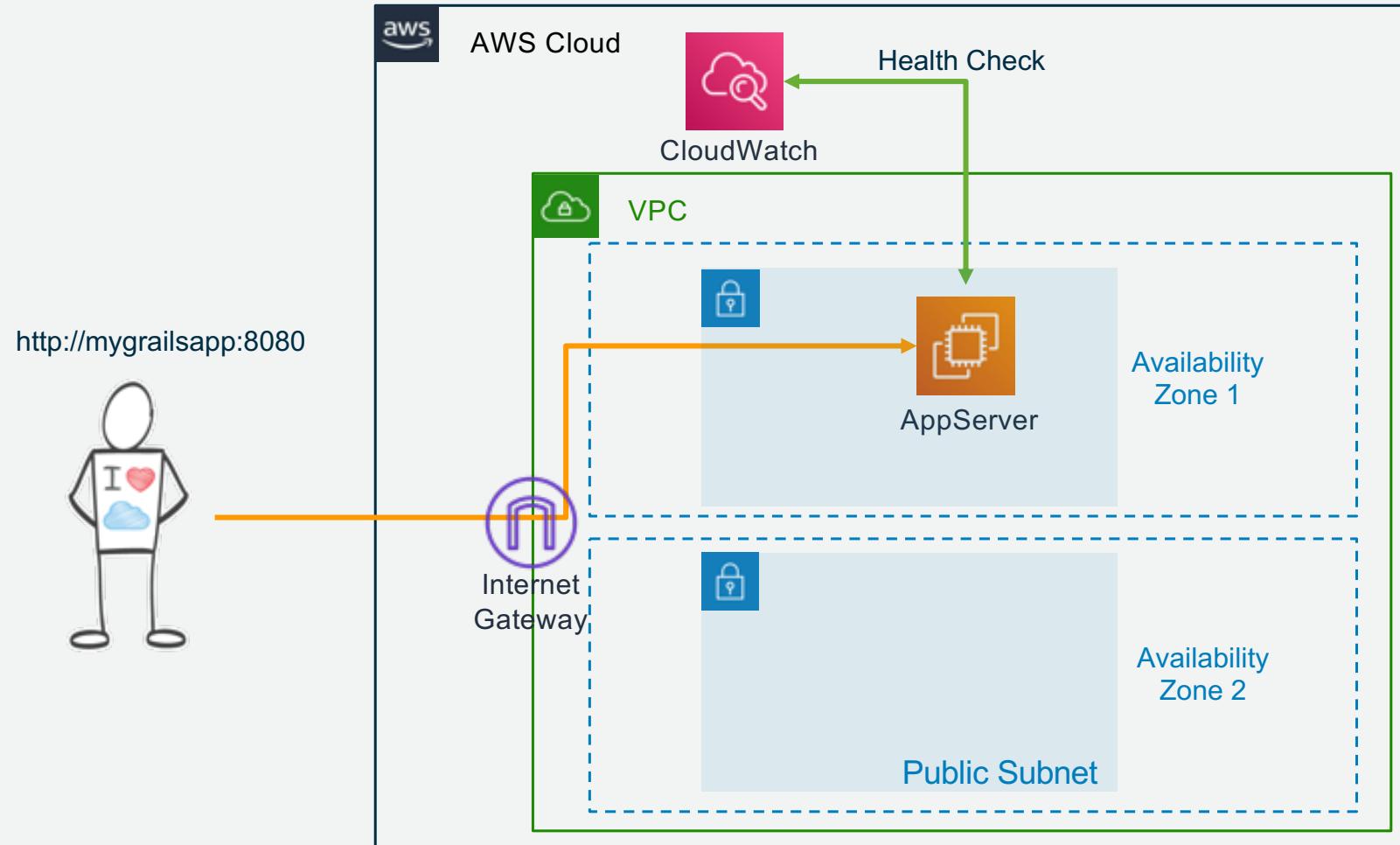


Hands-On Session

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Goal: Deploy your Grails Application on EC2



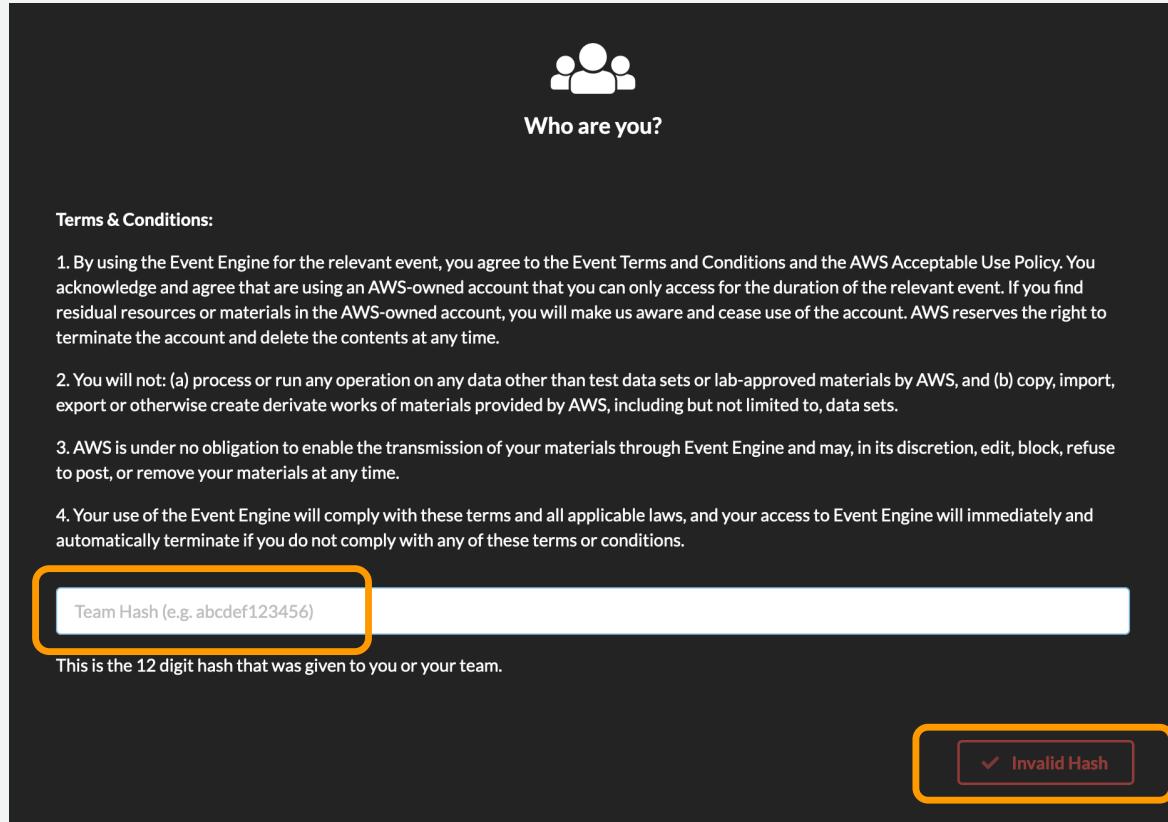
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Hands-On Session / Tasks

