Launching Instances in AWS

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Overview

EC2, AMI, AWS Marketplace

The dreaded EC2 REST API

Creating (not) your first EC2 instance

Wrangling EC2 instances

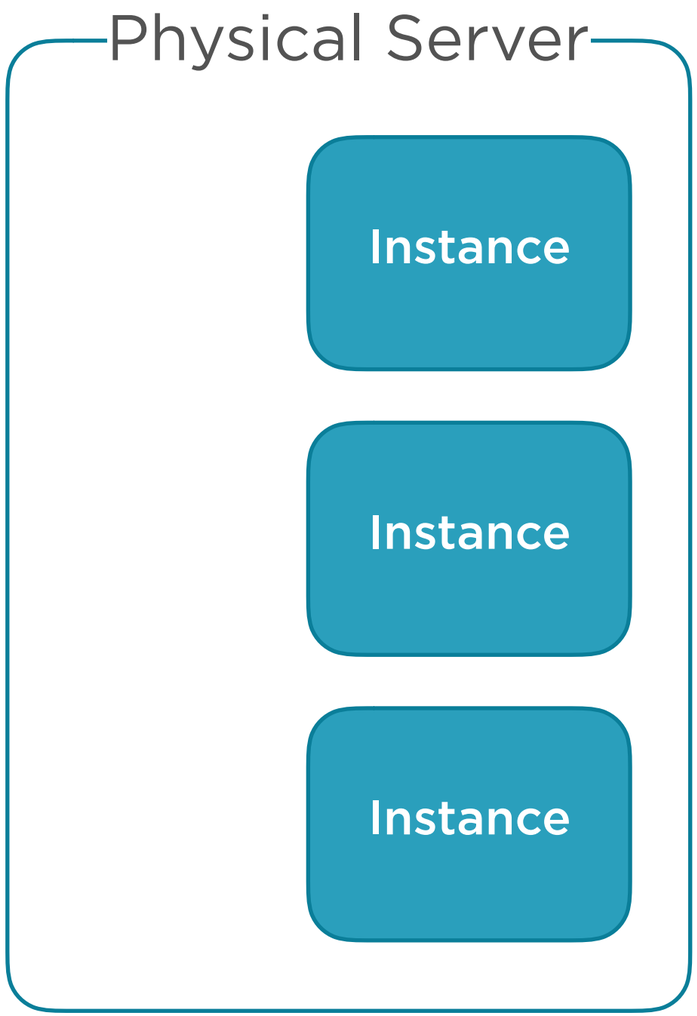
Taking a trip to the AWS Marketplace

Hand-crafting an AMI

The limits of EC2 and AMI

EC2, AMI, and the AWS Marketplace

EC2 Structure



Amazon Machine Images

Operating systems

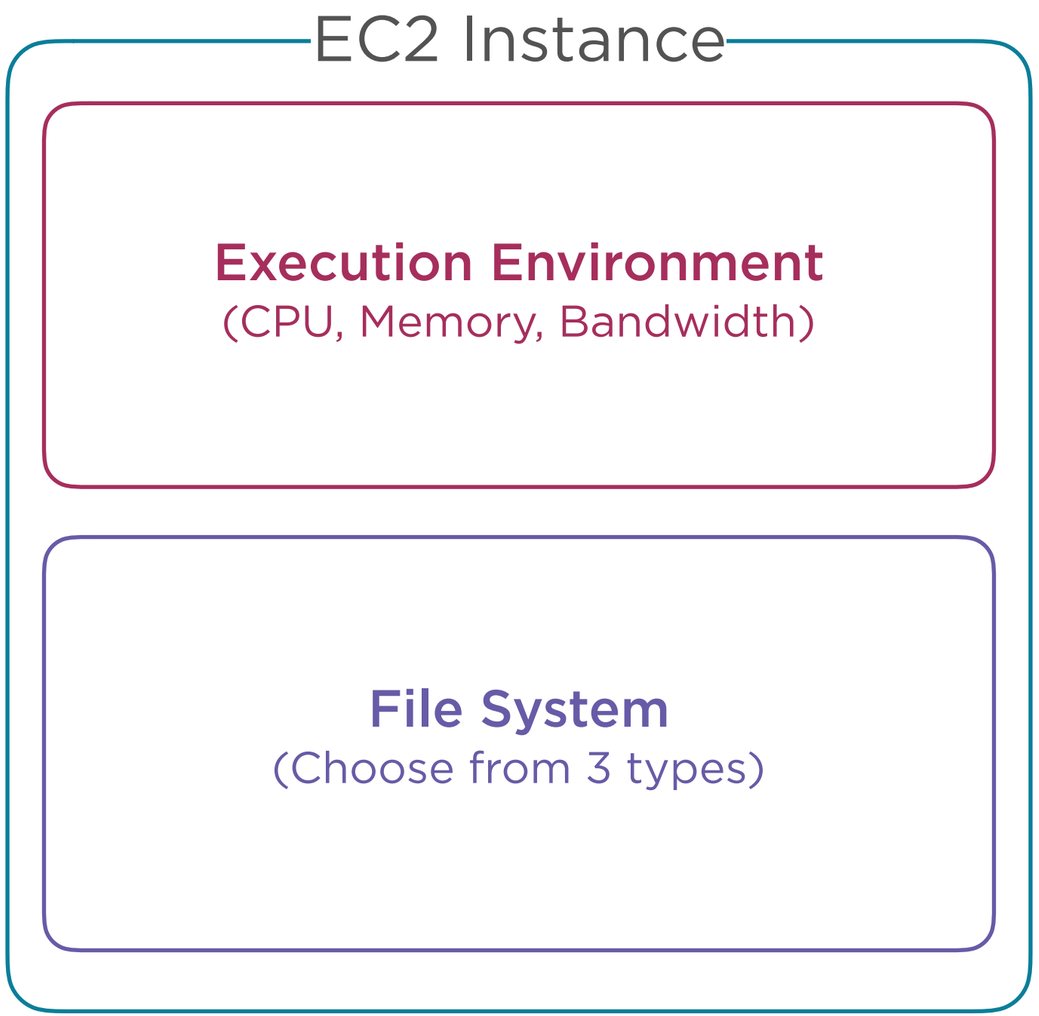
OS + software (vendor, OSS, etc.)

Create your own

Launch directly from AWS Marketplace

Create AMI from any EC2 instance

EC2 Instance Anatomy



EC2 Instance File System Types

Instance Store

Physically connected, basic hard drives

Elastic Block Storage

Independent, networked volume

Elastic File System

Scalable, independent, networked volume

Launching AMI Instances

Instance Volume Backed AMI

Cannot be stopped

Can only be terminated or restarted

Slower to boot

Data transferred from S3 on boot

EBS Backed AMI

Can be stopped

Instance data persisted on EBS

Faster to boot

Data stored in EBS

AMI Visibility

Public - Visible to everyone

Explicit - Visible to who you allow

Implicit - Private

EC2 Instance Classes

EC2 Instance Classes

Spot Instances

On-Demand Instances

Reserved Instances

The instance class defines the conditions in which the instance lives and how you pay for it

On-Demand Instances

- Pay for what you use
- No commitment
- Easy to create and delete
- Good for applications needing scaling
- Good for learning and testing EC2

