



AWS Introduction

Building / Deploying Applications in the Cloud

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04.06.2019

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

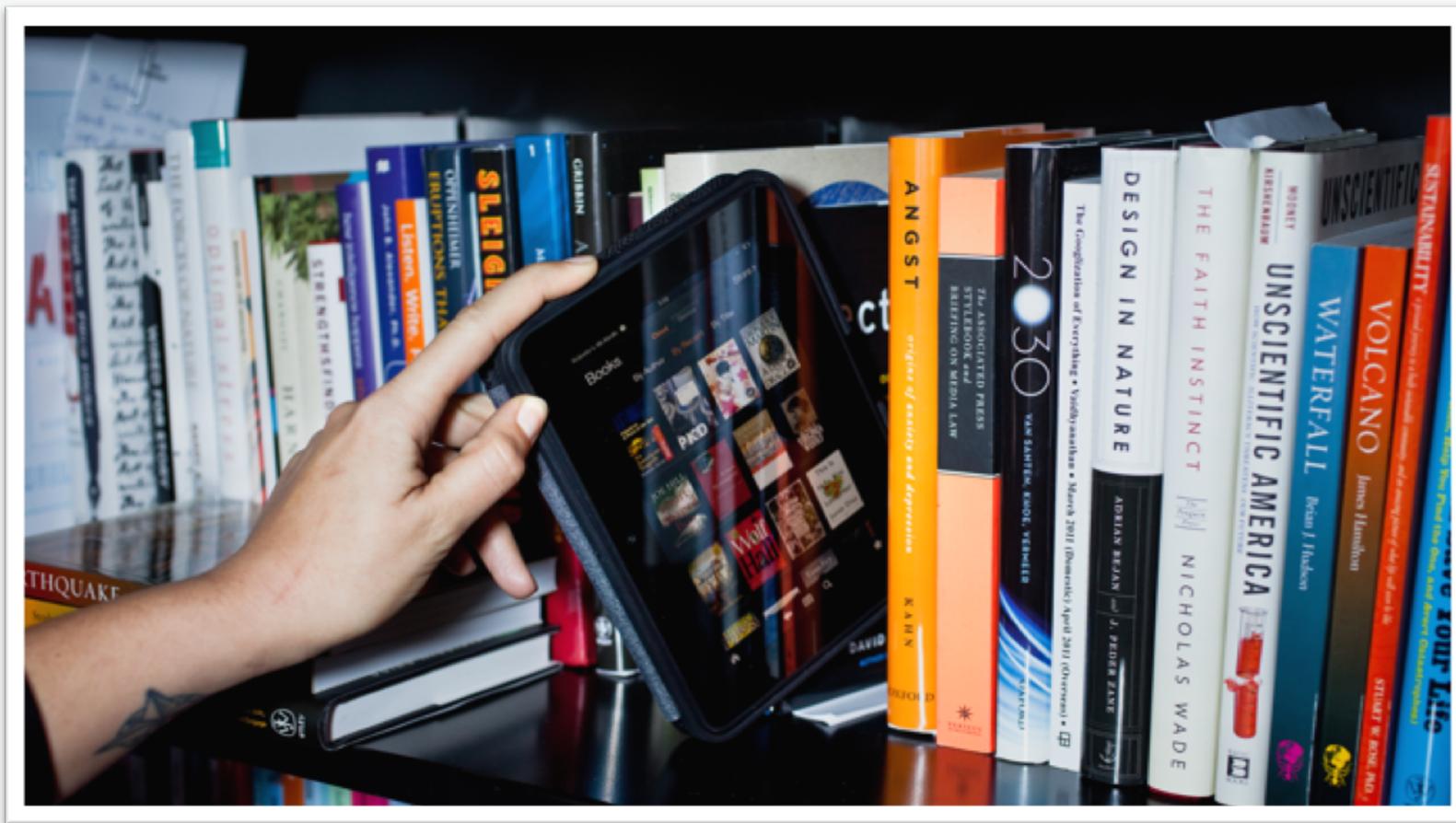
13:10 - 14:10h Hands-On Lab

Pause 14:10 - 14:20h

14:20 - 15:00h Theorie Teil 2

- Automation
- Development Tools

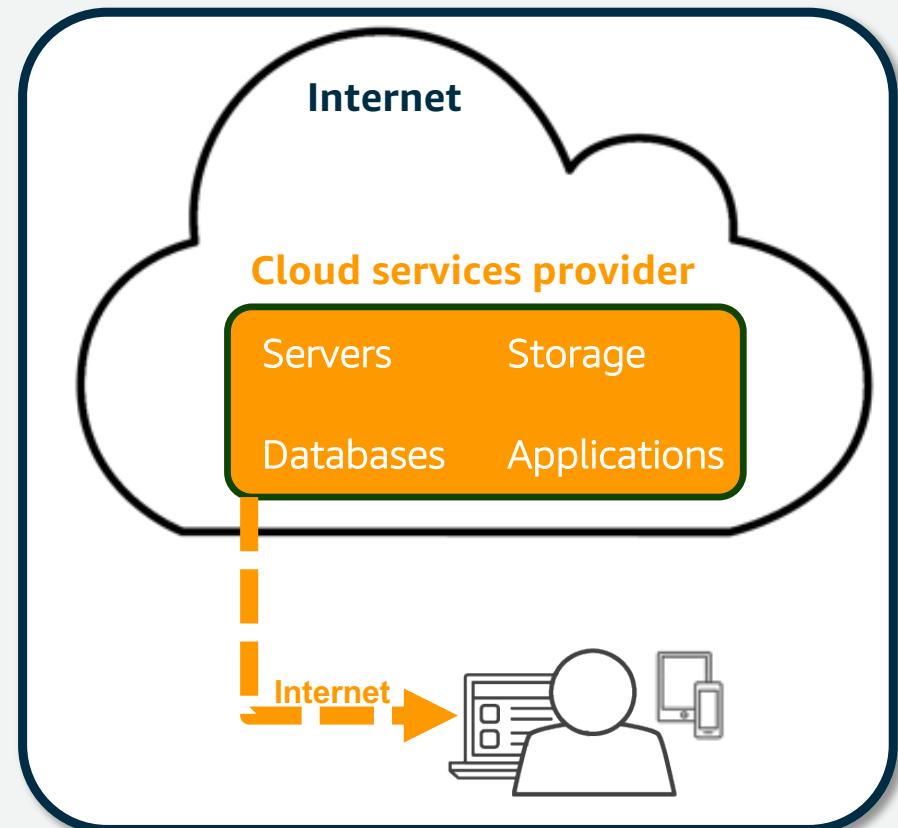
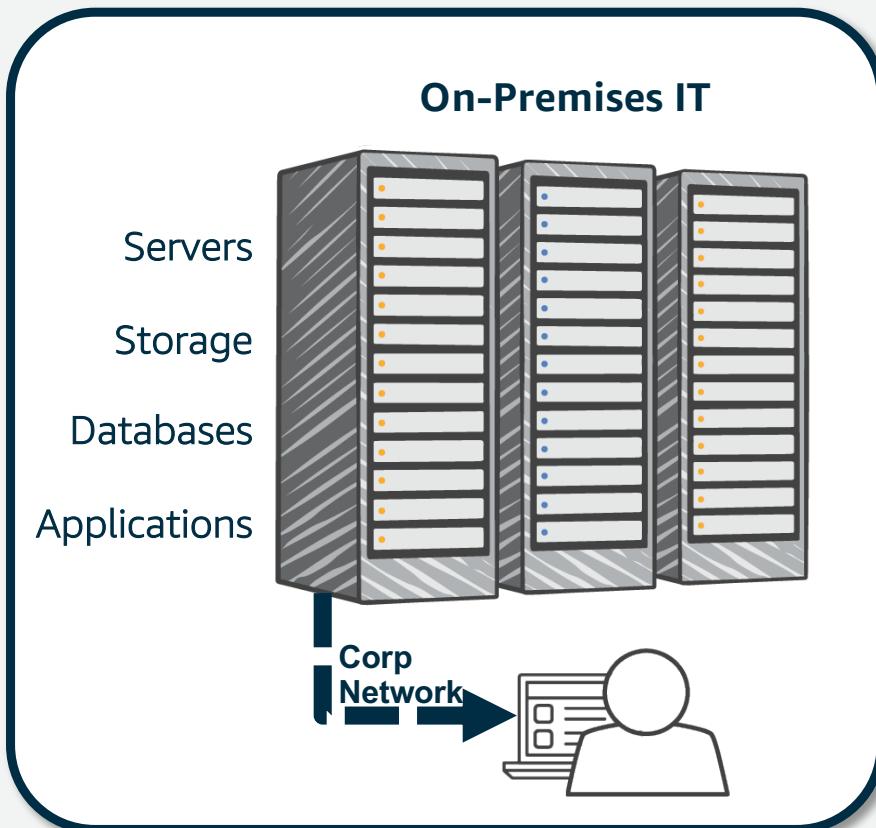
In 1994 Amazon Started with Books...



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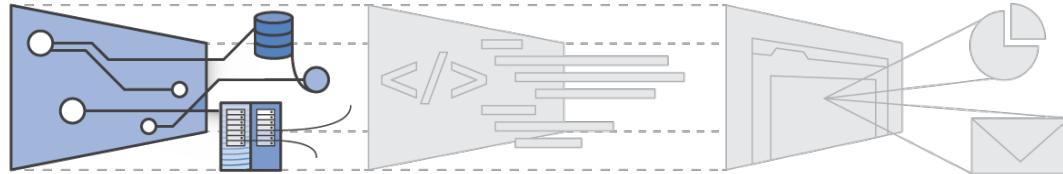


What is Cloud Computing?

