Intro to AWS and Boto3

INTRODUCTION TO AWS BOTO IN PYTHON

Maksim Pecherskiy
Data Engineer

What is Amazon Web Services?

Our Home

Our Data Project

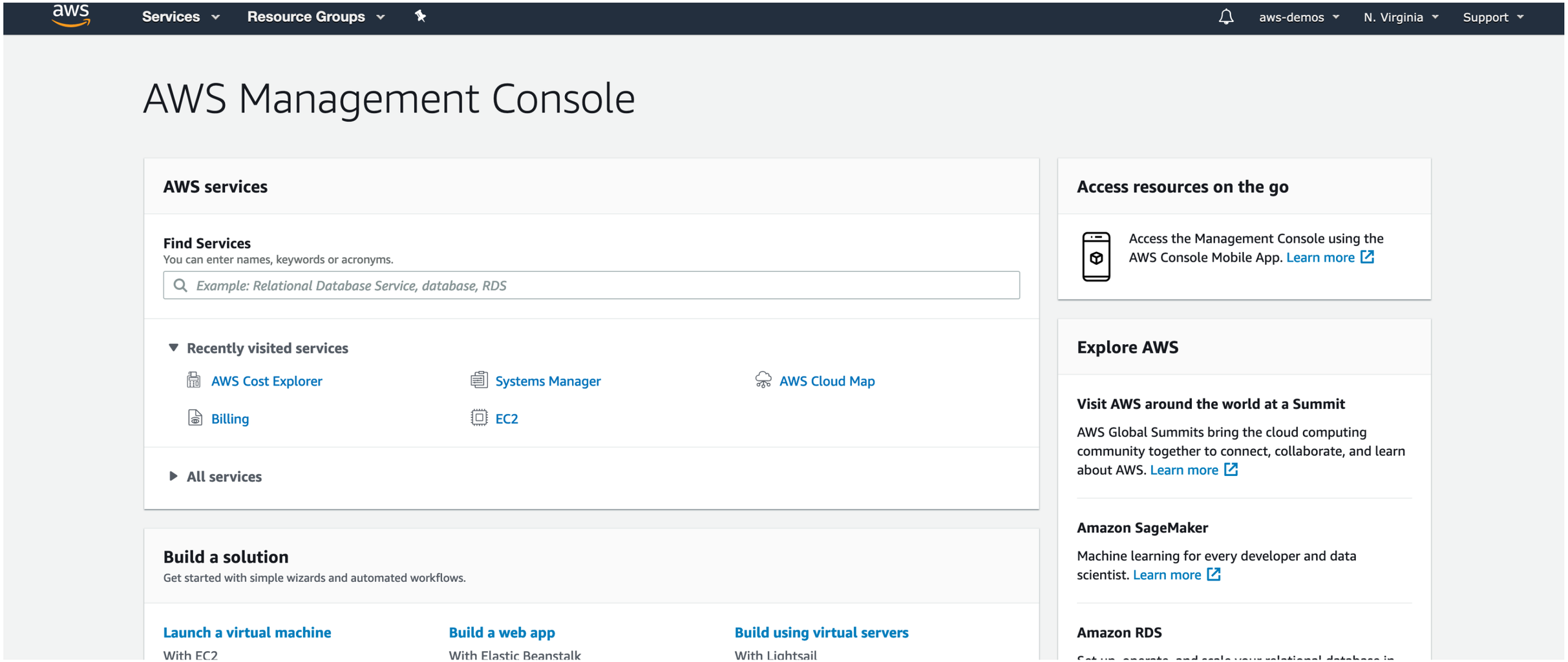
What is Boto3?

```
import boto3
```

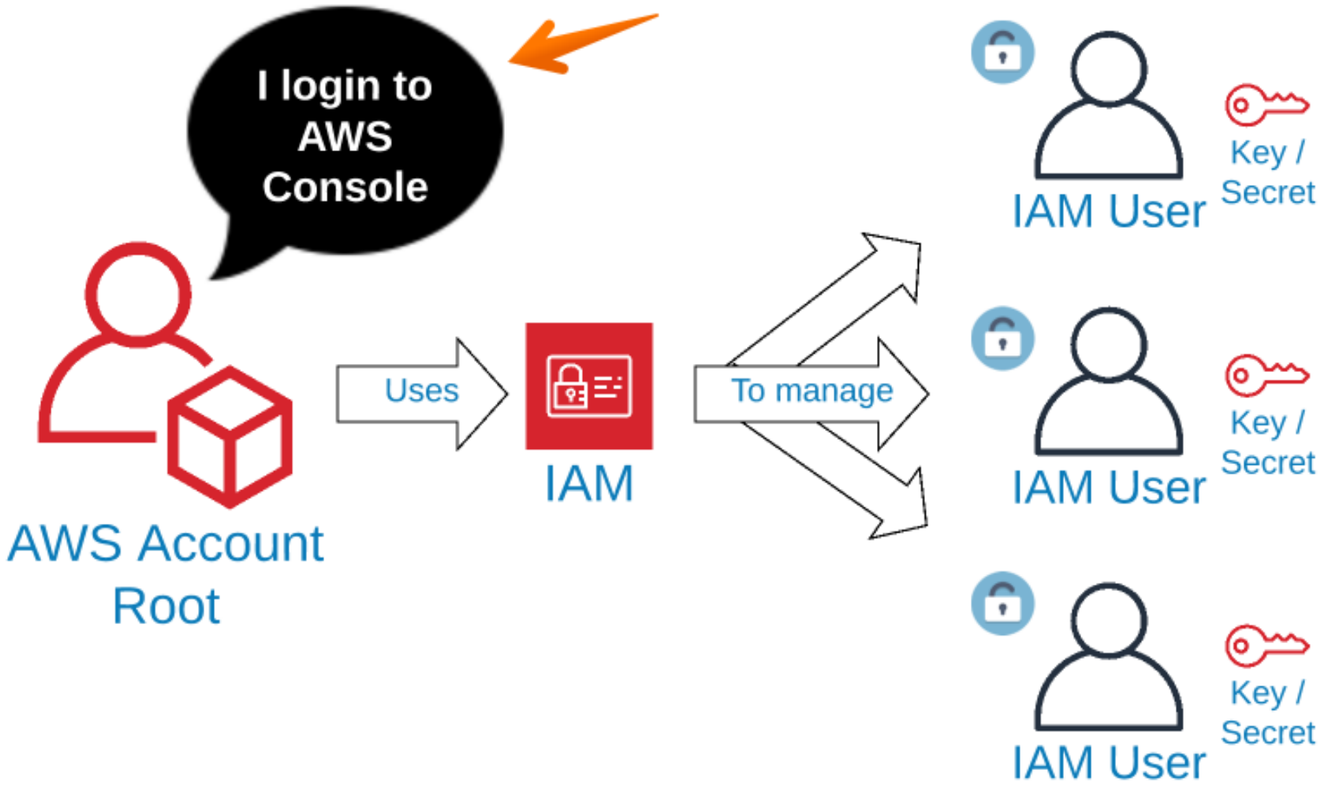
```
s3 = boto3.client('s3',
                  region_name='us-east-1',
                  aws_access_key_id=AWS_KEY_ID,
                  aws_secret_access_key=AWS_SECRET)
```

```
response = s3.list_buckets()
```