Reserved Instances

Commitment for a period of time

Commitments range from 1 to 3 years

Discounts up to 75% off

Good for stable companies

Spot Instances

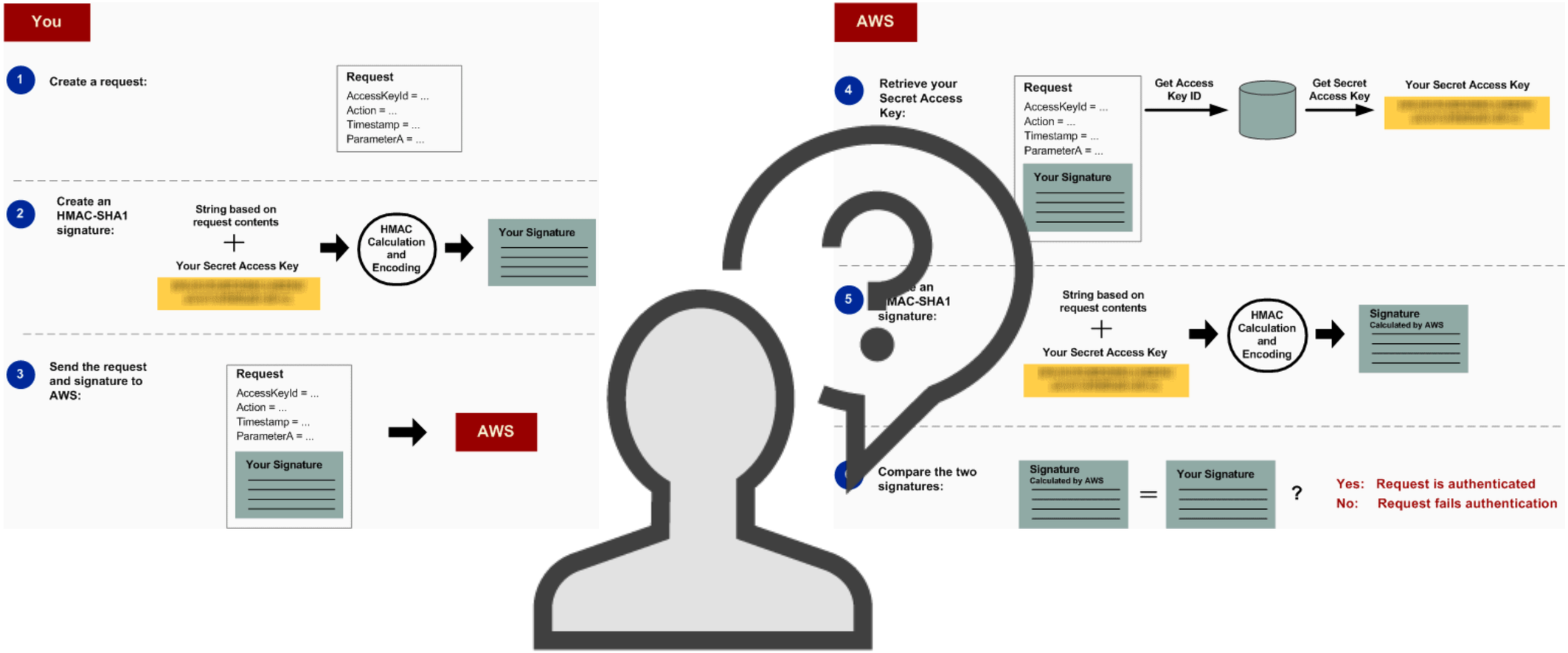
- Bid for computing resources
- Uses spare, unused EC2 capacity
- Discounts up to 90% off
- No guarantee
- Good for flexible computing jobs