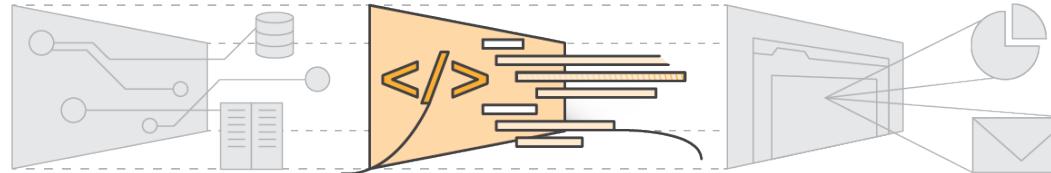


Cloud Computing Models

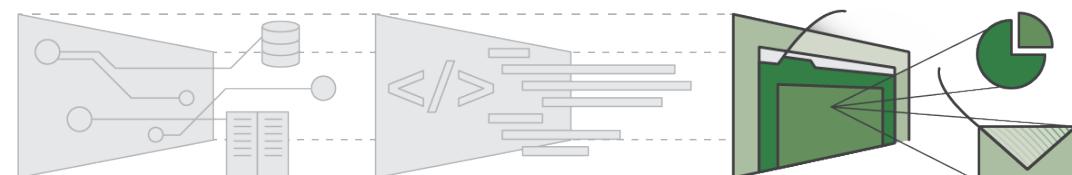
Infrastructure as a Service (IaaS)



Platform as a Service (PaaS)



Software as a Service (SaaS):



AWS Global Infrastructure

21 regions, 66 availability zones, 169 points of presence



● Regions

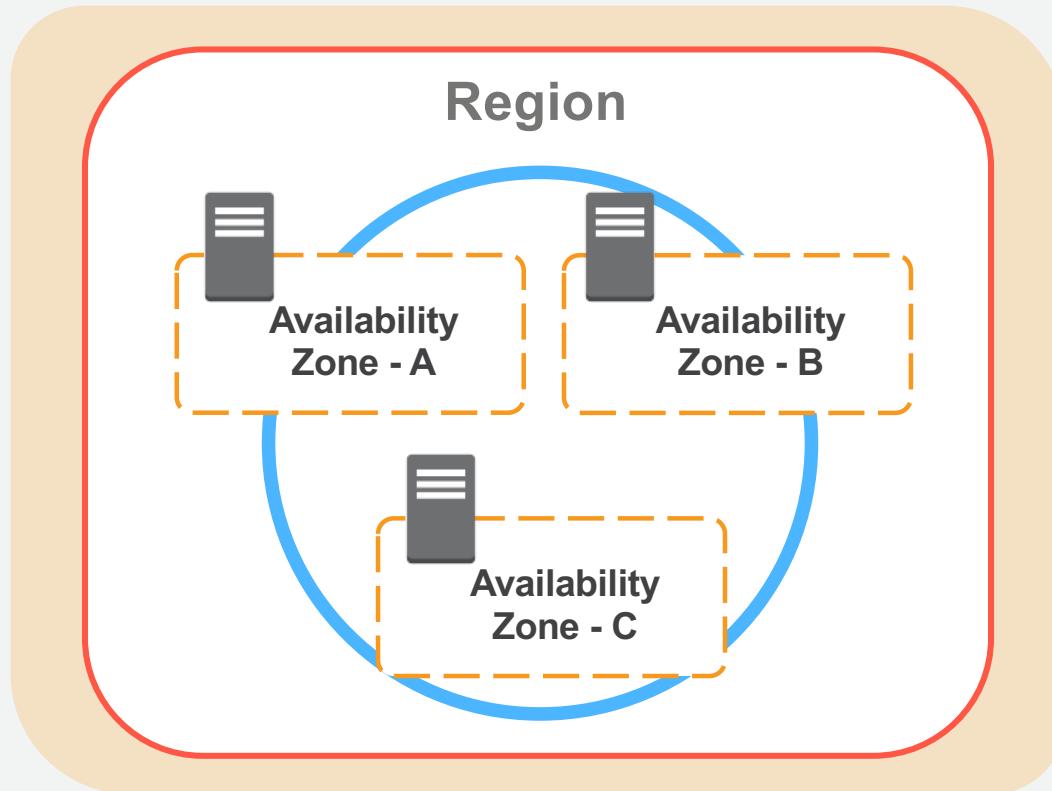
● Coming Soon Bahrain, Indonesia, Italy, South Africa

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

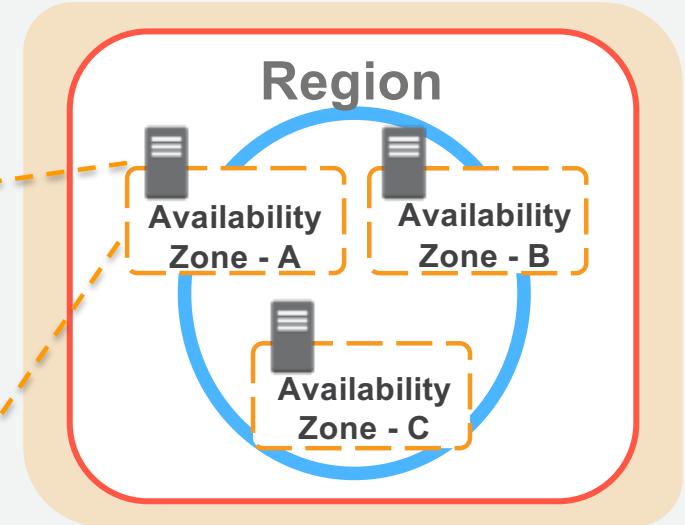
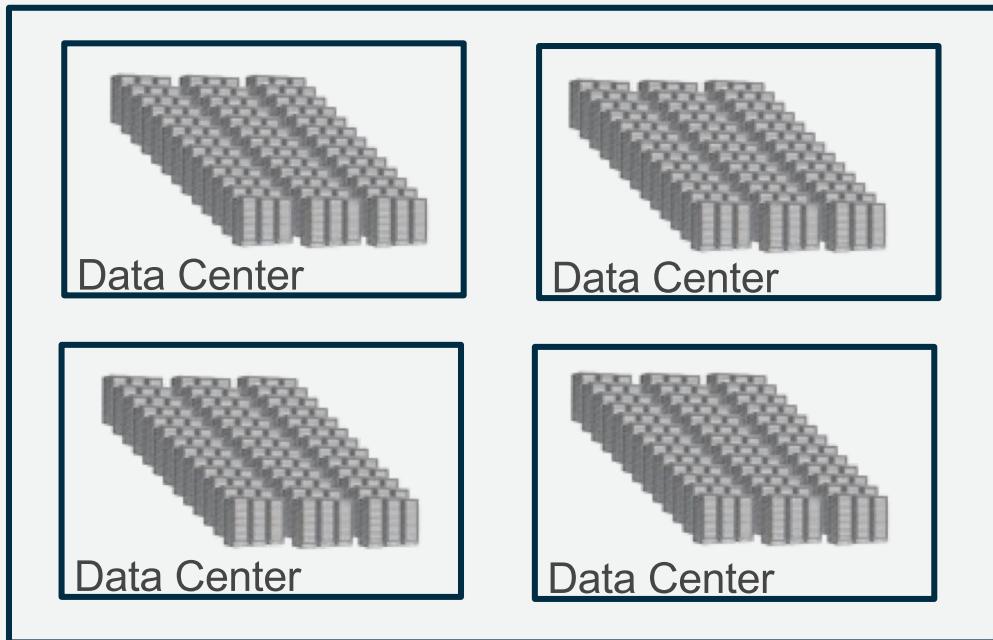
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Ensuring High Availability



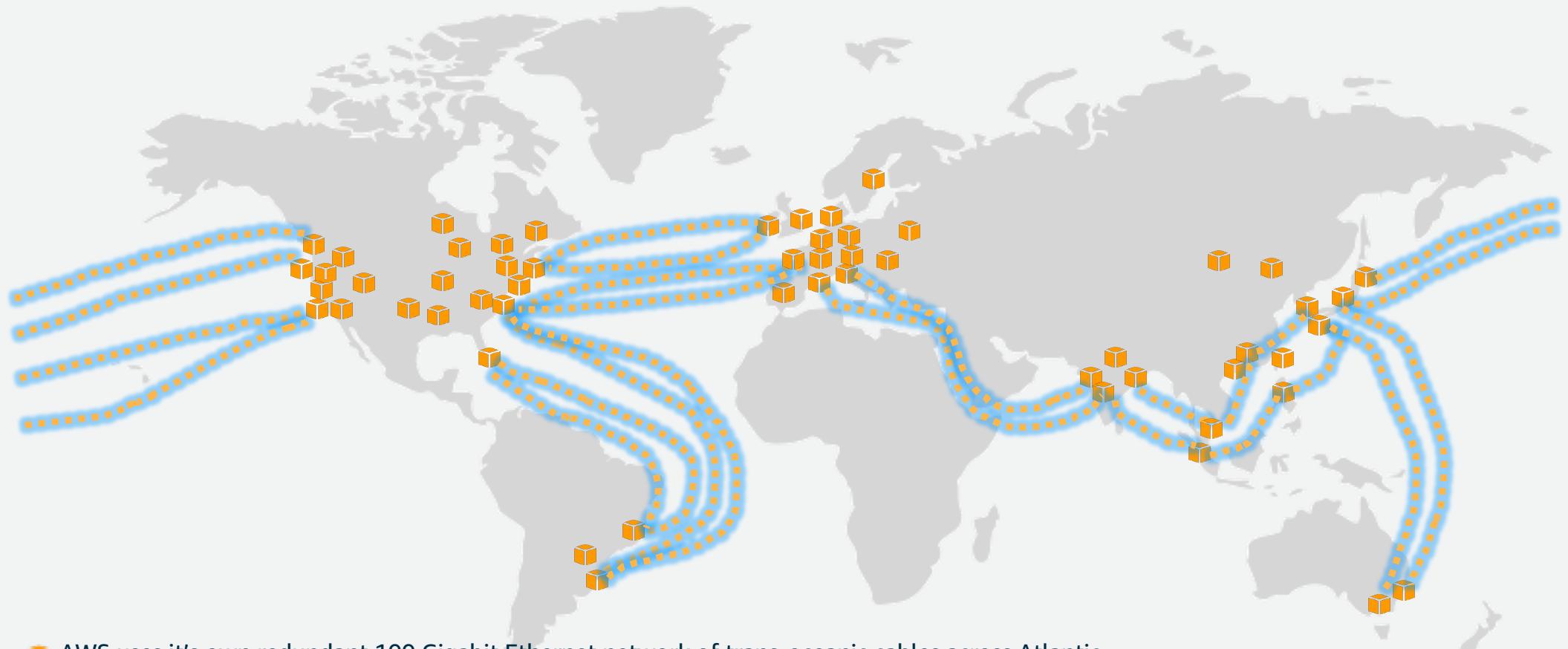
Example AWS Availability Zone



- 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

Customer

Responsible for security
IN the cloud

- Customer Data
- Platform, Applications, Identity & Access Management
- Operating System, Network & Firewall Configuration
- Client-side Data Encryption & Data Integrity Authentication
- Server-side Encryption (File System and/or Data)
- Network Traffic Protection (Encryption, Integrity, and/or Identity)