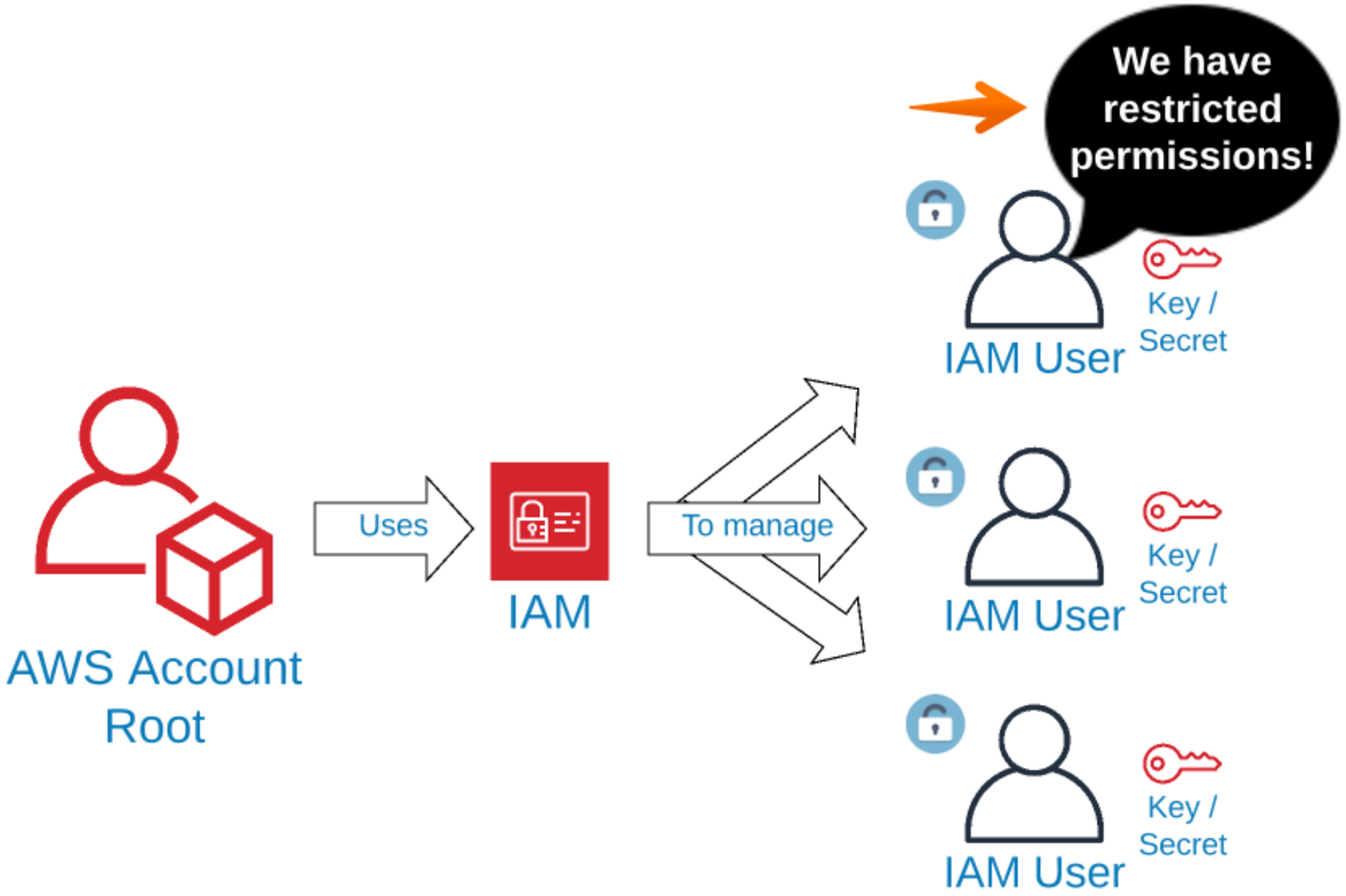
AWS console


aws
Services
Resource Groups
aws-demos
N. Virginia
Support
AWS Management Console
AWS services
Find Services
You can enter names, keywords or acronyms.
Example: Relational Database Service, database, RDS
Recently visited services
AWS Cost Explorer
Systems Manager
AWS Cloud Map
Billing
EC2
All services
Build a solution
Get started with simple wizards and automated workflows.
Launch a virtual machine
With EC2
Build a web app
With Elastic Beanstalk
Build using virtual servers
With Lightsail
Access resources on the go
Access the Management Console using the AWS Console Mobile App. Learn more
Explore AWS
Visit AWS around the world at a Summit
AWS Global Summits bring the cloud computing community together to connect, collaborate, and learn about AWS. Learn more
Amazon SageMaker
Machine learning for every developer and data scientist. Learn more
Amazon RDS

Creating keys with IAM.



Creating keys with IAM



Services | Resource Groups | aws-demos | Ohio

AWS Management Console

AWS services

Find Services
You can enter names, keywords or acronyms.