The EC2 REST API

Each AWS REST API request must be signed

The AWS SDK is a code interface to the REST API

AWS REST API Authentication Process



Source: https://docs.aws.amazon.com/AmazonS3/latest/dev/S3_Authentication2.html

AWS Rest API Signature Versions

Version 2

Older version

Supported by all older services

In the process of being deprecated

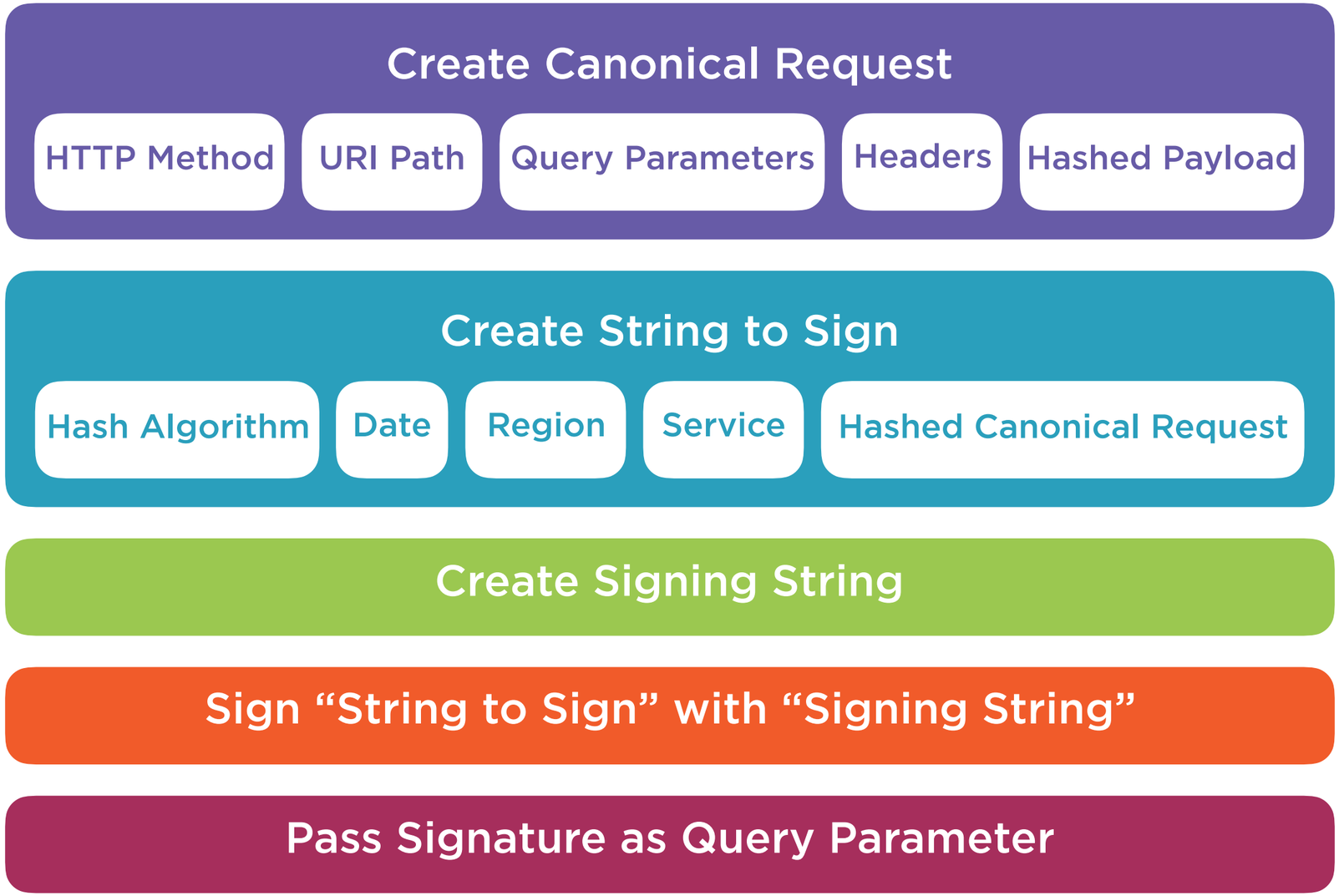
Version 4

Newer version

Only version supported in newer regions (Ohio, Canada, etc)