1. Login to Event Engine
2. Open AWS Console
3. Configure AWS Systems Manager / Quick Setup
4. Deploy EC2 Instance
5. Check EC2 Instance and test Grails App

Login to AWS Event Engine – <https://dashboard.eventengine.run>



Review Team Dashboard

Team Dashboard

 Event

 AWS Console  SSH Key

Event: FHNW Deployment workshop
Team Name: (Team Name Not Set Yet)

Event ID: 145230f44ba94cb2acf5ad3467a44634
Team ID: ccc3d1e57a084238af13d374887a55d5

Open AWS Console

AWS Console Login

Remember to only use "eu-central-1" as your region, unless otherwise directed by the event operator.

Login Link

 Open AWS Console  Copy Login Link

Credentials / CLI Snippets

Mac / Linux Windows

Mac or Linux 

```
export AWS_DEFAULT_REGION=eu-central-1
export AWS_ACCESS_KEY_ID=ASIA353V04HIWLEDLH3E
export AWS_SECRET_ACCESS_KEY=tmn84qqDRkGl1h0ElC3Rt+Y24WsSuEDvAeWeItXN
export AWS_SESSION_TOKEN=FwoGZXIvYXdzEOn//////////wEaDKYa1EvLlCOIVa0/ySKuAb3R+jSeR9P63M2TmqITHJDXo
```

How do I use the AWS CLI?

Checkout the AWS CLI documentation here: <https://docs.aws.amazon.com/cli/latest/userguide/cli-chap-welcome.html>

OK



Services ▾

Resource Groups ▾

CloudFormation

ECS

VPC

EC2



TeamRole/MasterKey @ 8200-...

Frankfurt ▾

Support ▾

AWS Management Console

AWS services

Find Services

You can enter names, keywords or acronyms.

 systems mana**Systems Manager**

AWS Systems Manager is a Central Place to View and Manage AWS Resources

[Systems Manager](#)

FSx

Fully managed third-party file systems optimized for a variety of workloads

[▶ All services](#)

Build a solution

Get started with simple wizards and automated workflows.

Launch a virtual machine

With EC2

2-3 minutes

**Build a web app**

With Elastic Beanstalk

6 minutes

**Build using virtual servers**

With Lightsail

1-2 minutes

**Register a domain**[View details](#)**Connect an IoT device**[View details](#)**Start migrating to AWS**[View details](#)

Access resources on the go



Access the Management Console using the AWS Console Mobile App. [Learn more](#)

Explore AWS

AWS Security Hub

Centrally view and manage security alerts and automate compliance checks. [Learn more](#)

AWS IQ

Connect with AWS Certified third-party experts for on-demand consultations and project help. [Get started](#)

Free Digital Training

Get access to 350+ self-paced online courses covering AWS products and services. [Learn more](#)

Amazon DynamoDB

Want more scale? Try a serverless NoSQL database service for your modern application. [Get started](#)



Services ▾

Resource Groups ▾

CloudFormation

ECS

VPC

EC2



TeamRole/MasterKey @ 8200-...

Frankfurt ▾

Support ▾

AWS Systems Manager X

[Quick Setup](#)

Operations Management

[Explorer New](#)[OpsCenter](#)[CloudWatch Dashboard](#)[Trusted Advisor & PHD](#)

Application Management

[Resource Groups](#)[AppConfig New](#)[Parameter Store](#)

Actions & Change

[Automation](#)[Change Calendar New](#)[Maintenance Windows](#)

Instances & Nodes

[Compliance](#)[Inventory](#)[Managed Instances](#)[Hybrid Activations](#)[Session Manager](#)[Run Command](#)

MANAGEMENT TOOLS

AWS Systems Manager

Gain Operational Insight and Take Action on AWS Resources.

[Get Started with Systems Manager](#)

View operational data for groups of resources, so you can quickly identify and act on any issues that might impact applications that use those resources.

How it works



Group your resources

Group your AWS resources and save them into resource groups



View insights

See relevant operational data and dashboards about your grouped resources



Take action

Mitigate issues by performing operations directly on groups

More resources

[Documentation](#)[API reference](#)[FAQs](#)



Services ▾

Resource Groups ▾

CloudFormation

ECS

VPC

EC2



TeamRole/MasterKey @ 8200-...

Frankfurt ▾

Support ▾

AWS Systems Manager X

[Quick Setup](#)

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Instances & Nodes

[Compliance](#)[Inventory](#)[Managed Instances](#)[Hybrid Activations](#)[Session Manager](#)[Run Command](#)[State Manager](#)[AWS Systems Manager](#) > Quick Setup

Systems Manager Quick Setup

Configure required security roles and commonly used Systems Manager capabilities.