Example: Relational Database Service, database, RDS

▼ Recently visited services

IAM

▶ 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

Access resources on the go

Access the Management Console using the AWS Console Mobile App. Learn more

Explore AWS

Amazon RDS

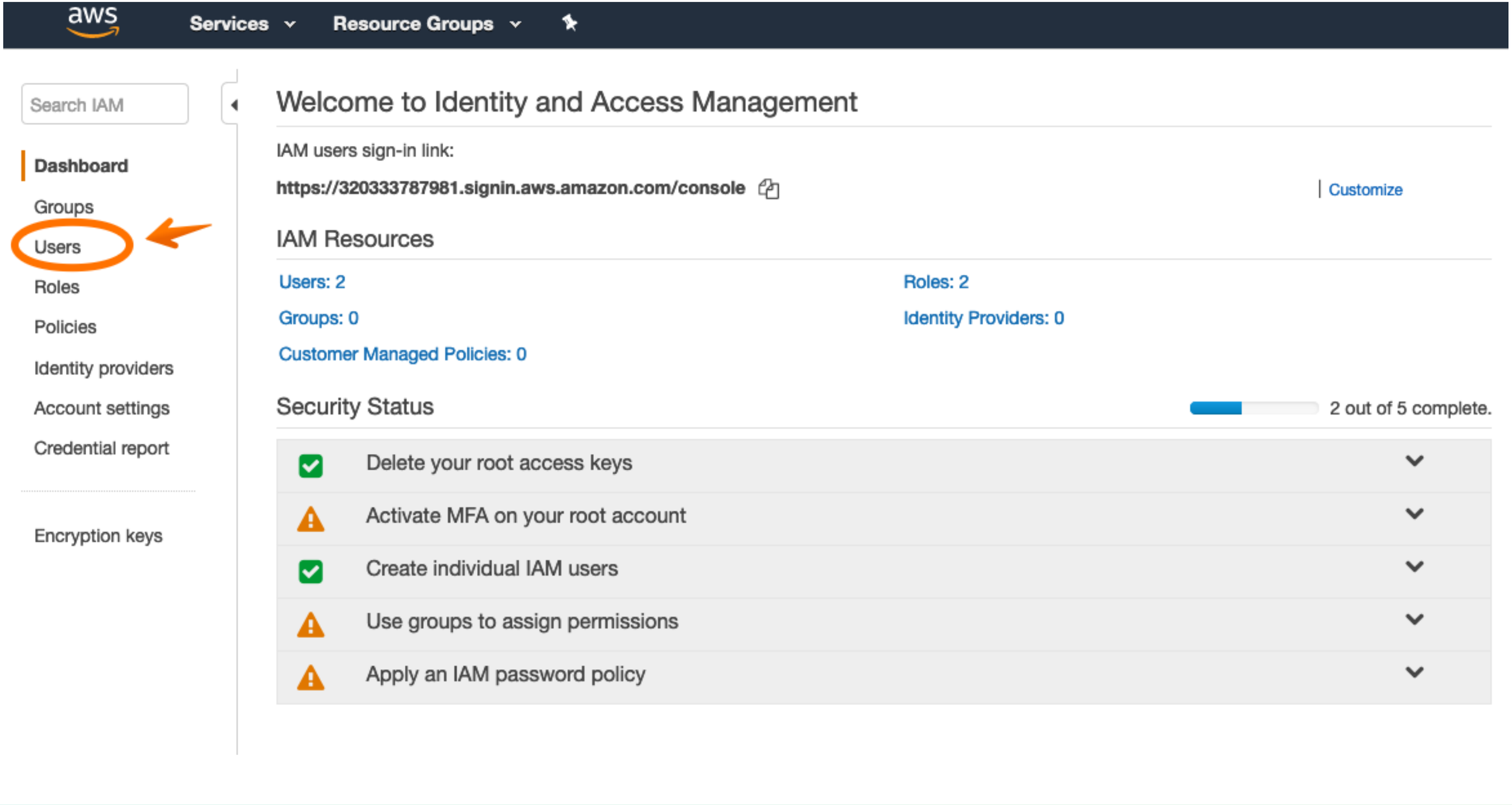
Set up, operate, and scale your relational database in the cloud. Learn more

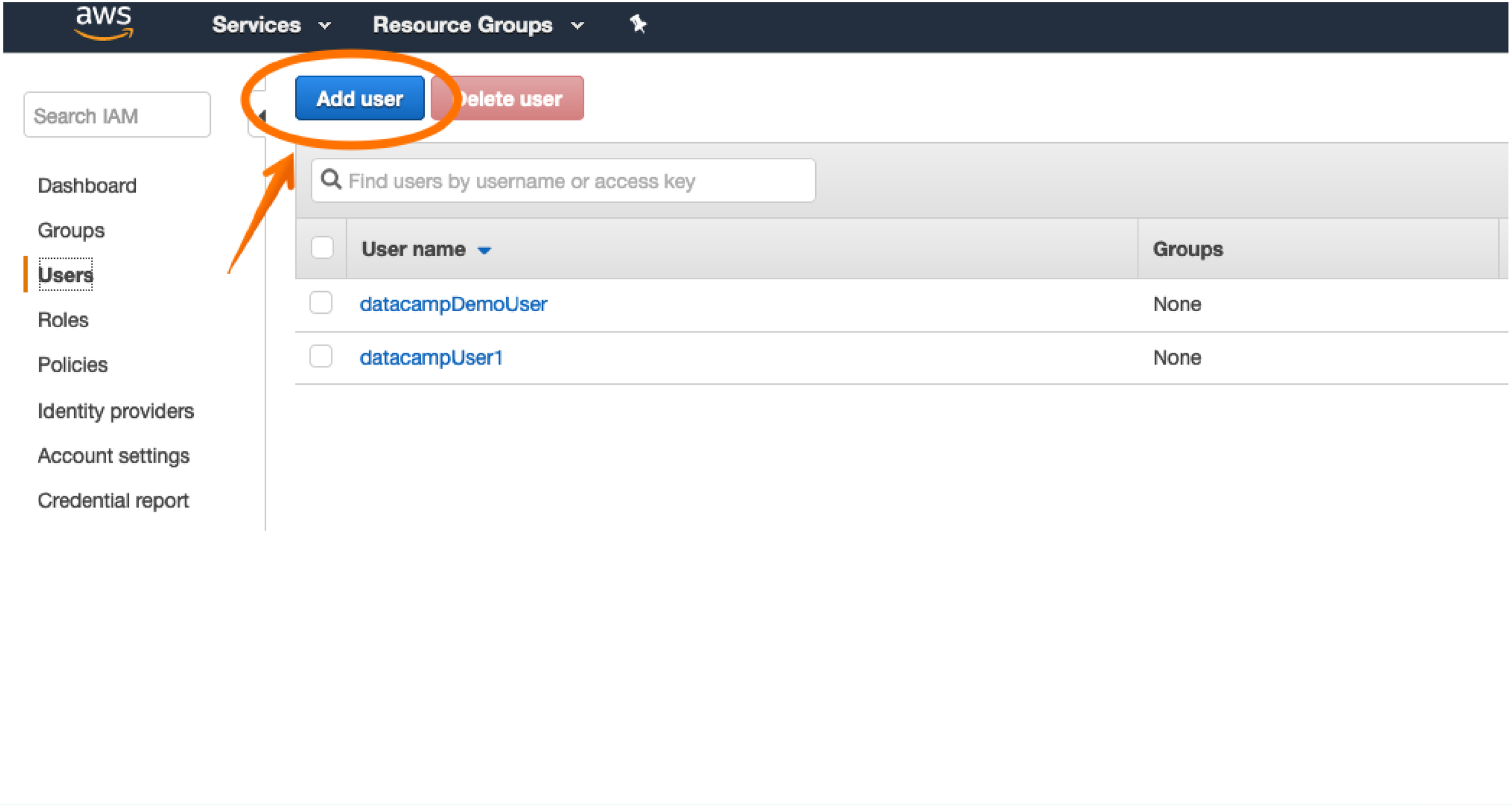
Run Serverless Containers with AWS Fargate