More secure, more complicated

Version 4 Signing Process

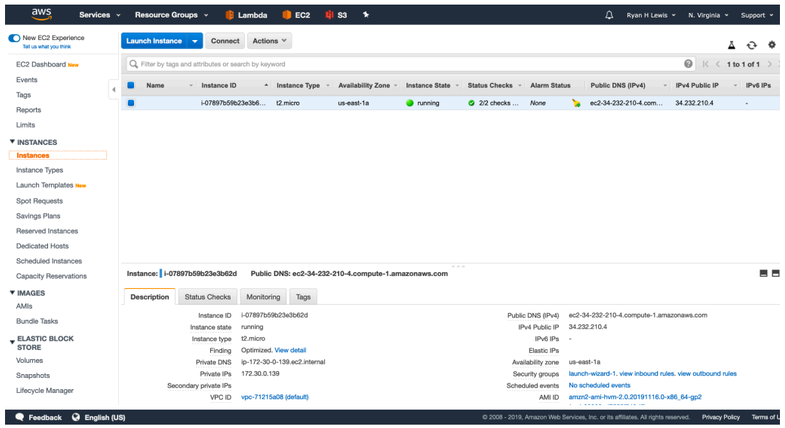


Using the SDK means never having to manually sign a request

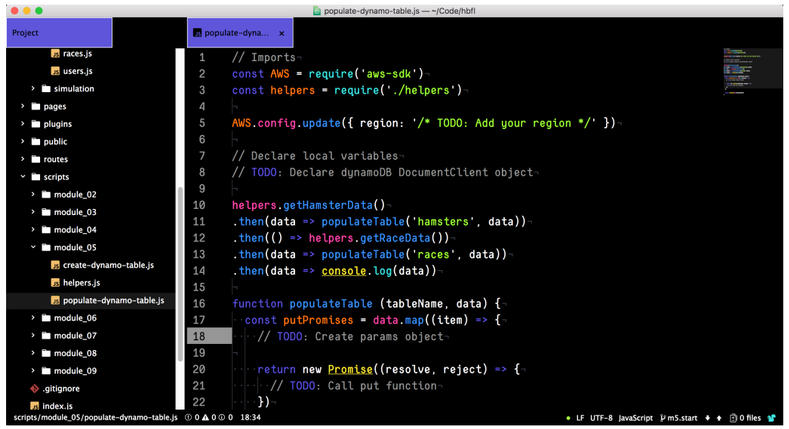
AWS SDK uses local credentials to sign requests