Permissions (Required)

Use the following options to configure two roles that give Systems Manager permission to access your instances and run commands on them.

Instance profile role

Use the default role

Quick Setup creates a new instance profile that uses a secure IAM permissions policy. Quick Setup assigns the profile to the instances that you specify.

Choose an existing role

Uses an existing instance profile. The instance profile must contain the required permissions policy. Choose the instance profile from the following list.

Assume role for Systems Manager

Use the default role

Quick Setup creates a new assume role that enables Systems Manager to securely run commands on your instances.

Choose an existing role

Uses an existing service role. The role must contain the required permissions policy. Choose the role from the following list

Quick Setup options

Quick Setup configures the following Systems Manager components based on best practices. Select the check boxes for actions you want to schedule. [Learn more](#)

Systems Manager Quick Setup

Use Systems Manager Quick Setup to configure the following Systems Manager components.

Permissions (Required)

Systems Manager requires two roles that provide permission to access your instances and run commands on them. You can choose to have Quick Setup create these roles for you, or you can specify existing IAM roles. If you choose existing roles, those roles must contain the required permissions policy. [Learn more](#)

SSM Agent update

Update SSM Agent to the latest version every two weeks. [Learn more](#)

Inventory collection

Collect information about your instances, including metadata about installed applications, installed AWS components, and instance details such as operating system name and version, to name a few. [Learn more](#)

If Inventory is already configured for your instances, enabling it here can disrupt inventory collection. To find out if Inventory is already configured, view the Inventory page in the navigation pane under Instances & Nodes. For more information see [AWS Systems Manager Inventory](#).

Quick Setup options

Quick Setup configures the following Systems Manager components based on best practices. Select the check boxes for actions you want to schedule. [Learn more](#)

- Update Systems Manager (SSM) Agent every two weeks
- Collect inventory from your instances every 30 minutes
- Scan instances for missing patches daily
- Install and configure the CloudWatch agent
- Update the CloudWatch agent once every 30 days

Learn more about the metrics included in [the CloudWatch agent's basic configuration](#) and Amazon CloudWatch [pricing](#).

Targets

Targets are the Amazon EC2 instances to manage with Systems Manager.

Target selection method

- Choose all instances in the current AWS account and Region
- Specify instance tags
- Choose instances manually

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

The screenshot shows the AWS Management Console homepage. At the top, there is a navigation bar with the AWS logo, a "Services" dropdown, a "Resource Groups" dropdown, "CloudFormation", "ECS", "VPC", "EC2" (which is highlighted with a blue bar), a bell icon, and user information "TeamRole/MasterKey @ 8200... Frankfurt". Below the navigation bar, the title "AWS Management Console" is displayed. On the left, there is a sidebar titled "AWS services" with a "Find Services" search bar containing the text "EC2". A yellow box highlights the "EC2" search result, which is described as "Virtual Servers in the Cloud". Other services listed include "EC2 Image Builder", "AWS Compute Optimizer", "ECS", "EFS", "GuardDuty", and "Build a solution". To the right, there is a section titled "Access resources on the go" with a mobile phone icon and text about the AWS Console Mobile App. Below that is a "Explore AWS" section with links to "AWS Security Hub" and "Amazon Aurora Machine Learning".

Step 2: Launch a new EC2 instance

The screenshot shows the AWS EC2 console's 'Launch instance' page. At the top, there's a blue banner with the text: 'Welcome to the new EC2 console! We're redesigning the EC2 console to make it easier to use and improve performance. We'll release new screens periodically. We encourage you to try them and let us know what you think.' Below the banner, the main heading is 'Launch instance'. There are two prominent buttons: a large orange 'Launch instance' button and a smaller grey 'Launch instance from template' button. A note below the buttons states: 'Note: Your instances will launch in the Europe (Frankfurt) Region'. On the left side, a sidebar menu is visible with sections like 'INSTANCES', 'IMAGES', 'ELASTIC BLOCK STORE', and 'NETWORK & SECURITY'. On the right side, there's a 'Service health' section showing 'Region: Europe (Frankfurt)' and 'Status: This service is operating normally'. The bottom of the page has a copyright notice: '© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.'

New EC2 Experience
Tell us what you think

EC2 Dashboard New

Events

Tags

Reports

Limits

INSTANCES

- Instances
- Instance Types
- Launch Templates New
- Spot Requests
- Savings Plans
- Reserved Instances
- Dedicated Hosts
- Capacity Reservations

IMAGES

- AMIs
- Bundle Tasks

ELASTIC BLOCK STORE

- Volumes
- Snapshots
- Lifecycle Manager

NETWORK & SECURITY

- Security Groups
- Elastic IPs New
- Placement Groups

Welcome to the new EC2 console!

We're redesigning the EC2 console to make it easier to use and improve performance. We'll release new screens periodically. We encourage you to try them and let us know what you think.

Launch instance

Launch instance

Launch instance from template

Launch instance ▾

Note: Your instances will launch in the Europe (Frankfurt) Region

Launch instance

To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

Launch instance ▾

Note: Your instances will launch in the Europe (Frankfurt) Region

Service health

Service Health Dashboard

Region	Status
Europe (Frankfurt)	This service is operating normally

Documentation

All EC2 resources

Forums

Pricing

Contact us

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Step 3: Choose an Amazon Machine Image (AMI)

1. Choose AMI

2. Choose Instance Type

3. Configure Instance

4. Add Storage

5. Add Tags

6. Configure Security Group

7. Review

[Cancel and Exit](#)

Step 1: Choose an Amazon Machine Image (AMI)

An AMI is a template that contains the software configuration (operating system, application server, and applications) required to launch your instance. You can select an AMI provided by AWS, our user community, or the AWS Marketplace; or you can select one of your own AMIs.