AWS Fargate runs and scales your containers without having to manage servers or clusters. Learn more

Amazon SageMaker

Machine learning for every developer and data scientist. Learn more


aws
Services
Resource Groups
Search IAM
Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report
Encryption keys
Welcome to Identity and Access Management
IAM users sign-in link:
https://320333787981.signin.aws.amazon.com/console
Customize
IAM Resources
Users: 2
Roles: 2
Groups: 0
Identity Providers: 0
Customer Managed Policies: 0
Security Status
2 out of 5 complete.
Delete your root access keys
Activate MFA on your root account
Create individual IAM users
Use groups to assign permissions
Apply an IAM password policy


aws
Services
Resource Groups
Search IAM
Add user
elete user
Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report
Find users by username or access key
User name
Groups
datacampDemoUser
None
datacampUser1
None

Add user

1 2 3 4 5

Set user details

You can add multiple users at once with the same access type and permissions. Learn more

User name*

This field is required.

Add another user

Select AWS access type

Select how these users will access AWS. Access keys and autogenerated passwords are provided in the last step. Learn more

Access type*

Programmatic access
Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools.

AWS Management Console access
Enables a **password** that allows users to sign-in to the AWS Management Console.

Add user

1 2 3 4 5

Set permissions

Add user to group

Copy permissions from existing user

Attach existing policies directly

Get started with groups

You haven't created any groups yet. Using groups is a best-practice way to manage users' permissions by job functions, AWS service access, or your custom permissions. Get started by creating a group. Learn more

Create group

Set permissions boundary

User details

User name	datacampDemoUser2
AWS access type	Programmatic access - with an access key
Permissions boundary	Permissions boundary is not set

Permissions summary

The following policies will be attached to the user shown ab ve.

Type	Name
Managed policy	AmazonS3FullAccess
Managed policy	AmazonSNSFullAccess
Managed policy	AmazonRekognitionFullAccess
Managed policy	ComprehendFullAccess

Add user

1 2 3 4 5

Success

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

Users with AWS Management Console access can sign-in at: https://320333787981.signin.aws.amazon.com/console

IAM User

IAM User

Key

Secret

User	Access key ID	Secret access key
datacampDemoUser2	AKIAUVFLBWNGYT2JQ7MQ	********* Show

AWS services

AWS services

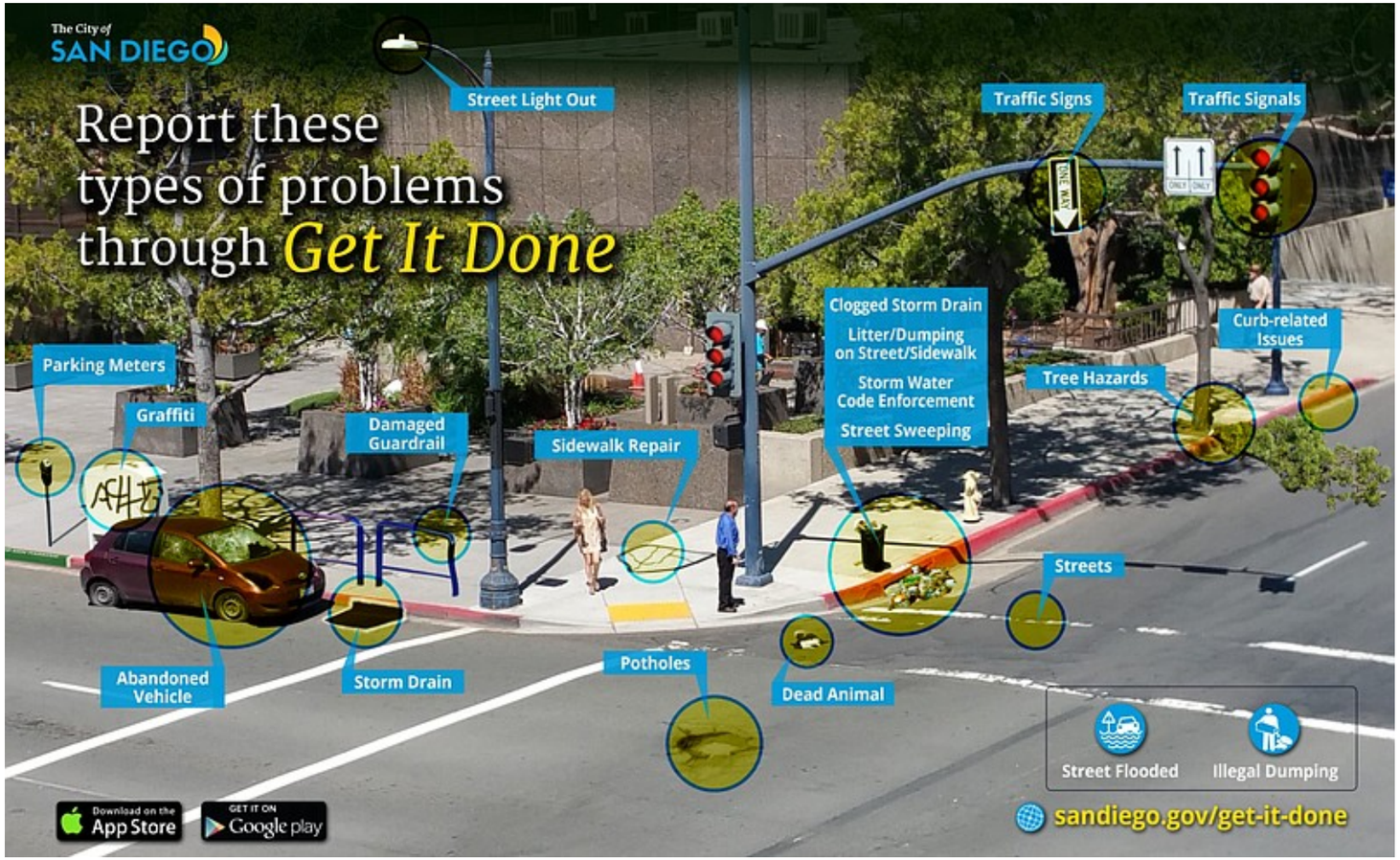
AWS services

AWS services

AWS services

Sam

GetItDone



[1] https://data.sandiego.gov/datasets/get [2] it [3] done [4] 311/

Summary

- AWS Services = Home Utilities
- IAM, S3, SNS, Comprehend and Rekognition
- AWS Key / Secret
- Connecting to S3 Using Boto

```
import boto3
s3 = boto3.client('s3',
                  region_name='us-east-1',
                  aws_access_key_id=AWS_KEY_ID,
                  aws_secret_access_key=AWS_SECRET)
```

```
response = s3.list_buckets()
```

Let's harness the cloud!