Creating an EC2 Security Group

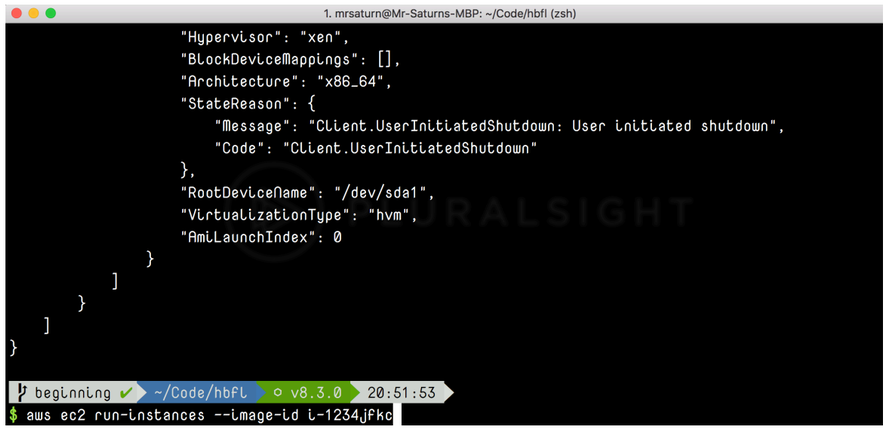
How to Create an EC2 Instance



AWS Console

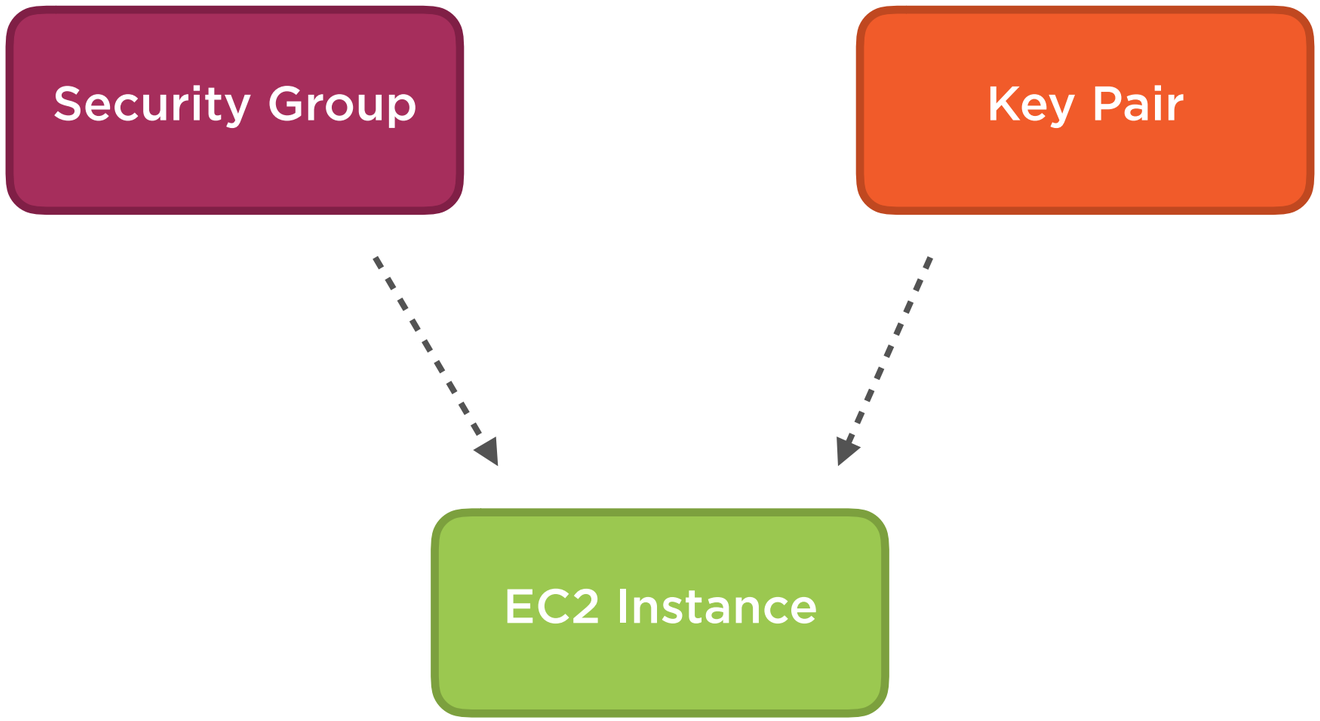


AWS SDK



AWS CLI

Components of an EC2 Instance

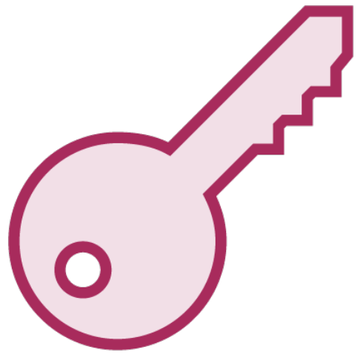


Creating an EC2 Instance

No Security Group

Default Security Group Assigned

No Key Pair



Cannot SSH

Creating an EC2 Key Pair

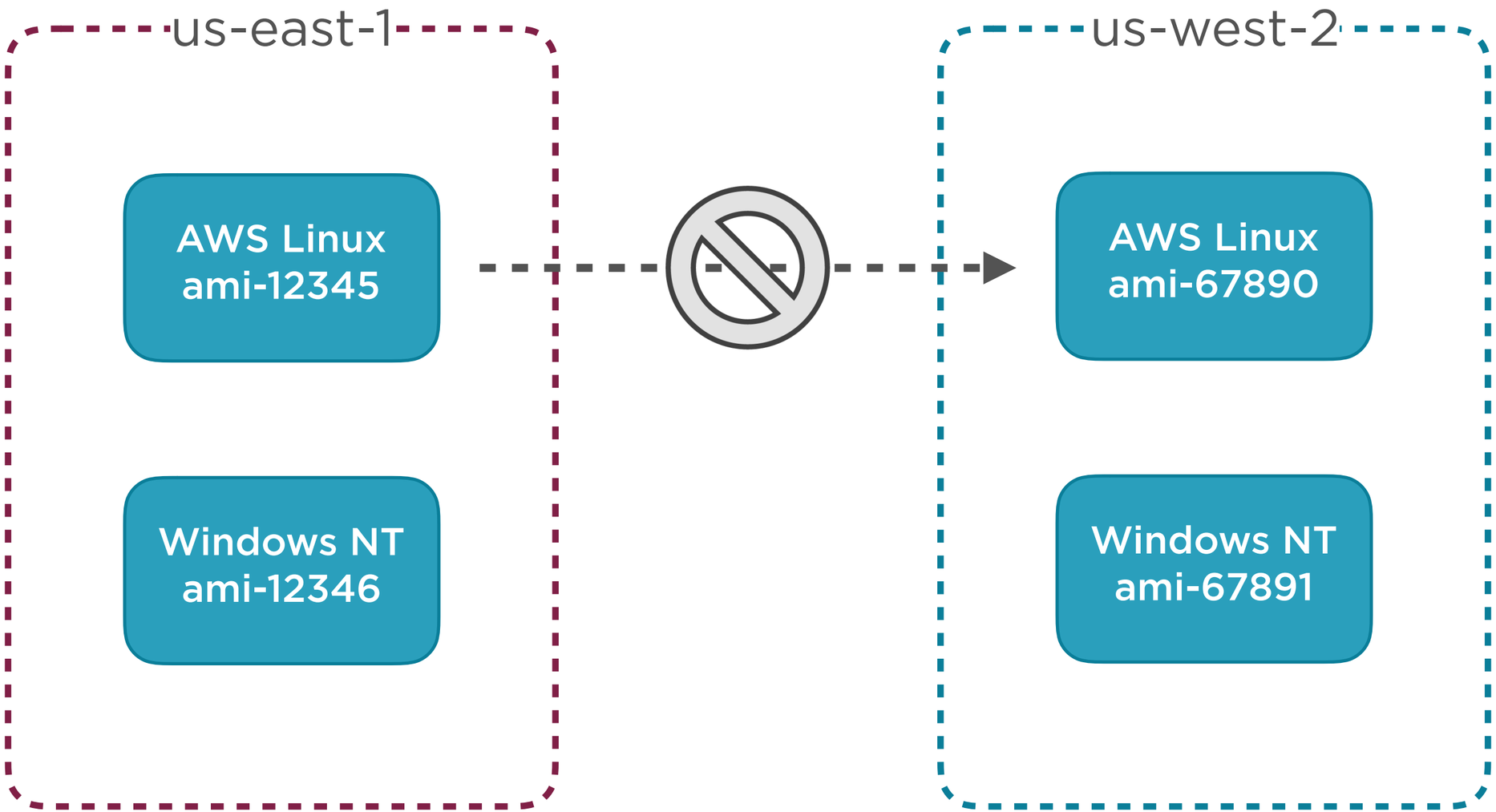
Creating an EC2 Instance

```
ec2.describeImages(params, callback)
```

List All AMIs You Can Launch

Takes a while and returns way too many hits when unfiltered

AMIs Are Region-specific



Managing EC2 Instances

```
ec2.modifyInstanceAttribute(params, callback)
```

Modifies Attributes on an EC2 Instance

Kernel

Ramdisk

Instance type

Block Device Mapping (EBS Volume)

```