Search for an AMI by entering a search term e.g. "Windows" X

Quick Start

◀ ▶ 1 to 40 of 40 AMIs

My AMIs



Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0d4c3eabb9e72650a (64-bit x86) / ami-04f770c0b56bdfb99 (64-bit Arm)

[Select](#)

AWS Marketplace

Amazon Linux

Free tier eligible

Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras.

64-bit (x86)

64-bit (Arm)

Community AMIs

Free tier only (i)



Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-010fae13a16763bb4

[Select](#)

64-bit (x86)

Amazon Linux

Free tier eligible

The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages.

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes



Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-0badcc5b522737046

[Select](#)

64-bit (x86)

Red Hat

Free tier eligible

Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type

Root device type: ebs Virtualization type: hvm ENA Enabled: Yes

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

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t2.2xlarge	8	32	EBS only	-	Moderate	Yes
<input type="checkbox"/>	General purpose	t3a.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.micro	2	1	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.small	2	2	EBS only	Yes	Up to 5 Gigabit	Yes
<input type="checkbox"/>	General purpose	t3a.medium	2	4	EBS only	Yes	Up to 5 Gigabit	Yes

Cancel

Previous

Review and Launch

Next: Configure Instance Details

Step 5: Select IAM role & enter the Bootstrap Information

Number of instances i Launch into Auto Scaling Group i

Purchasing option i Request Spot instances

Network i vpc-5331f539 (default) ↻ C Create new VPC

Subnet i No preference (default subnet in any Availability Zone) ↻ C Create new subnet

Auto-assign Public IP i Use subnet setting (Enable) ↻

Placement group i Add instance to placement group

Capacity Reservation i Open ↻ C Create new Capacity Reservation

IAM role i C Create new IAM role

- ✓ None
- AmazonSSMRoleForInstancesQuickSetup
- TeamRoleInstanceProfile
- Stop

Shutdown behavior i

Enable termination protection i Protect against accidental termination

Monitoring i Enable CloudWatch detailed monitoring
Additional charges apply.

Step 5: Select IAM role & enter the Bootstrap Information

Advanced Details

User data 

As text As file Input is already base64 encoded

```
# 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
./grails run-app
```

[Cancel](#)

[Previous](#)

[Review and Launch](#)

[Next: Add Storage](#)