INTRODUCTION TO AWS BOTO IN PYTHON

Diving into buckets

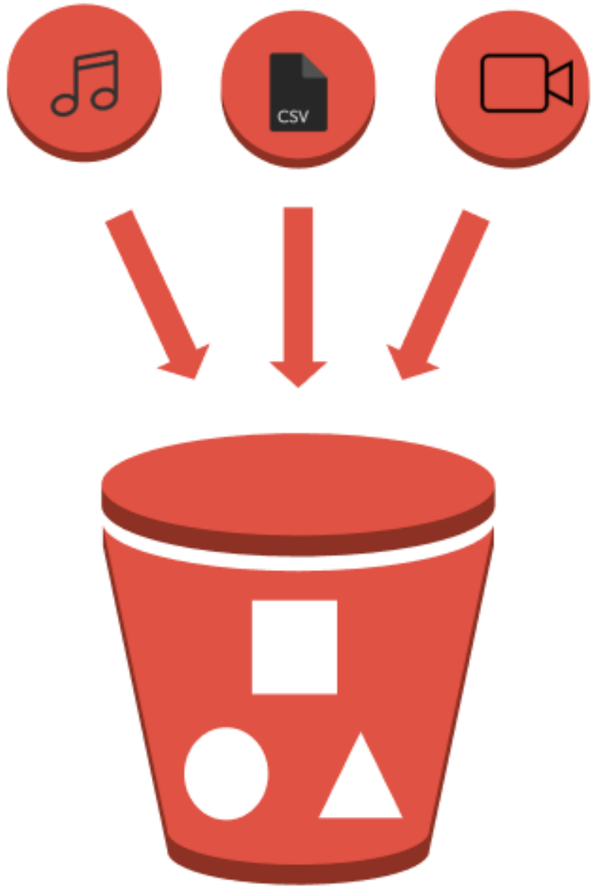
INTRODUCTION TO AWS BOTO IN PYTHON

Maksim Pecherskiy
Data Engineer

S3 Components - Buckets

- Desktop folders
- Own permission policy
- Website storage
- Generate logs

S3 Components - Objects



What can we do with buckets?

- Create Bucket
- List Buckets
- Delete Bucket

Creating a Bucket

Create boto3 client

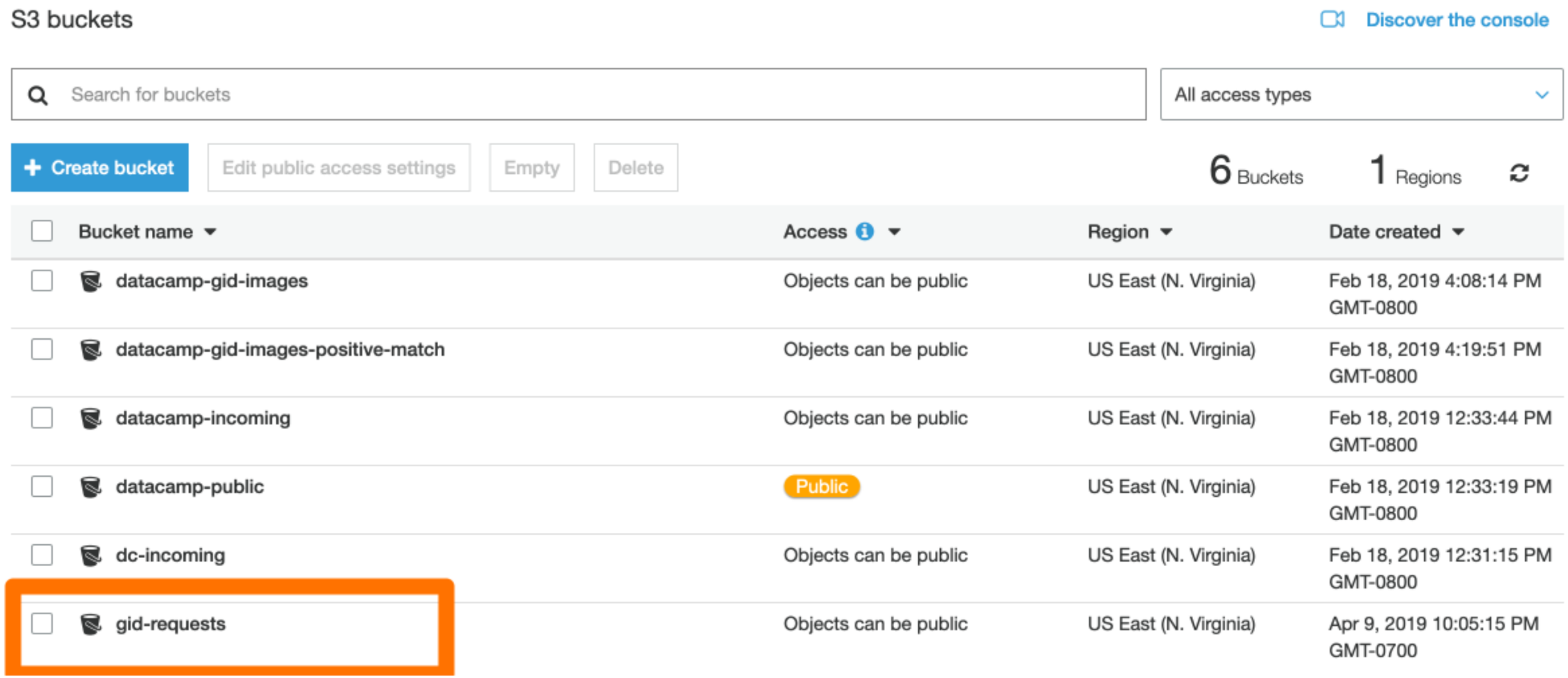
```
import boto3
s3 = boto3.client('s3', region_name='us-east-1',
                        aws_access_key_id=AWS_KEY_ID,
                        aws_secret_access_key=AWS_SECRET)
```

Create bucket!

```
bucket = s3.create_bucket(Bucket='gid-requests')
```

Bang!