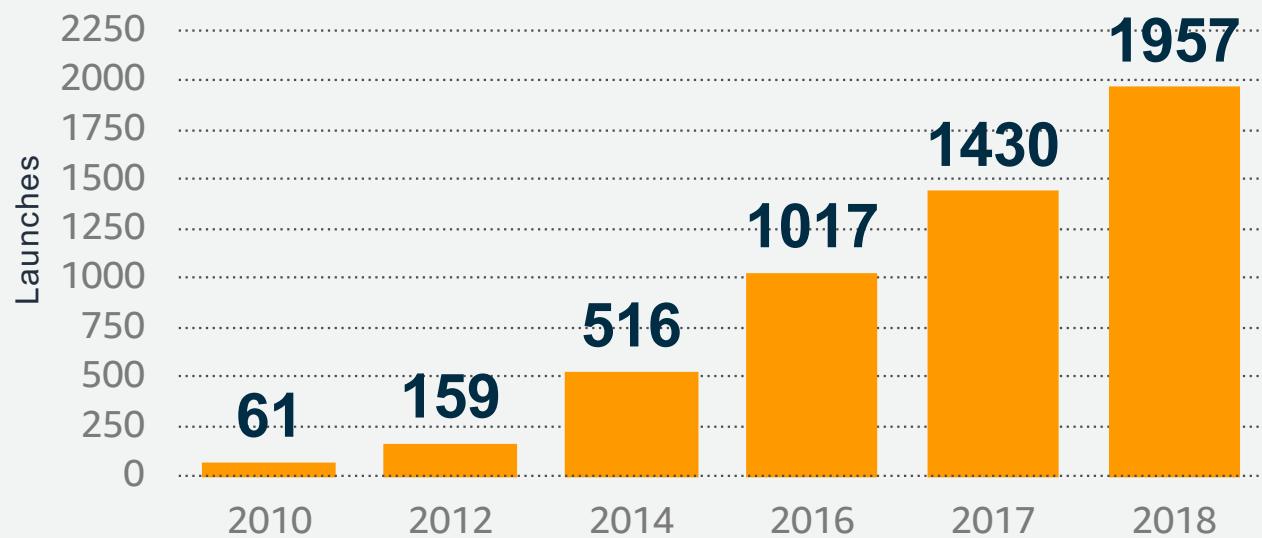
AWS

Responsible for security
OF the cloud

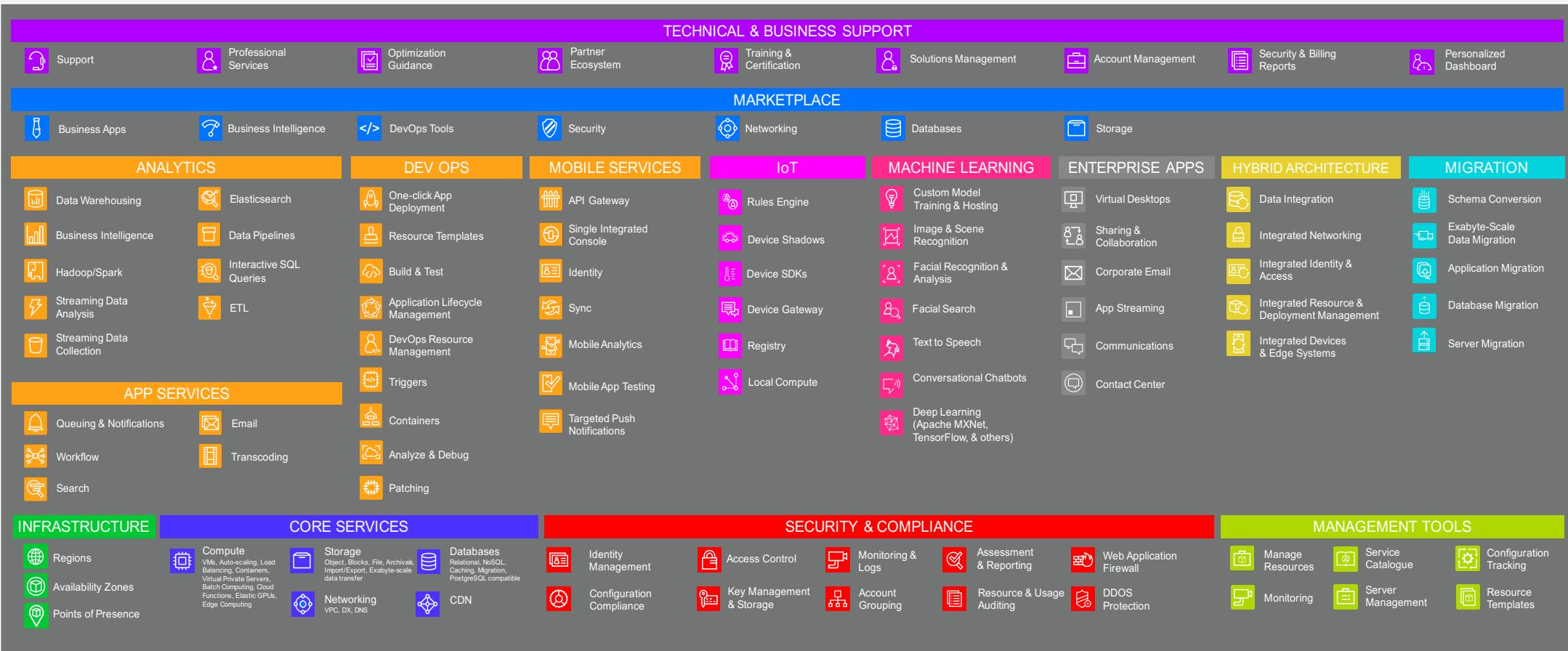
- Compute
- Storage
- Database
- Networking
- AWS Global Infrastructure
- Regions
- Availability Zones
- Edge Locations

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.



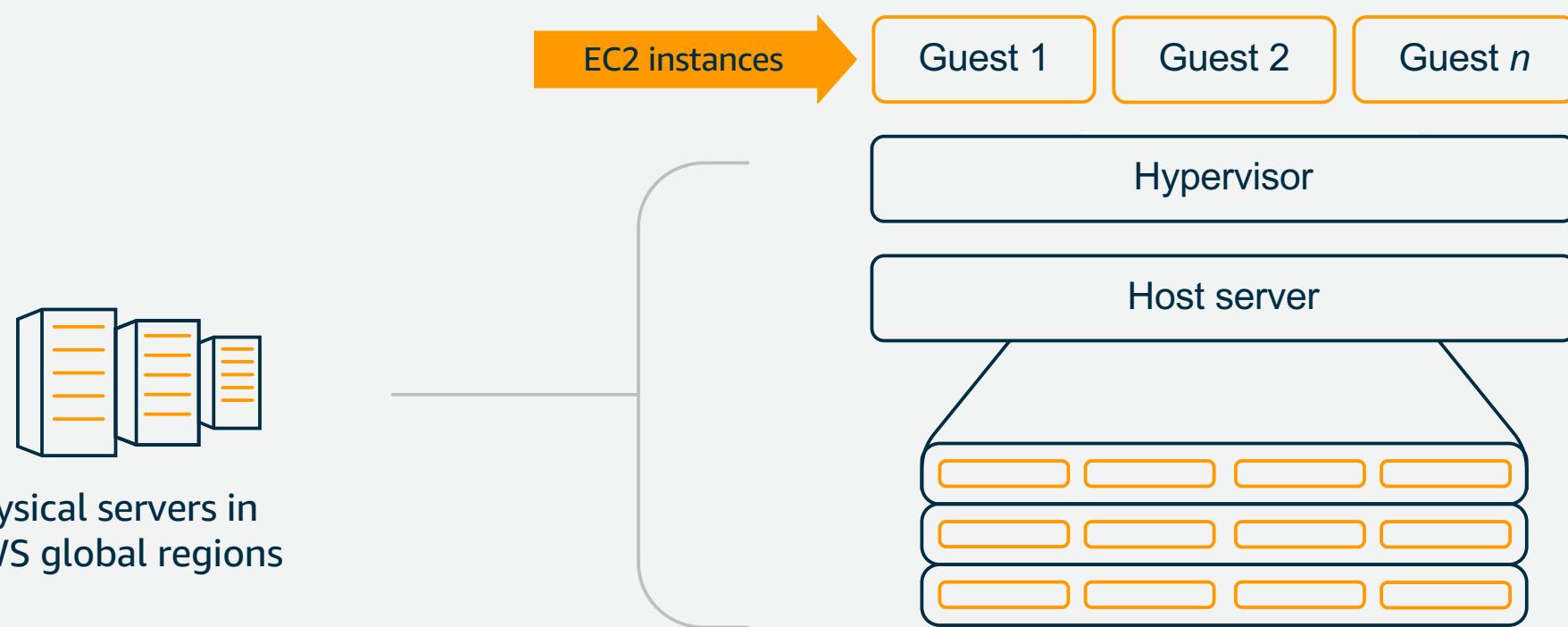
The AWS Platform



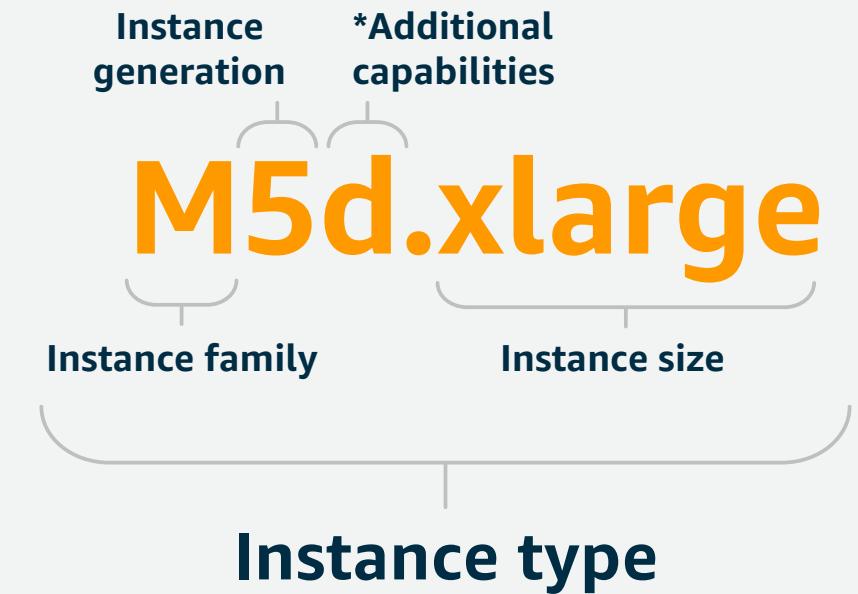
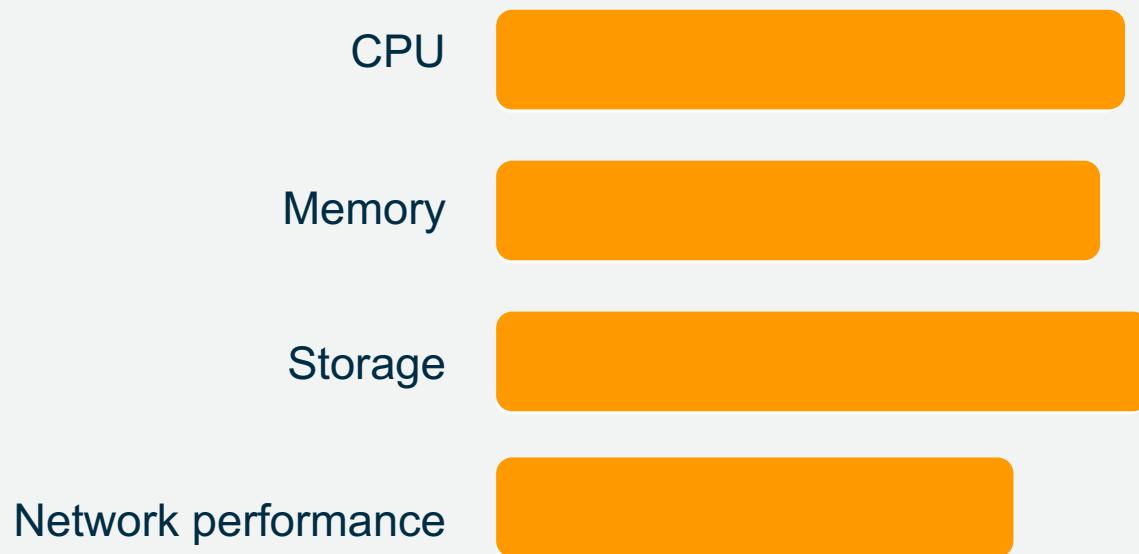