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
./grails run-app
```

<https://immersionday.volkmmer.org/fhnw/index.html>

<https://bit.ly/2MpUSnV>

Step 6: Add a virtual harddisk

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-02e5ab6af75699409	8	General Purpose SSD (gp2)	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

Add New Volume

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Add Tags](#)

Step 7: Give your Instance a name

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 5: Add Tags

A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.

A copy of a tag can be applied to volumes, instances or both.

Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key	(128 characters maximum)	Value	(256 characters maximum)	Instances	Volumes	
Name		GrailsApp		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="button" value="X"/>

Add another tag (Up to 50 tags maximum)

Cancel **Previous** **Review and Launch** **Next: Configure Security Group**

Step 8: Configure ports allowed

Assign a security group: Create a new security group Select an existing security group

Security group name: GrailsApp

Description: GrailsApp

Type	Protocol	Port Range	Source	Description
Custom TCP	TCP	8080	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

Warning
You will not be able to connect to this instance as the AMI requires port(s) 22 to be open in order to have access. Your current security group doesn't have port(s) 22 open.

Warning
Rules with source of 0.0.0.0/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

Cancel **Previous** **Review and Launch**

Step 9: Review the settings in launch your instance

▼ AMI Details

[Edit AMI](#)**Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0d4c3eabb9e72650a****Free tier eligible**

Amazon Linux 2 comes with five years support. It provides Linux kernel 4.14 tuned for optimal performance on Amazon EC2, systemd 219, GCC 7.3, Glibc 2.26, Binutils 2.29.1, and the latest software packages through extras.

Root Device Type: ebs Virtualization type: hvm

▼ Instance Type

[Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.medium	Variable	2	4	EBS only	-	Low to Moderate

▼ Security Groups