Our bucket in the console



Listing buckets

Create boto3 client

```
import boto3
s3 = boto3.client('s3', region_name='us-east-1',
                        aws_access_key_id=AWS_KEY_ID,
                        aws_secret_access_key=AWS_SECRET)
```

List Buckets

```
bucket_response = s3.list_buckets()
```

Listing Buckets

Get Buckets Dictionary

```
buckets = bucket_response['Buckets']
print(buckets)
```

Listing Buckets

```
[{'Name': 'dc-incoming',
  'CreationDate': datetime.datetime(2019, 2, 18, 20, 31, 15, tzinfo=tzutc())},
 {'Name': 'gid-requests',
  'CreationDate': datetime.datetime(2019, 4, 10, 5, 5, 15, tzinfo=tzutc())}]
```

Deleting buckets

Create boto3 client

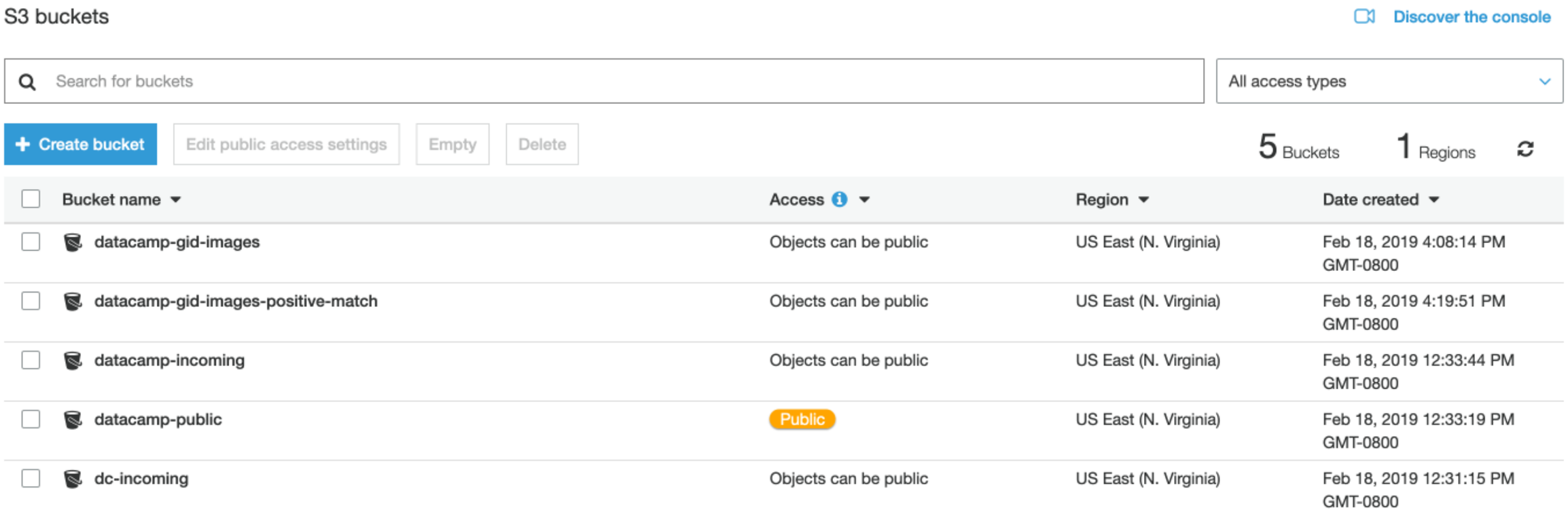
```
import boto3
s3 = boto3.client('s3', region_name='us-east-1',
                        aws_access_key_id=AWS_KEY_ID,
                        aws_secret_access_key=AWS_SECRET)
```

Delete Bucket

```
response = s3.delete_bucket('gid-requests')
```

Bye Bye Bucket

Bye Bye Bucket



Other operations

Client

class **`S3.Client`**

A low-level client representing Amazon Simple Storage Service (S3):

```
import boto3

client = boto3.client('s3')
```

These are the available methods:

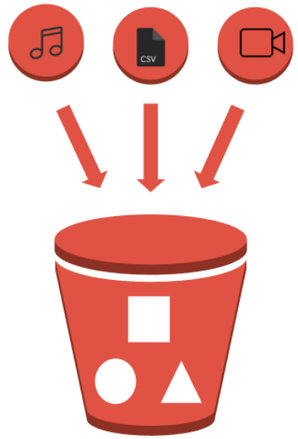
- **`abort_multipart_upload()`**
- **`can_paginate()`**
- **`complete_multipart_upload()`**

Summary

```
s3.create_bucket(Bucket='buck')

s3.list_buckets()

s3.delete_bucket(Bucket='buck')
```



Let's practice!