Amazon Elastic Compute Cloud (EC2)

Virtual servers in the cloud

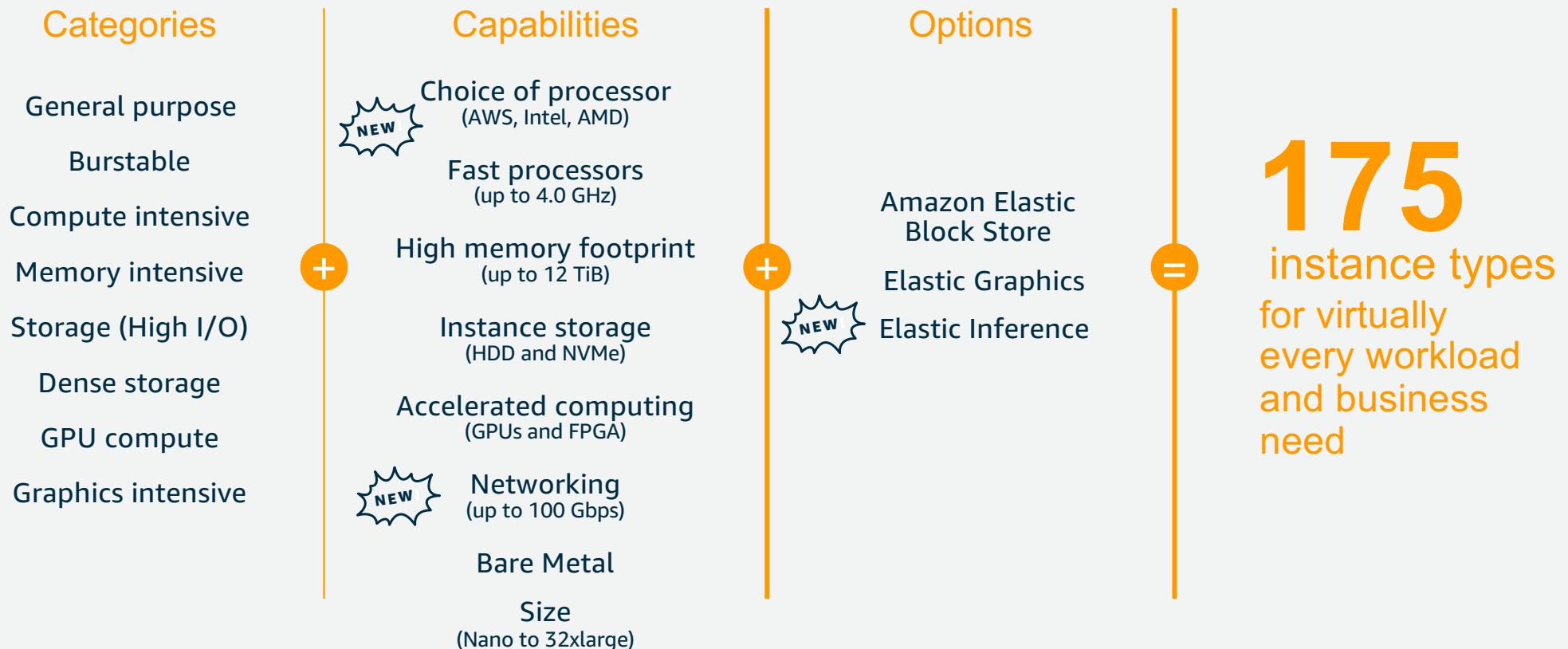


Amazon EC2 instance characteristics



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

Broadest and deepest platform choice



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

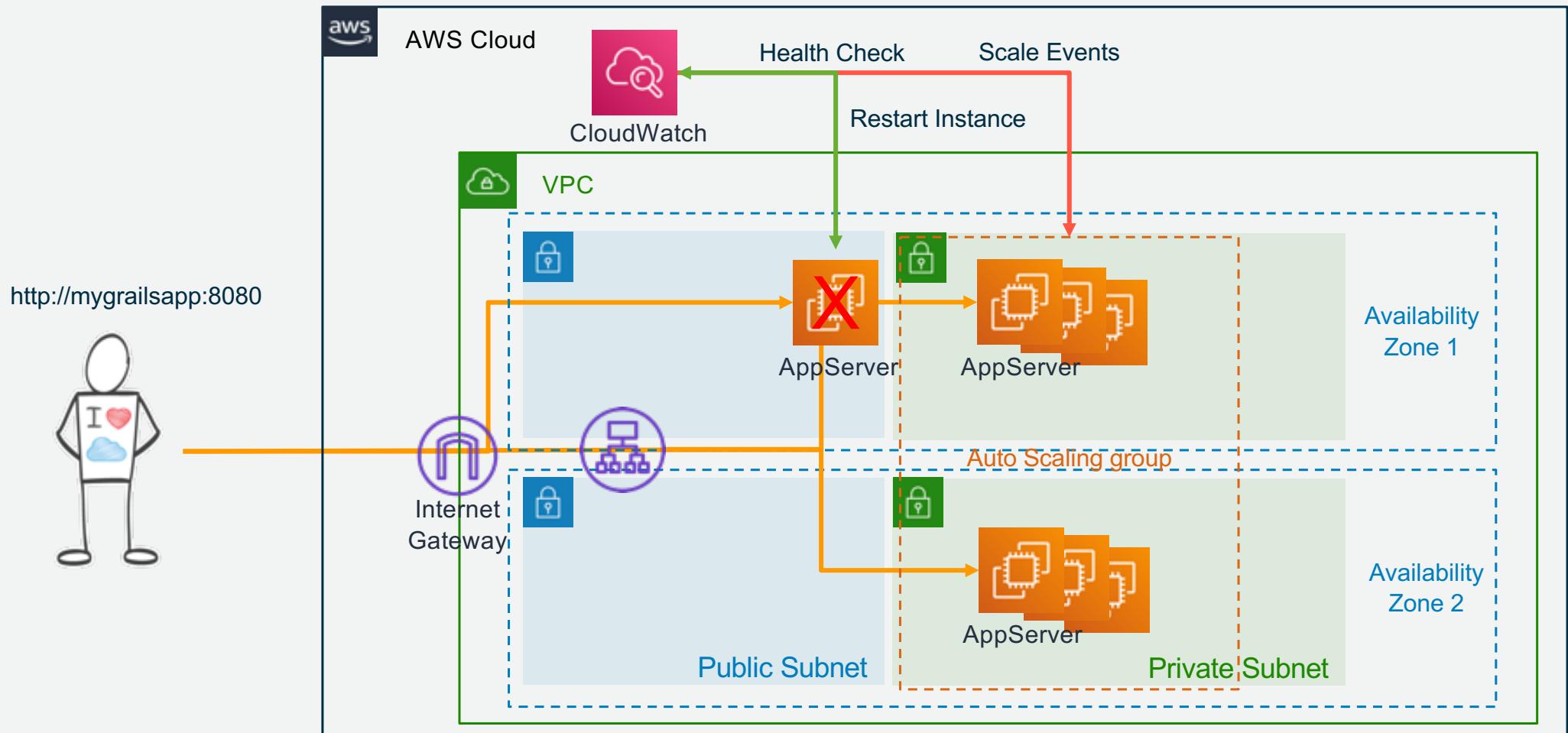
Managed and maintained by AWS Marketplace partners

Your machine images

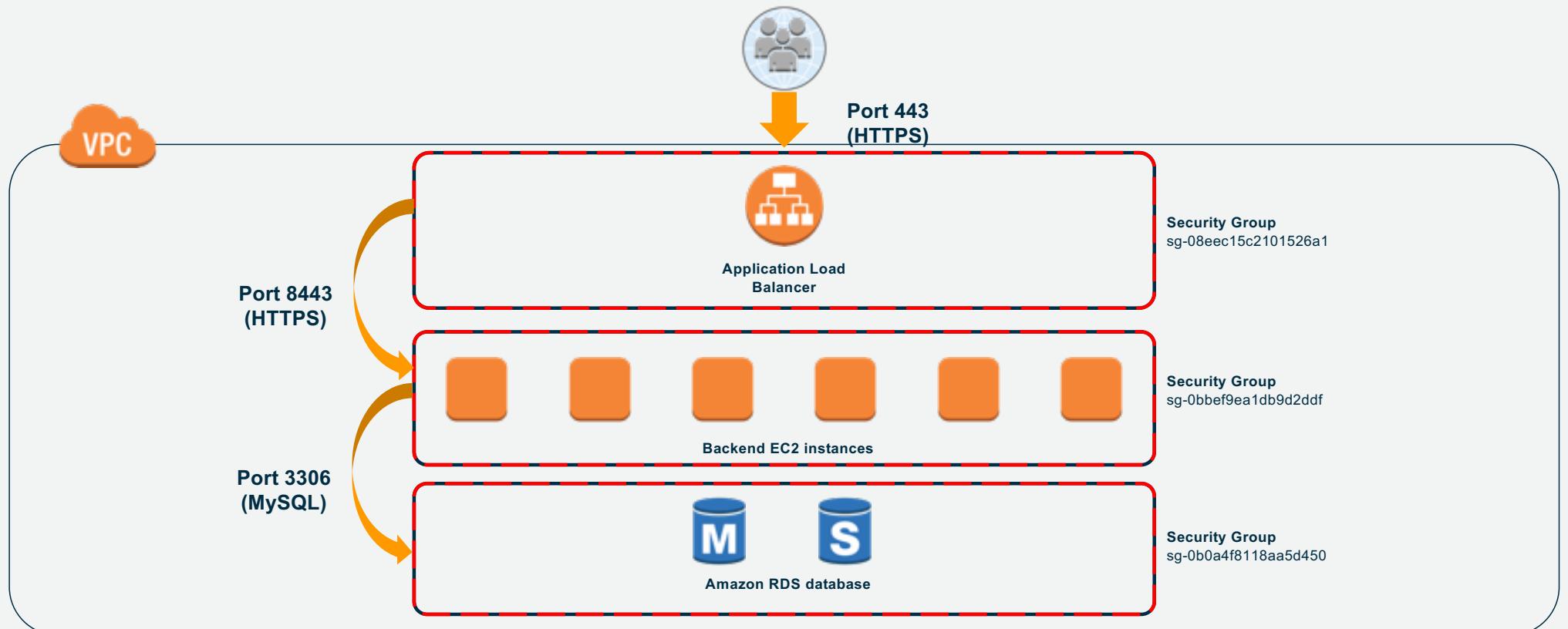
AMIs you have created from Amazon EC2 instances