[Edit security groups](#)

Security group name GrailsApp
Description GrailsApp

[Cancel](#)[Previous](#)[Launch](#)

Step 10: Create and download your key pair

Select an existing key pair or create a new key pair X

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

▼

I acknowledge that I will not be able to connect to this instance unless I already know the password built into this AMI.

[Cancel](#) Launch Instances

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

Launch Status

Your instances are now launching

The following instance launches have been initiated: [i-0f6b0b6d00e5d34f5](#) [View launch log](#)

Get notified of estimated charges

Create [billing alerts](#) to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

How to connect to your instances

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click [View Instances](#) to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. [Find out](#) how to connect to your instances.

▼ Here are some helpful resources to get you started

- [How to connect to your Linux instance](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: User Guide](#)
- [Amazon EC2: Discussion Forum](#)

While your instances are launching you can also

- [Create status check alarms](#) to be notified when these instances fail status checks. (Additional charges may apply)
- [Create and attach additional EBS volumes](#) (Additional charges may apply)
- [Manage security groups](#)

[View Instances](#)

Step 12: Explore the instance details

Instance: i-0f6b0b6d00e5d34f5 (GrailsApp) Public DNS: ec2-3-120-157-164.eu-central-1.compute.amazonaws.com



Description Status Checks Monitoring Tags

Instance ID	i-0f6b0b6d00e5d34f5
Instance state	running
Instance type	t2.medium
Elastic IPs	
Availability zone	eu-central-1b
Security groups	GrailsApp . view inbound rules . view outbound rules
Scheduled events	No scheduled events
AMI ID	amzn2-ami-hvm-2.0.20191116.0-x86_64-gp2 (ami-0d4c3eabb9e72650a)
Platform	-
IAM role	AmazonSSMRoleForInstancesQuickSetup
Key pair name	-
Owner	820048224721
Launch time	December 24, 2019 at 8:52:16 AM UTC+1 (less than one hour)
Termination protection	False
Lifecycle	normal
Monitoring	basic
Alarm status	<i>None</i>