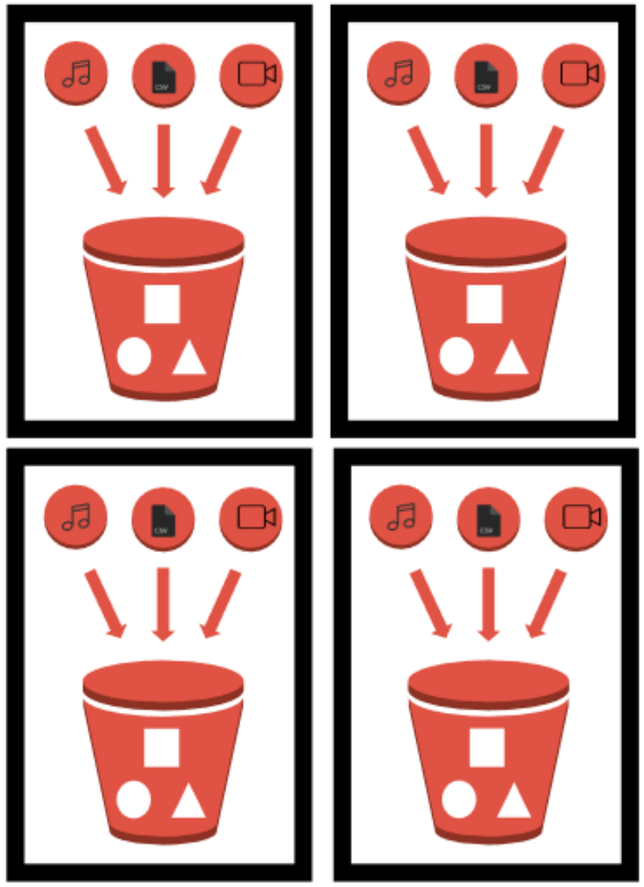
INTRODUCTION TO AWS BOTO IN PYTHON

Uploading and retrieving files

INTRODUCTION TO AWS BOTO IN PYTHON

Maksim Pecherskiy
Data engineer

Buckets and objects



A Bucket

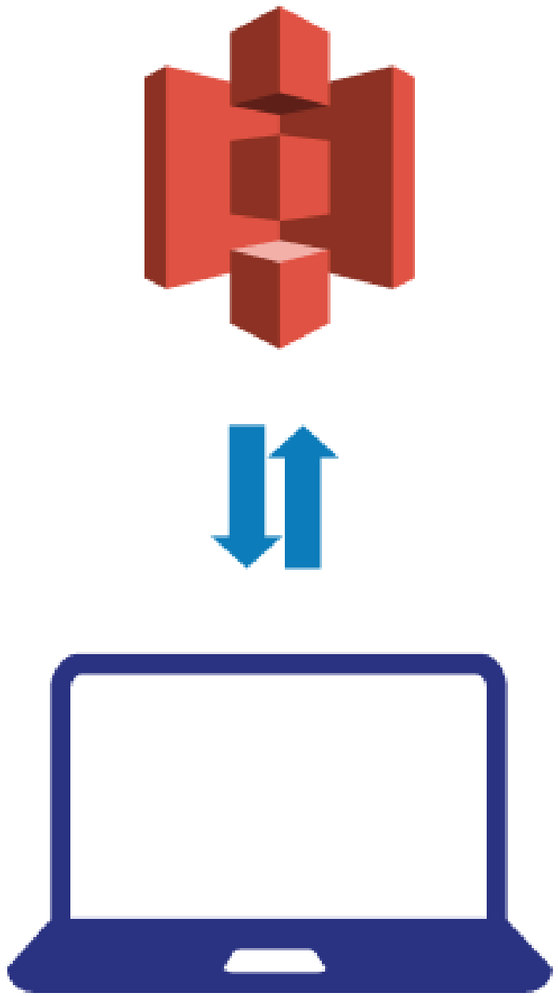
- A bucket has a **name**
- **Name** is a string
- **Unique** name in all of S3.
- Contains **many** objects

An Object

- An object has a **key**
- **Name** is full path from bucket root
- **Unique** key in the bucket
- Can only be in **one** parent bucket

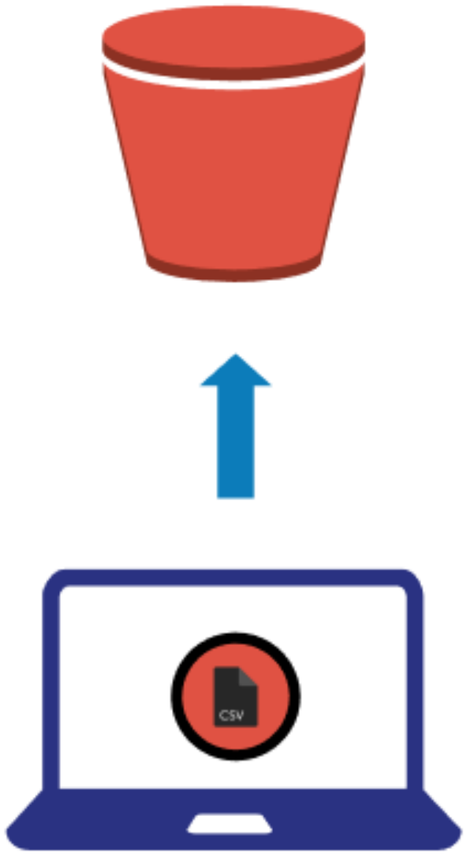
Creating the client

```
s3 = boto3.client(
  's3',
  region_name='us-east-1',
  aws_access_key_id=AWS_KEY_ID,
  aws_secret_access_key=AWS_SECRET
)
```