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

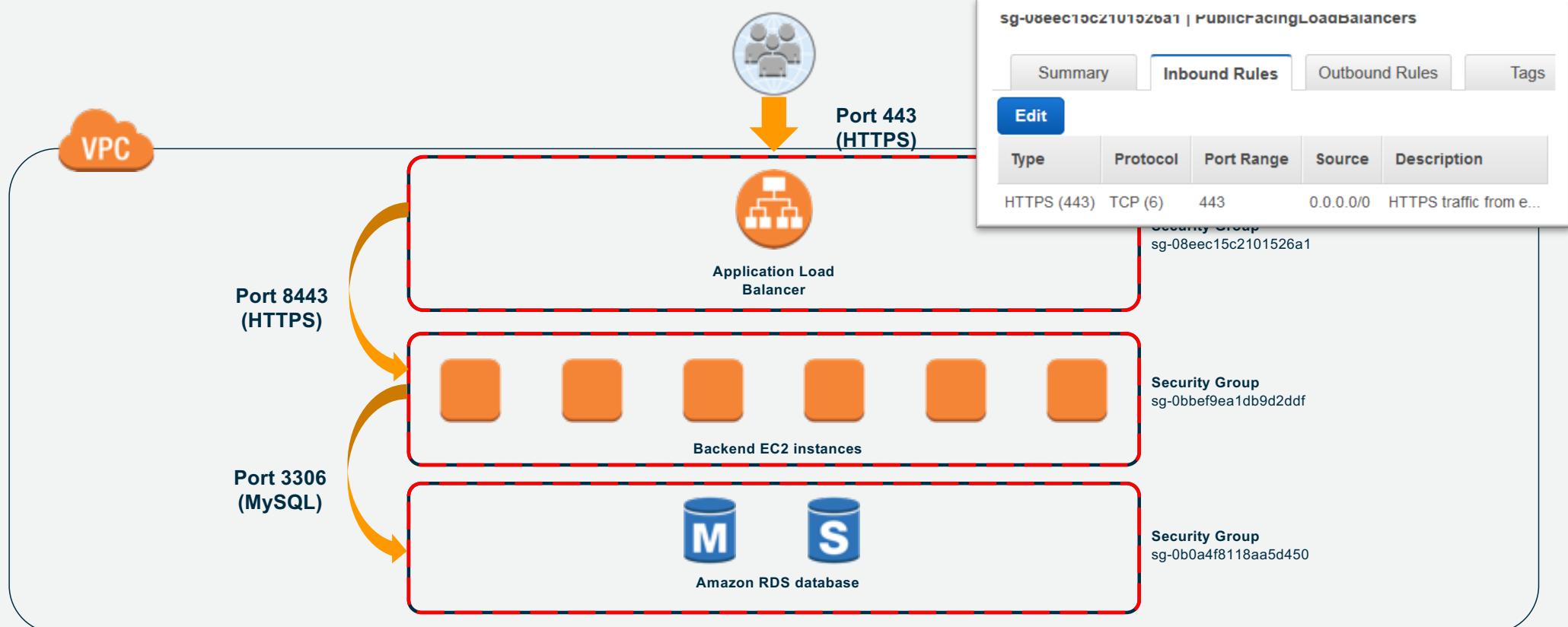
Grails App on AWS



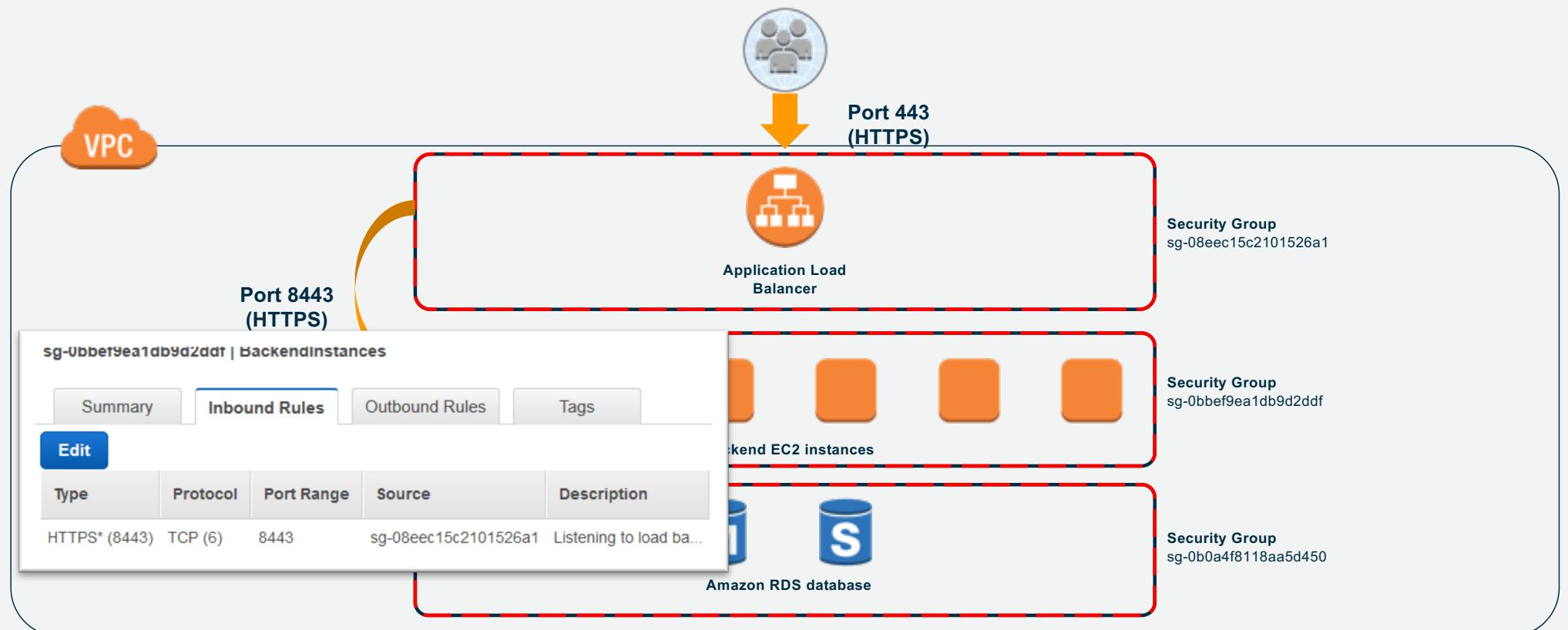
Security Groups: Stateful network firewalls



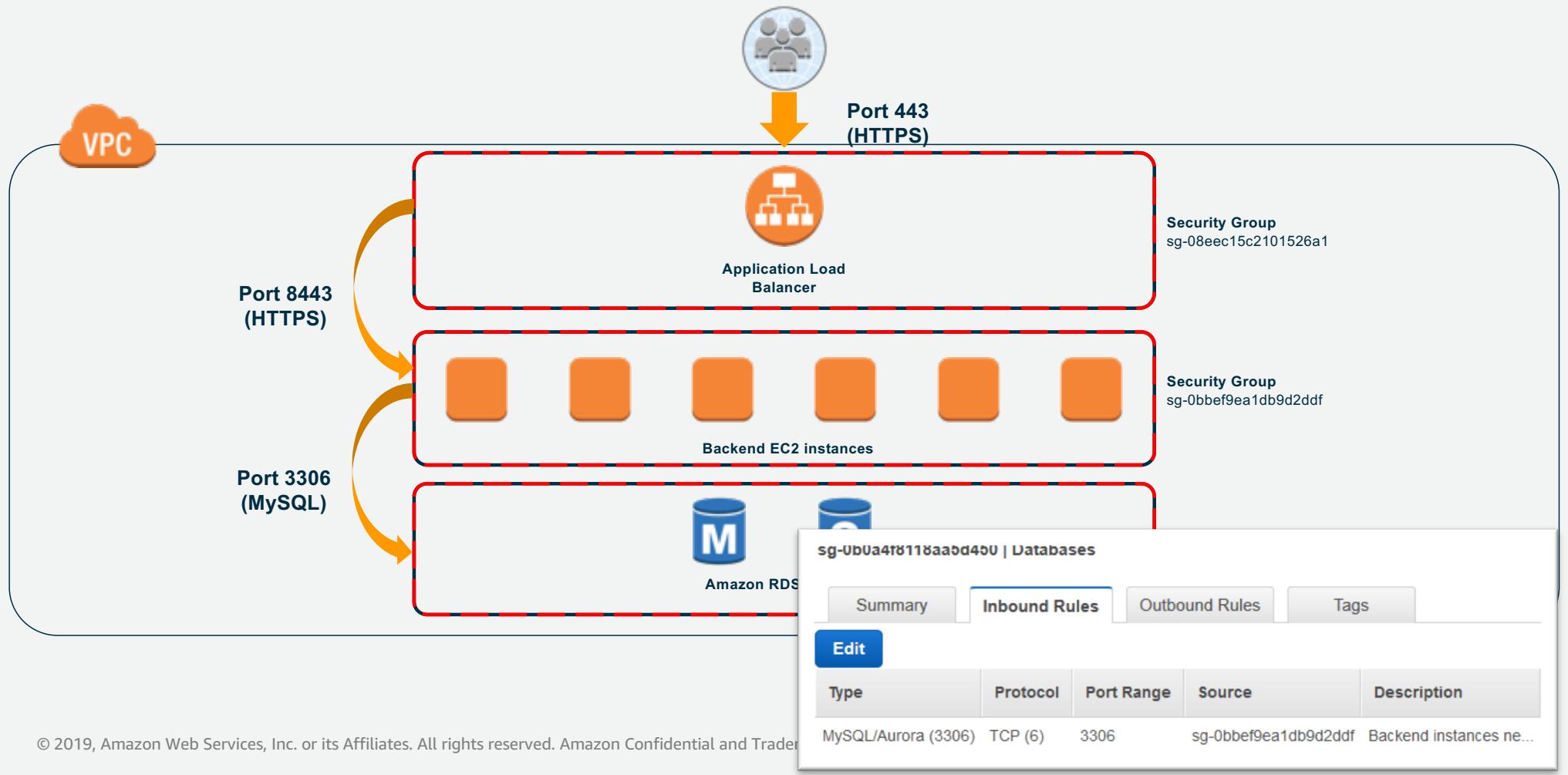
Security Groups: Stateful network firewalls