Kernel ID	-
RAM disk ID	-

Public DNS (IPv4)	ec2-3-120-157-164.eu-central-1.compute.amazonaws.com
IPv4 Public IP	3.120.157.164
IPv6 IPs	-
Private DNS	ip-172-31-32-206.eu-central-1.compute.internal
Private IPs	172.31.32.206
Secondary private IPs	
VPC ID	vpc-5331f539
Subnet ID	subnet-af372dd2
Network interfaces	eth0
Source/dest. check	True
T2/T3 Unlimited	Disabled
EBS-optimized	False
Root device type	ebs
Root device	/dev/xvda
Block devices	/dev/xvda
Elastic Graphics ID	-
Capacity Reservation	-
Capacity Reservation Settings	Open

Copy to clipboard

Step 13: Connect to your instance

The screenshot shows the AWS EC2 Instances page. On the left, there's a sidebar with options like New EC2 Experience, EC2 Dashboard, Events, Tags, Reports, Limits, and INSTANCES. Under INSTANCES, the 'Instances' option is selected. The main area displays a table of instances, with one row selected for 'GrailsApp'. At the top, there are buttons for Launch Instance, Connect (which is highlighted with an orange box), and Actions. Below the table, a modal window titled 'Connect to your instance' is open. It shows three connection methods: A standalone SSH client, Session Manager (which is selected and highlighted with an orange box), and EC2 Instance Connect (browser-based SSH connection). The 'Session Manager usage' section lists several benefits. At the bottom of the modal are 'Close' and 'Connect' buttons, with 'Connect' also highlighted with an orange box.

New EC2 Experience
Tell us what you think

EC2 Dashboard [New](#)

Events

Tags

Reports

Limits

INSTANCES

Instances

Launch Instance [Connect](#) Actions

Instance State : Running [Add filter](#)

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS (IPv4)
GrailsApp	i-0f6b0b6d00e5d34f5	t2.medium	eu-central-1b	running	2/2 checks ...	None	ec2-3-120-157-164.eu...

Connect to your instance

Connection method

A standalone SSH client [i](#)

Session Manager [i](#)

EC2 Instance Connect (browser-based SSH connection) [i](#)

Session Manager usage

- Connect to your instance without SSH keys or a bastion host.
- Sessions are secured using an AWS Key Management Service key.
- You can log session commands and details in an Amazon S3 bucket or CloudWatch Logs log group.