ec2.describeInstances(params, callback)
```

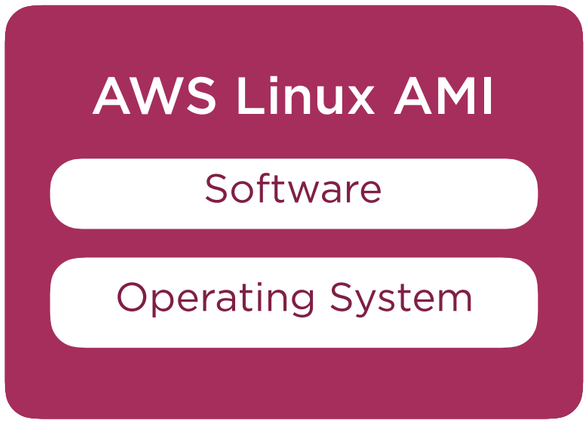
Lists All Instances in Your Account

Stopped instances can be restarted

Terminated instances cannot be restarted

Launching an EC2 Instance from the AWS Marketplace

Creating an Amazon Machine Image (AMI)


AWS Linux AMI
Software
Operating System

UserData does not persist on an AMI

UserData is configured on a launch configuration

Limits with EC2 and AMI

EC2 Limit

Maximum number of running instances per region

AMI Limit

All AMIs are region-specific

AMI Limit

10,000 maximum AMIs (due to EBS snapshot restriction)

Conclusion

Summary

EC2, instance storage and AMI

EC2 classes

Say goodbye to the EC2 REST API

Security Group + Key Pair = Instance

Terminating an innocent instance

Fresh AMI from the Marketplace

Learning AMI craftsmanship