Security Groups: Stateful network firewalls



Security Groups: Stateful network firewalls

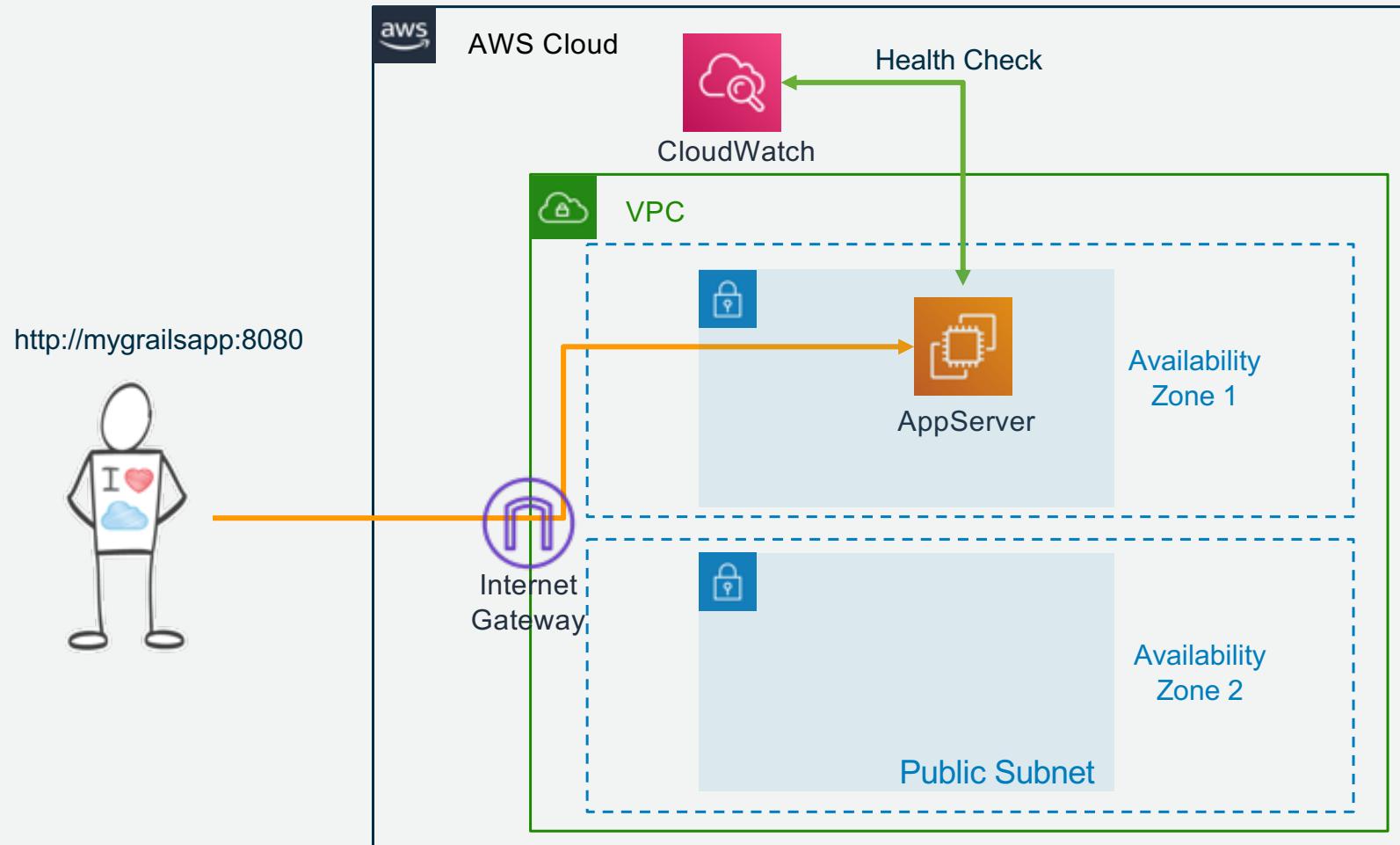


Hands-On Session

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Goal: Deploy your Grails Application on EC2



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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 dark header bar with the AWS logo, a navigation bar with 'Services' and 'Resource Groups' dropdowns, and a user profile section with a bell icon, the email 'cvolkmer_consadmin @ cvolk...', and a location 'N. Virginia'. Below the header, the main content area has a title 'AWS Management Console'. On the left, there's a sidebar titled 'AWS services' with a 'Find Services' input field containing 'EC2'. A dropdown menu lists several services: 'EC2' (selected), 'ECS', 'EFS', 'GuardDuty', and 'All services'. To the right, there are two sections: 'Access resources on the go' (with a mobile phone icon) and 'Explore AWS' (with a link to 'Open Distro for Elasticsearch'). At the bottom, there is a copyright notice for Amazon Web Services and the AWS logo.

AWS Management Console

AWS services

Find Services
You can enter names, keywords or acronyms.

EC2
Virtual Servers in the Cloud

ECS
Run and Manage Docker Containers

EFS
Managed File Storage for EC2

GuardDuty
Intelligent Threat Detection to Protect Your AWS Accounts and Workloads

All services

Access resources on the go

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

Explore AWS

Open Distro for Elasticsearch
A 100% open-source, community driven distribution of Elasticsearch with enterprise-grade security and alerting features. [Learn more](#)

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aws

Step 2: Launch a new EC2 instance

The screenshot shows the AWS EC2 Dashboard. On the left, there's a sidebar with navigation links: EC2 Dashboard, Events, Tags, Reports, Limits, INSTANCES (with sub-links Instances, Launch Templates, Spot Requests, Reserved Instances, Dedicated Hosts, Scheduled Instances, Capacity Reservations), IMAGES (with sub-links AMIs, Bundle Tasks), and ELASTIC BLOCK STORE (with sub-links Volumes, Snapshots, Lifecycle Manager). The main content area has a title 'Resources' and a summary of resources in the US East (N. Virginia) region: 1 Running Instances, 0 Dedicated Hosts, 1 Volumes, 1 Key Pairs, 0 Placement Groups, 0 Elastic IPs, 0 Snapshots, 0 Load Balancers, and 5 Security Groups. Below this is a callout box with the text 'Learn more about the latest in AWS Compute from AWS re:Invent by viewing the [EC2 Videos](#).'. The 'Create Instance' section follows, with a note: 'To start using Amazon EC2, you will want to launch a virtual server, known as an Amazon EC2 instance.' A prominent blue button labeled 'Launch Instance' is highlighted with a red rectangle. Below it, a note says 'Note: Your instances will launch in the US East (N. Virginia) region.' To the right, there are two cards: 'Service Health' (Service Status: US East (N. Virginia); Availability Zone Status: green checkmark) and 'Scheduled Events' (US East (N. Virginia): No events).

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

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.

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

Cancel and Exit

Quick Start

Category	AMI Name	Description	Select	Architecture
My AMIs	Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0c6b1d09930fac512 (64-bit x86) / ami-0dd387866de2504e4 (64-bit Arm)	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.	<input checked="" type="button" value="Select"/>	<input checked="" type="radio"/> 64-bit (x86) <input type="radio"/> 64-bit (Arm)
AWS Marketplace	Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-0756fbca465a59a30	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.	<input type="button" value="Select"/>	<input type="radio"/> 64-bit (x86)
Community AMIs	Red Hat Enterprise Linux 8 (HVM), SSD Volume Type - ami-098bb5d92c8886ca1 (64-bit x86) / ami-07bd28c96286169fa (64-bit Arm)	Red Hat Enterprise Linux version 8 (HVM), EBS General Purpose (SSD) Volume Type	<input type="button" value="Select"/>	<input checked="" type="radio"/> 64-bit (x86) <input type="radio"/> 64-bit (Arm)
	SUSE Linux Enterprise Server 15 (HVM), SSD Volume Type - ami-06ea7729e394412c8 (64-bit x86) / ami-0d7279e0c13593cb7 (64-bit Arm)	SUSE Linux Enterprise Server 15 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled.	<input type="button" value="Select"/>	<input checked="" type="radio"/> 64-bit (x86) <input type="radio"/> 64-bit (Arm)
	Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-0a313d6098716f372 (64-bit x86) / ami-01ac7d9c1179d7b74 (64-bit Arm)	Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services).	<input type="button" value="Select"/>	<input checked="" type="radio"/> 64-bit (x86) <input type="radio"/> 64-bit (Arm)

1 to 38 of 38 AMIs

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

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

Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: All instance types ▾ Current generation ▾ Show/Hide Columns

Currently selected: t2.medium (Variable ECUs, 2 vCPUs, 2.3 GHz, Intel Broadwell E5-2686v4, 4 GiB memory, EBS only)

	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: Enter the Bootstrap Information

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

Step 3: Configure Instance Details
Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances: 1 Launch into Auto Scaling Group

Purchasing option: Request Spot instances

Advanced Details

User data:

As text As file Input is already base64 encoded

```
#!/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
```