- Configure sessions on the Session Manager [Preferences](#) page.

To learn more, see [Getting Started with Session Manager](#).

Close [Connect](#)

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Step 14: Explore the VM directories, log files

Session ID: MasterKey-04b29f7ac4f00fa37

Instance ID: i-0f6b0b6d00e5d34f5

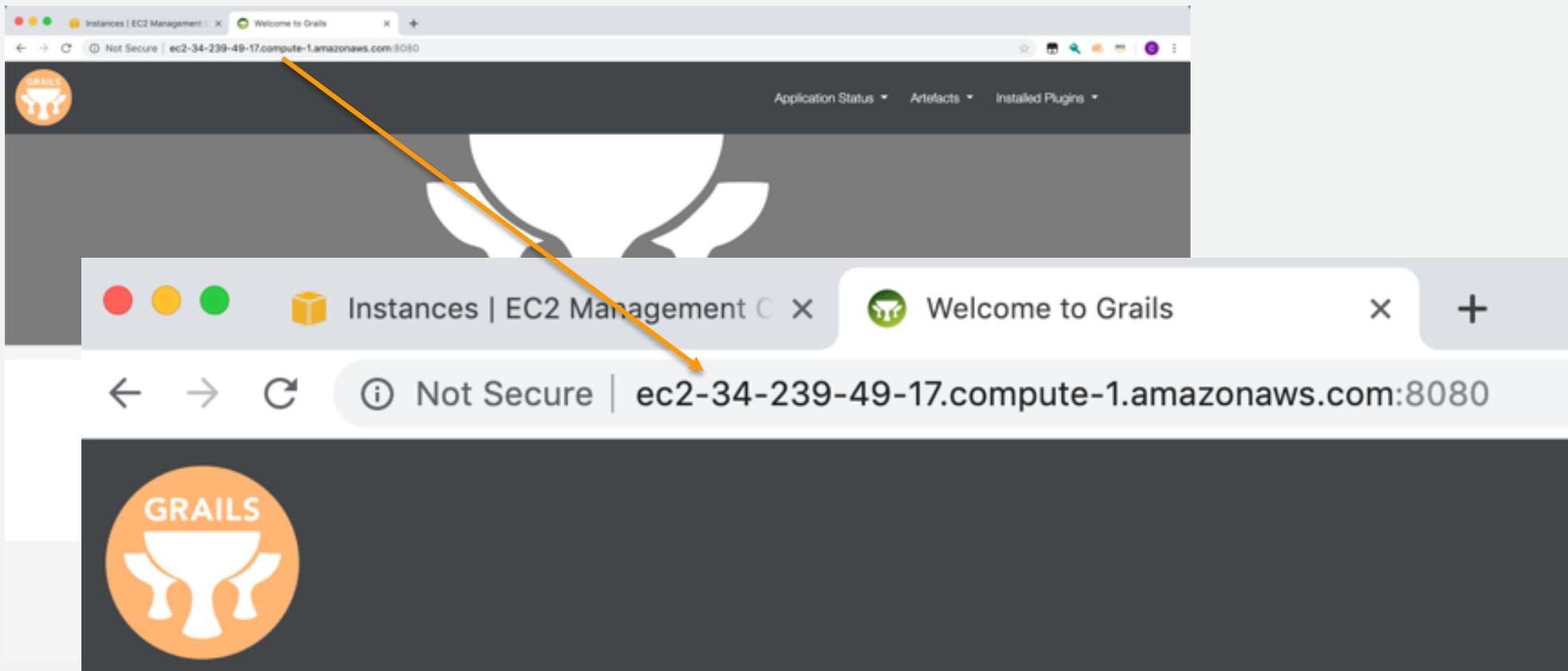
Terminate

sh-4.2\$ bash

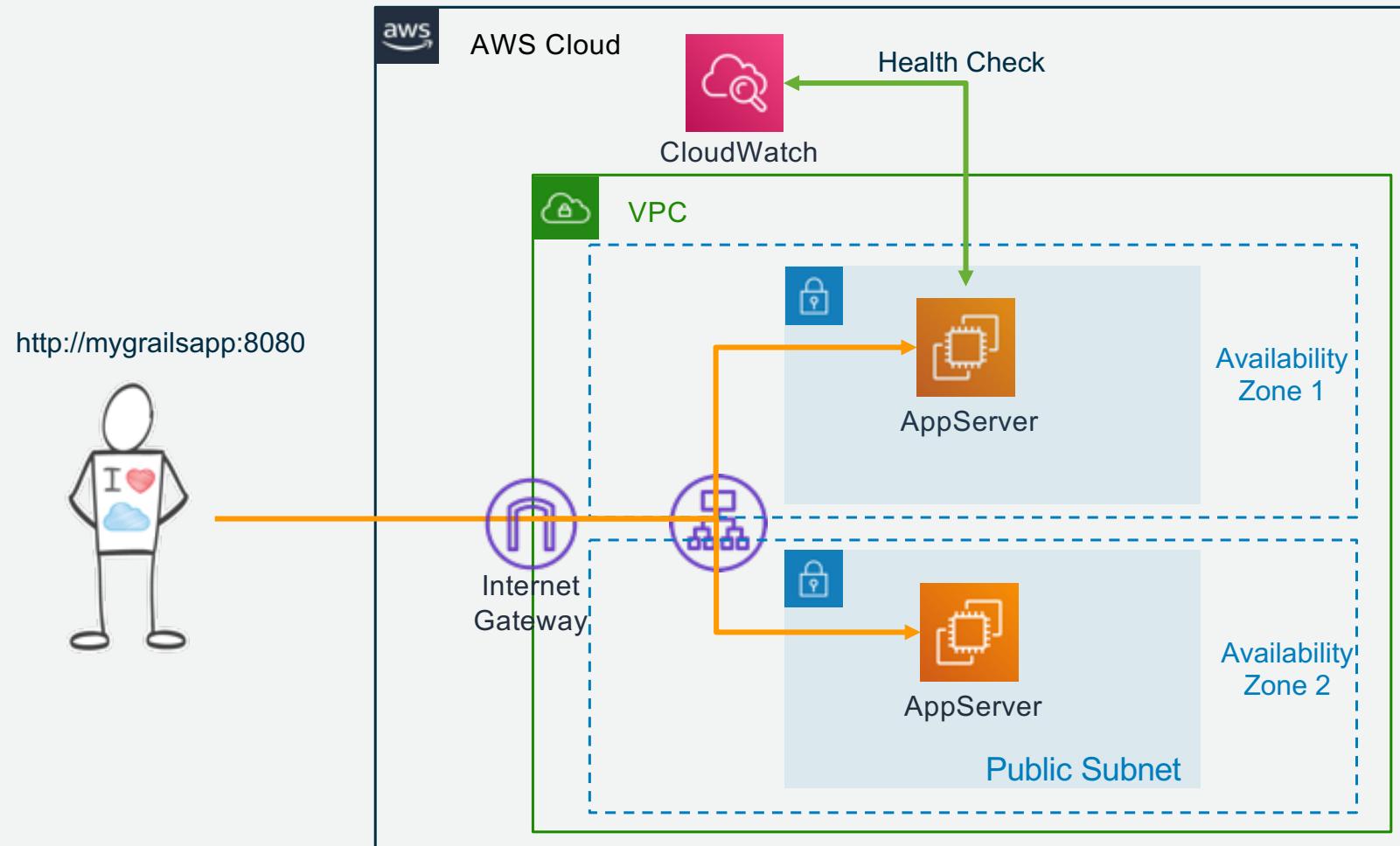
```
> bash  
> cd /  
> sudo su  
> cd /home/ec2-user/  
> ls -lsa  
> ps -ef | grep java  
> netstat -anltp | grep "LISTEN"
```

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

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



Add a Load Balancer to your Architecture



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Develop and Deploy

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AWS CloudFormation at a glance

Enables provisioning and management of your infrastructure as code



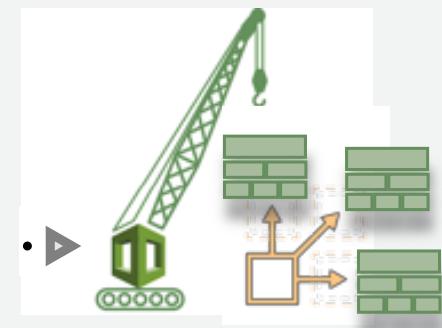
Code in YAML or JSON directly or use sample templates



Upload local files or from an S3 bucket



Create stack using console, API, or CLI



Stacks and resources are provisioned

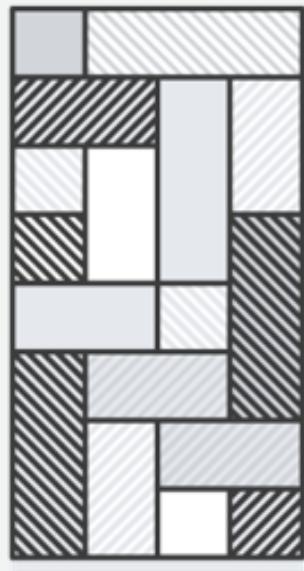
CloudFormation Demo

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Development transformation at Amazon: 2001-2009

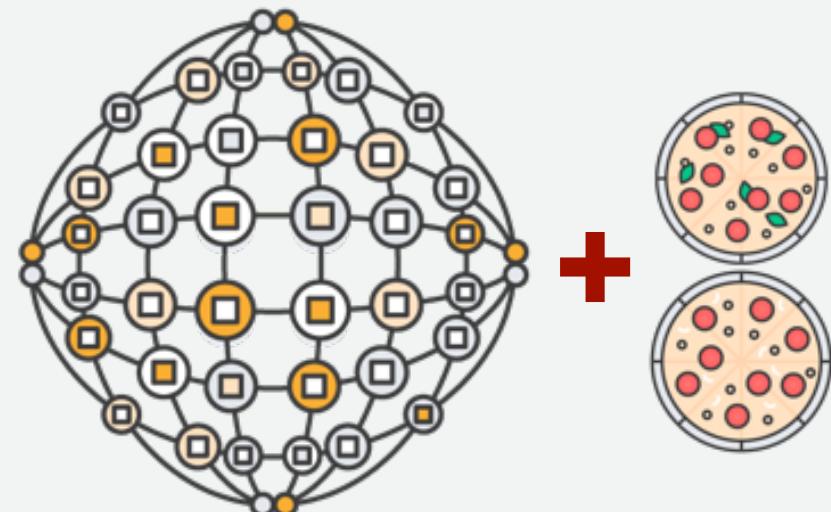
2001



monolithic
application + teams



2009



microservices + 2 pizza teams

AWS Elastic Beanstalk



AWS Elastic
Beanstalk

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

Completely transparent—you can see everything that is created

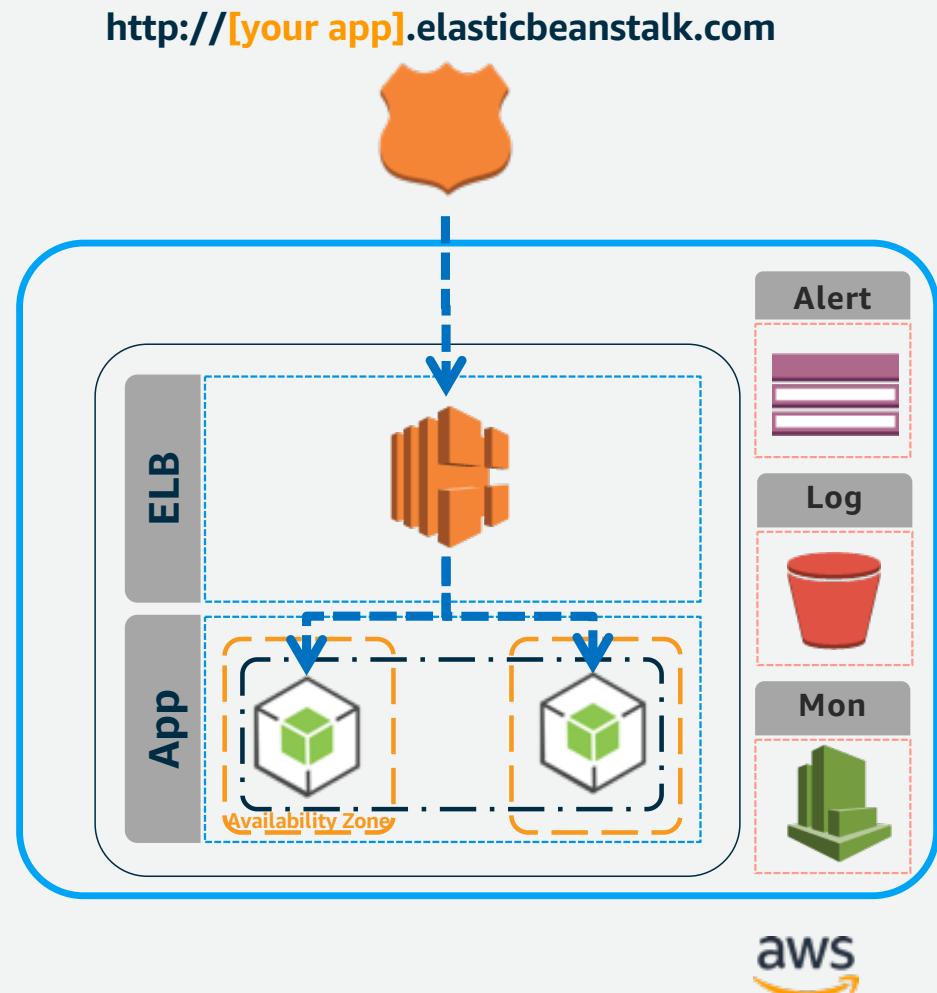
Impossible to outgrow; **automatically scales your application** up and down

High-Level Architecture

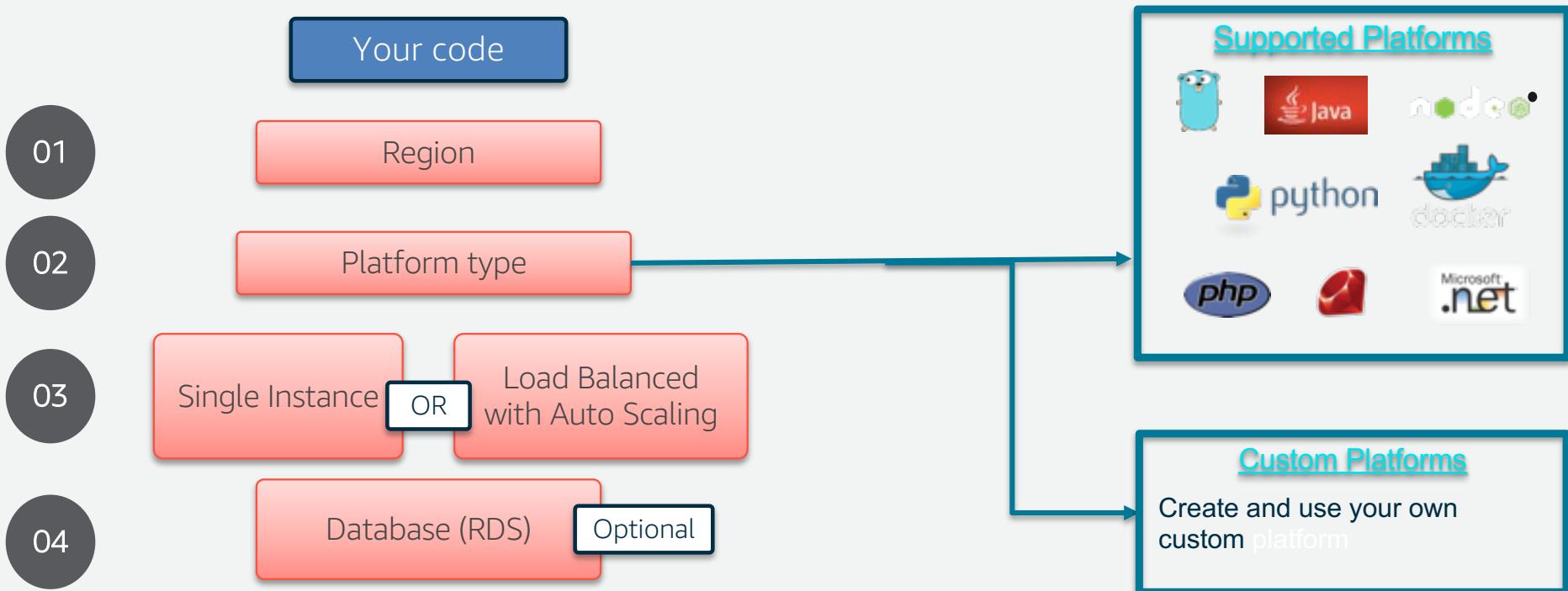
Elastic Beanstalk provisions necessary infrastructure resources

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

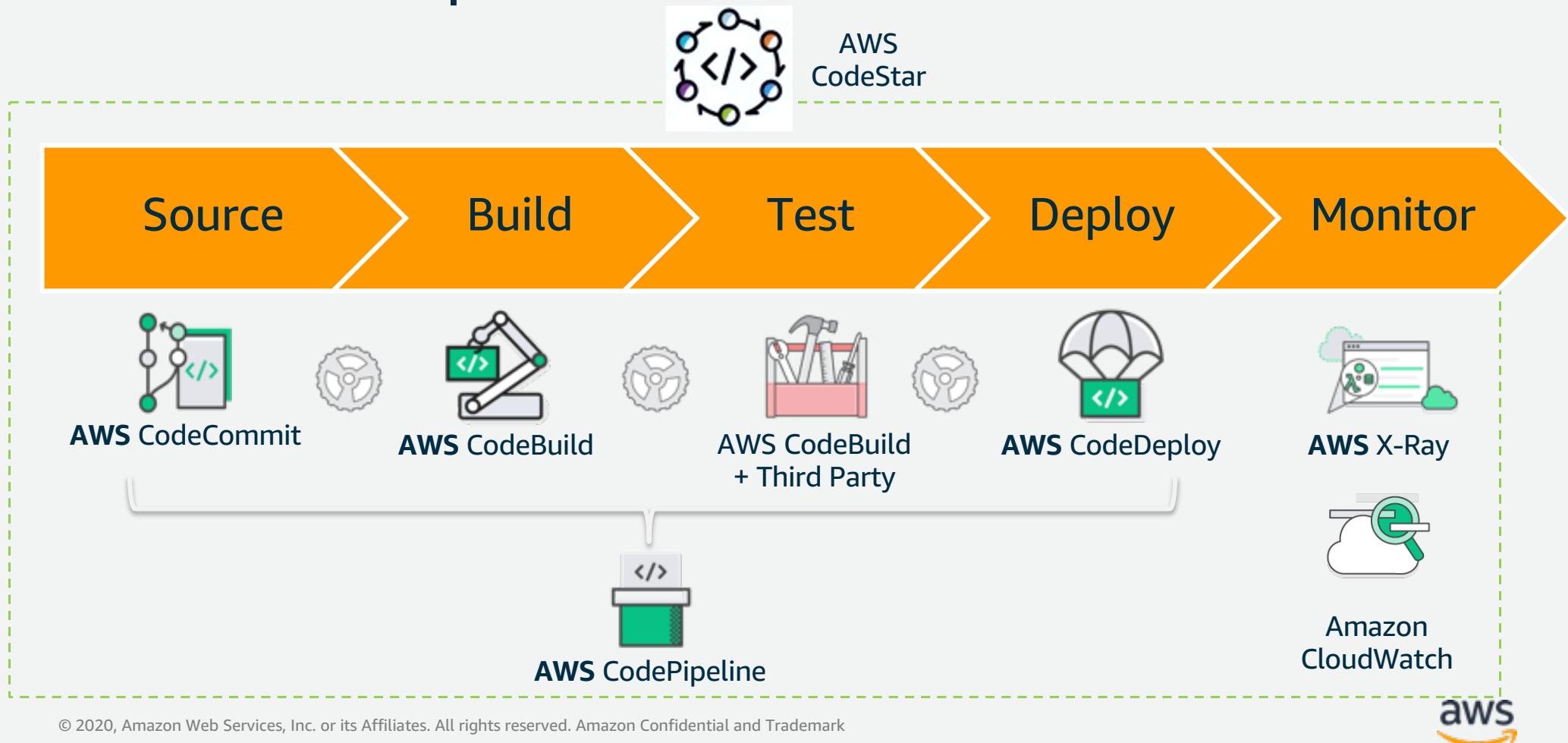


How to deploy an application



AWS Code Services

Software release steps



Code* Demo

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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>