Amazon charges may apply

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

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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
```

Step 6: Add a virtual harddisk

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

Step 4: Add Storage

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/xvda	snap-04a92f3aceecdbef	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](#)

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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	(127 characters maximum)	Value	(255 characters maximum)	Instances	Volumes	
Name		GrailsApp		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Add another tag (Up to 50 tags maximum)

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

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Step 8: Configure ports allowed

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

Step 6: Configure Security Group

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

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
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
Custom TCP	TCP	8080	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop

Add Rule

⚠ 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** 

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Step 9: Review the settings in launch your instance

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

Step 7: Review Instance Launch

⚠ Improve your instances' security. Your security group, GrailsApp, is open to the world.
Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.
You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

⚠ Your instance configuration is not eligible for the free usage tier
To launch an instance that's eligible for the free usage tier, check your AMI selection, instance type, configuration options, or storage devices. Learn more about [free usage tier](#) eligibility and usage restrictions.

[Don't show me this again](#)

AMI Details [Edit AMI](#)

Amazon Linux 2 AMI (HVM), SSD Volume Type - ami-0c6b1d09930fac512
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](#)

Type <small>i</small>	Protocol <small>i</small>	Port Range <small>i</small>	Source <small>i</small>	Description <small>i</small>
SSH	TCP	22	0.0.0.0/0	
Custom TCP Rule	TCP	8080	0.0.0.0/0	

[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](#).

Create a new key pair

Key pair name Download Key Pair

Info You have to download the **private key file (*.pem file)** before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

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-0c393d7880730e81b 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](#)
- [Amazon EC2: User Guide](#)
- [Learn about AWS Free Usage Tier](#)
- [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](#)

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

Step 12: Explore the instance details

GrailsApp i-0c393d7880730e81b t2.medium us-east-1a running Initializing None ec2-34-239-49-17.com... 34.239.49.17 - GrailsApp

Instance: i-0c393d7880730e81b (GrailsApp) Public DNS: ec2-34-239-49-17.compute-1.amazonaws.com

Description Status Checks Monitoring Tags

Instance ID	i-0c393d7880730e81b	Public DNS (IPv4)	ec2-34-239-49-17.compute-1.amazonaws.com
Instance state	running	IPv4 Public IP	34.239.49.17
Instance type	t2.medium	IPv6 IPs	-
Elastic IPs		Private DNS	ip-172-31-35-244.ec2.internal
Availability zone	us-east-1a	Private IPs	172.31.35.244
Security groups	GrailsApp, view inbound rules, view outbound rules	Secondary private IPs	
Scheduled events	No scheduled events	VPC ID	vpc-08046773
AMI ID	amzn2-ami-hvm-2.0.20190508-x86_64-gp2 (ami-0c6b1d09930fac512)	Subnet ID	subnet-62b7ba3f
Platform	-	Network interfaces	eth0
IAM role	-	Source/dest. check	True
Key pair name	GrailsApp	T2/T3 Unlimited	-
Owner	857090637333	EBS-optimized	False
Launch time	May 23, 2019 at 8:24:05 AM UTC+2 (less than one hour)	Root device type	ebs
Termination protection	-	Root device	/dev/xvda
Lifecycle	normal	Block devices	/dev/xvda
Monitoring	basic	Elastic Graphics ID	-
Alarm status	None	Elastic Inference accelerator ID	-
Kernel ID	-	Capacity Reservation	-

Step 13: Connect to your instance (ssh)

Connect To Your Instance

I would like to connect with A standalone SSH client ⓘ A Java SSH Client directly from my browser (Java required) ⓘ

To access your instance:

1. Open an SSH client. (find out how to [connect using PuTTY](#))
2. Locate your private key file (GrailsApp.pem). The wizard automatically detects the key you used to launch the instance.
3. Your key must not be publicly viewable for SSH to work. Use this command if needed:
`chmod 400 GrailsApp.pem`
4. Connect to your instance using its Public DNS:
`ec2-34-239-49-17.compute-1.amazonaws.com`

Example:

```
ssh -i "GrailsApp.pem" ec2-user@ec2-34-239-49-17.compute-1.amazonaws.com
```

Please note that in most cases the username above will be correct, however please ensure that you read your AMI usage instructions to ensure that the AMI owner has not changed the default AMI username.

If you need any assistance connecting to your instance, please see our [connection documentation](#).

[Close](#)

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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

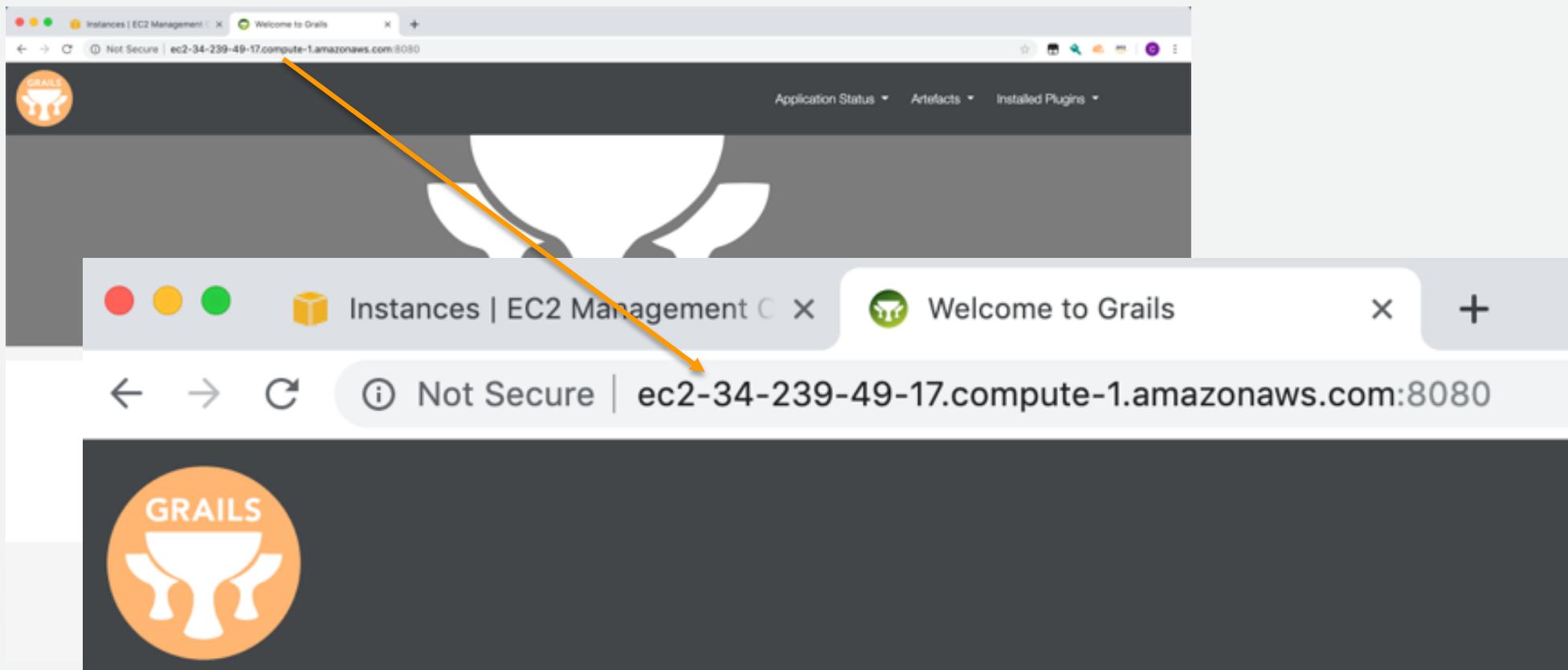
```
1. ec2-user@ip-172-31-35-244:~ (ssh)
cvolkmer@8c8590cd36f4 ~ cd Downloads
cvolkmer@8c8590cd36f4 ~/Downloads chmod 400 GrailsApp.pem
cvolkmer@8c8590cd36f4 ~/Downloads ssh -i GrailsApp.pem ec2-user@ec2-34-239-49-17.compute-1.amazonaws.com
The authenticity of host 'ec2-34-239-49-17.compute-1.amazonaws.com (34.239.49.17)' can't be established.
ECDSA key fingerprint is SHA256:Xxp787DBwQWS9+ljFWQ8tjm4IfIMwUDUloFnIF7RroY.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-34-239-49-17.compute-1.amazonaws.com,34.239.49.17' (ECDSA) to the list of known hosts.

 _|_ _|_
 _| ( / Amazon Linux 2 AMI
 _\|_|_|

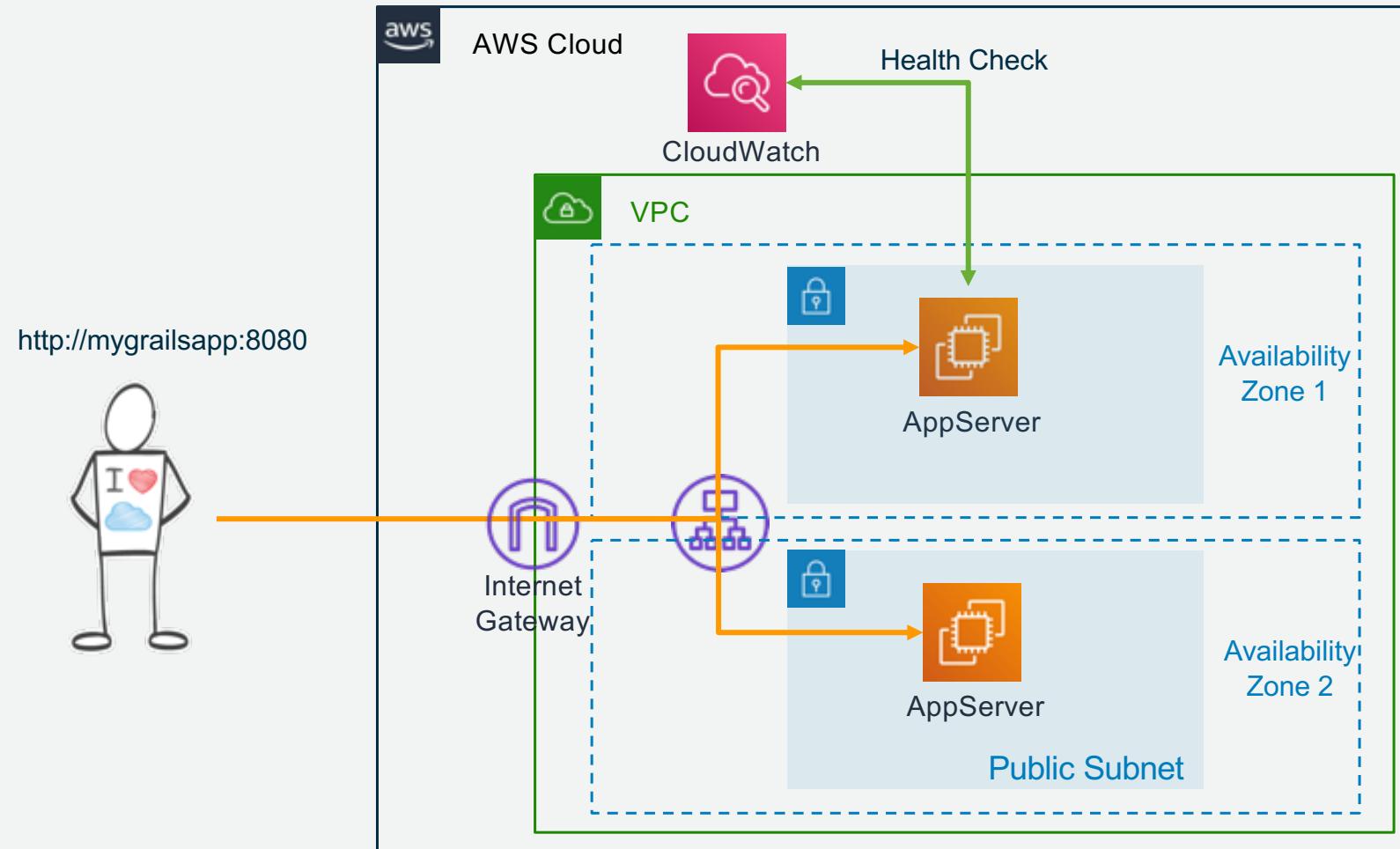
https://aws.amazon.com/amazon-linux-2/
-bash: warning: setlocale: LC_CTYPE: cannot change locale (UTF-8): No such file or directory
[ec2-user@ip-172-31-35-244 ~]$ ls -lsa
total 12
0 drwx----- 4 ec2-user ec2-user 97 May 23 06:25 .
0 drwxr-xr-x 3 root root 22 May 23 06:24 ..
4 -rw-r--r-- 1 ec2-user ec2-user 18 Jul 27 2018 .bash_logout
4 -rw-r--r-- 1 ec2-user ec2-user 193 Jul 27 2018 .bash_profile
4 -rw-r--r-- 1 ec2-user ec2-user 231 Jul 27 2018 .bashrc
0 drwx----- 2 ec2-user ec2-user 29 May 23 06:24 .ssh
0 drwxr-xr-x 8 root root 263 May 23 06:25 RoomReservation
[ec2-user@ip-172-31-35-244 ~]$
```

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 Artchitecture



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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



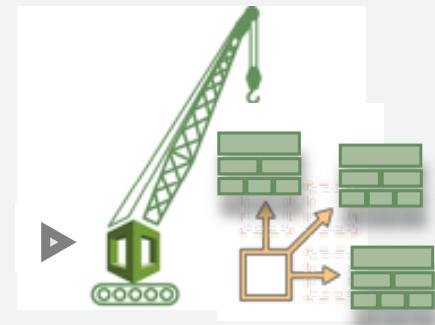
Code in YAML or JSON directly or use sample templates



Upload local files or from an S3 bucket



Create stack using console, API, or CLI



Stacks and resources are provisioned

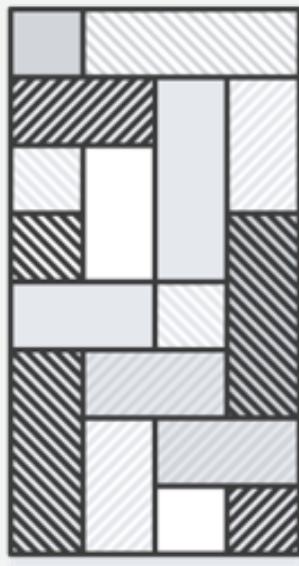
CloudFormation Demo

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Development transformation at Amazon: 2001-2009

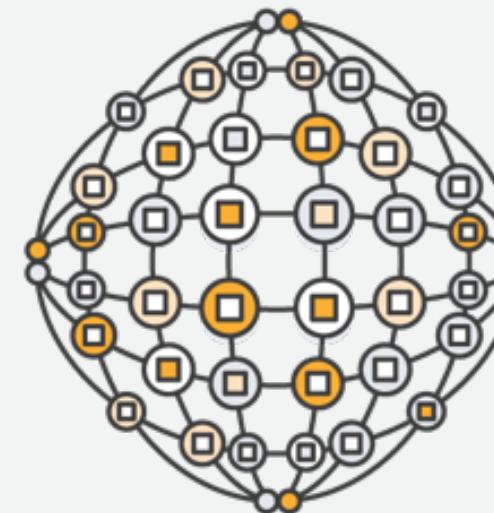
2001



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

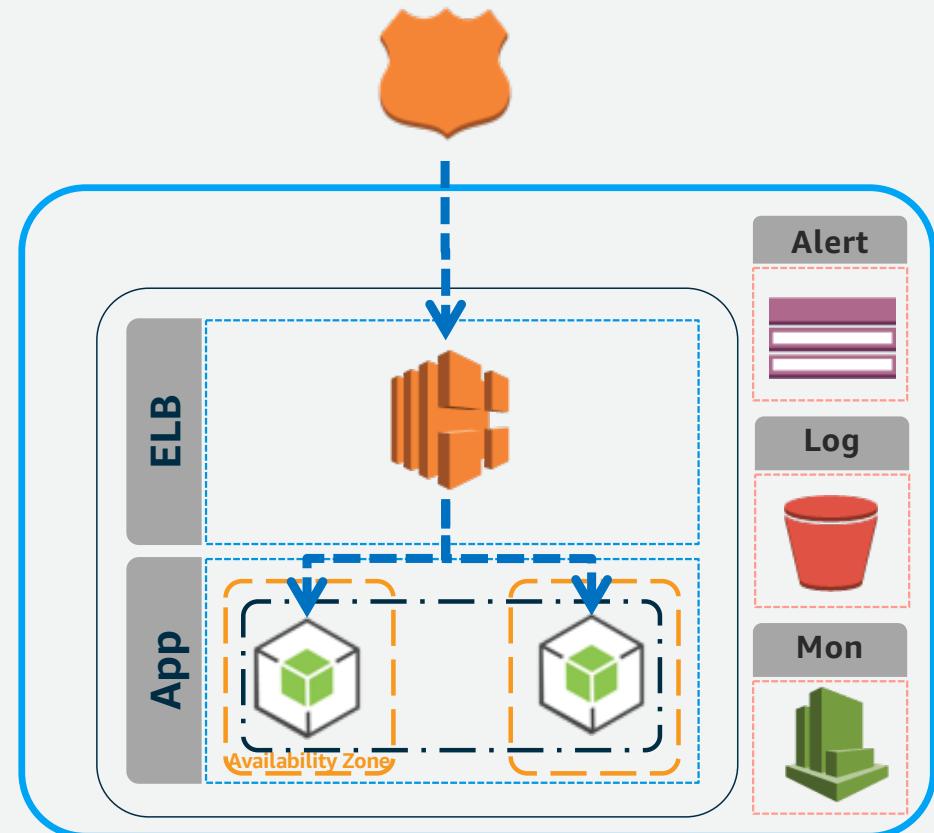
High-Level Architecture

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

`http://[your app].elasticbeanstalk.com`



How to deploy an application

01

Your code

02

Region

03

Platform type

Single Instance

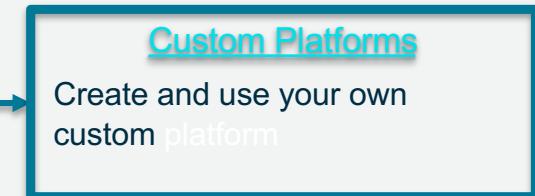
OR

Load Balanced
with Auto Scaling

04

Database (RDS)

Optional



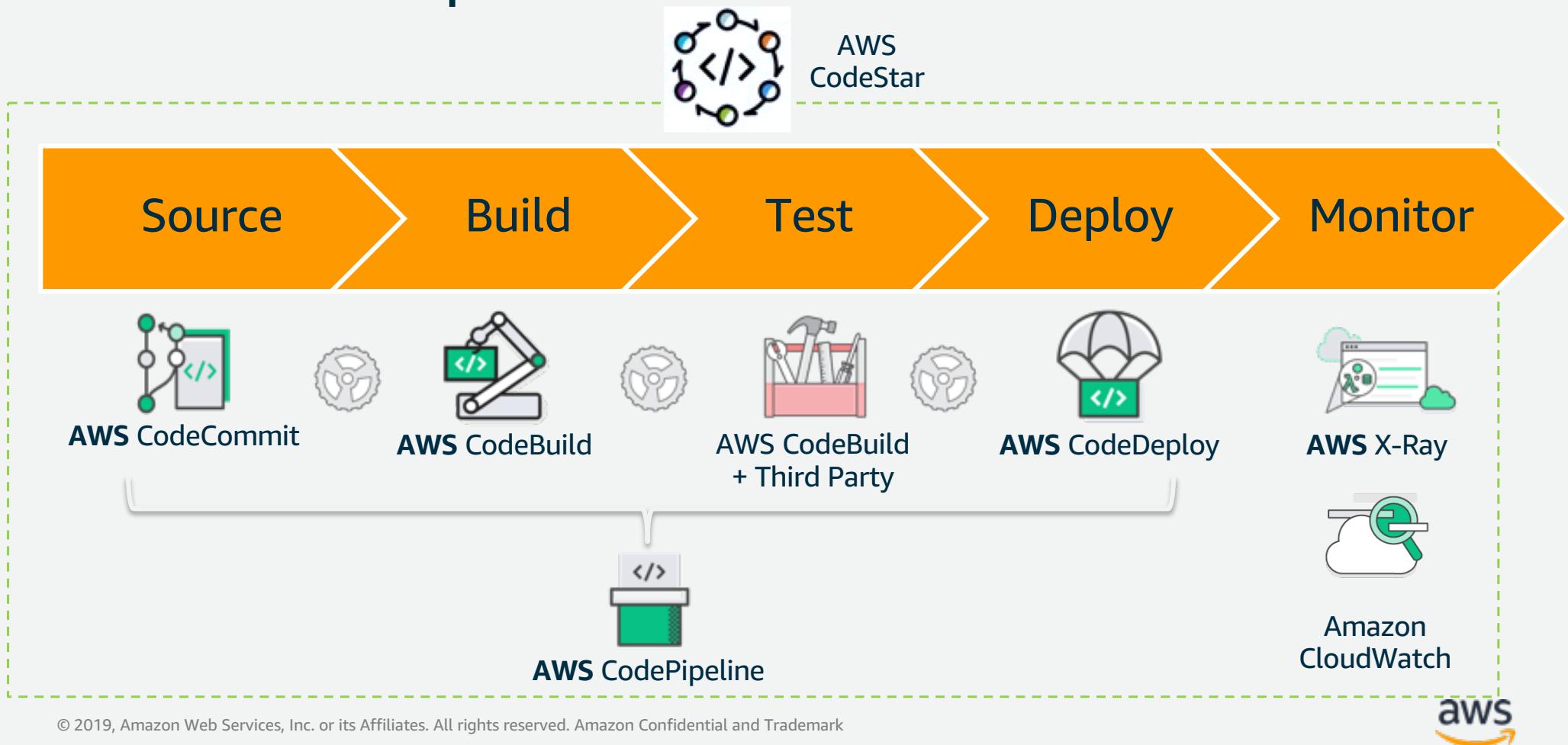
Elastic Beanstalk Demo

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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>