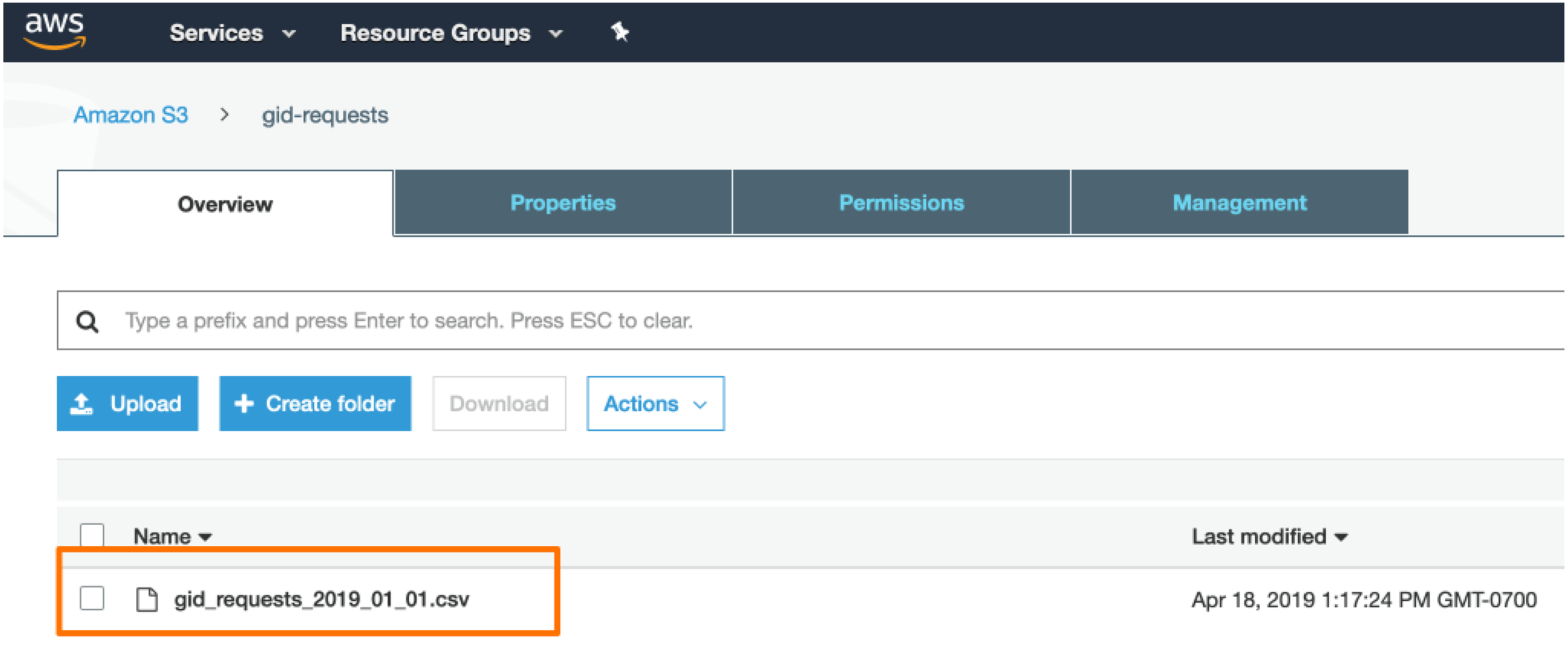


Uploading files

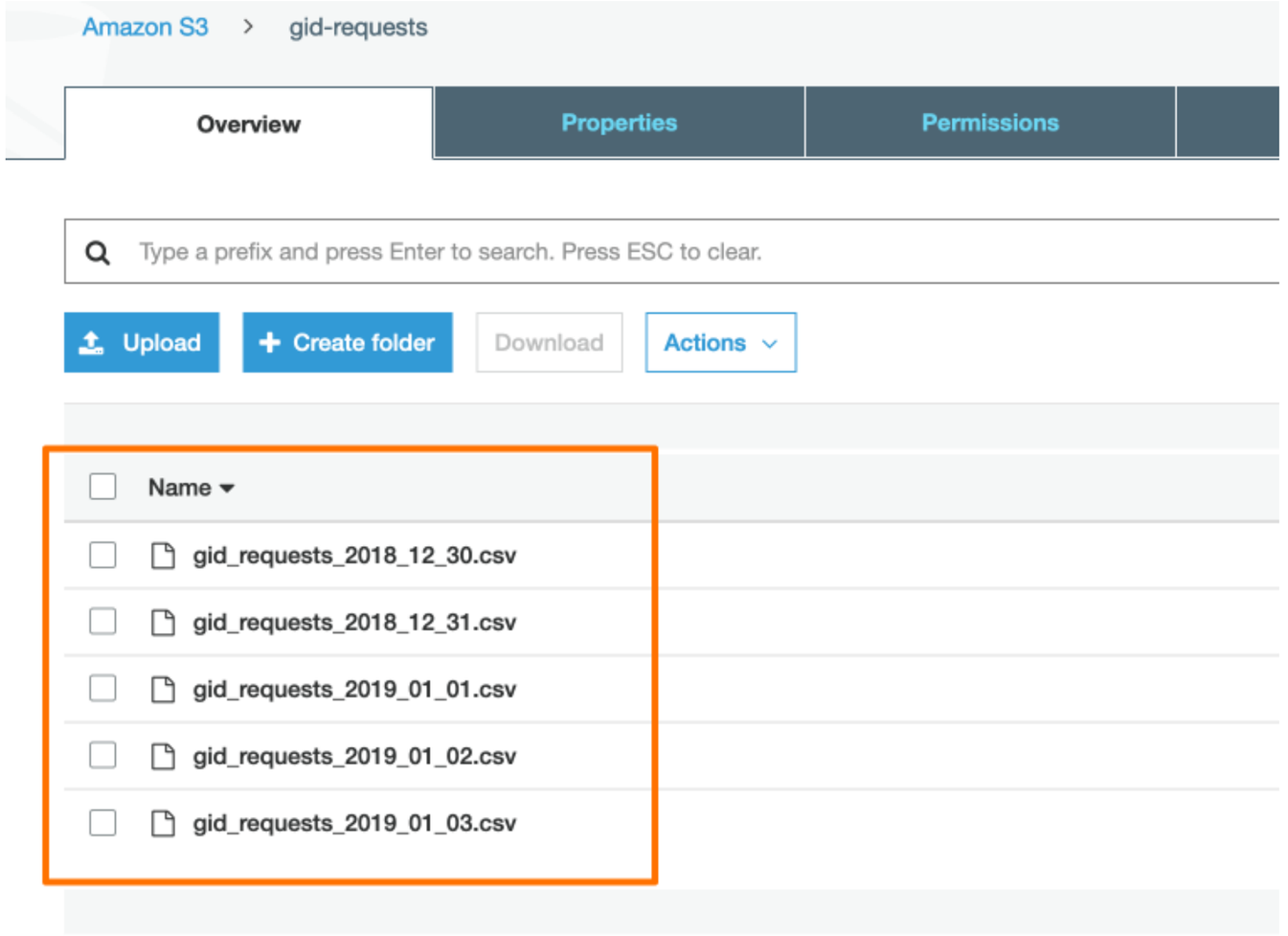
```
s3.upload_file(
  Filename='gid_requests_2019_01_01.csv',
  Bucket='gid-requests',
  Key='gid_requests_2019_01_01.csv')
```



Uploading files



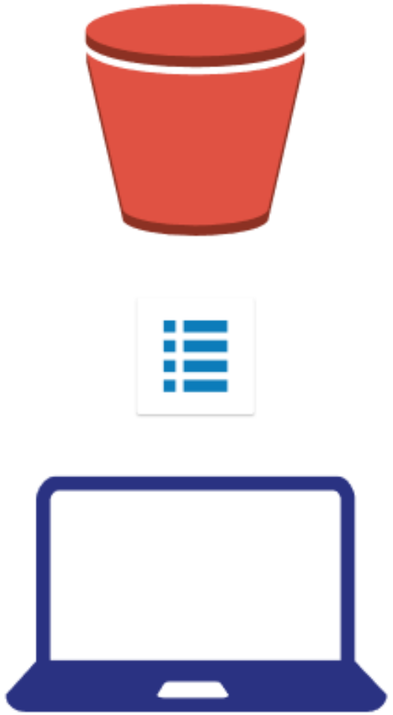
Uploading more objects



Listing objects in a bucket

```
response = s3.list_objects(
  Bucket='gid-requests',
  MaxKeys=2,
  Prefix='gid_requests_2019_')

print(response)
```



Listing objects in a bucket

```
'Contents': [{'Key': 'gid_requests_2018_12_30.csv',
   'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 30, tzinfo=tzutc()),
   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
   'Size': 57137,
   'StorageClass': 'STANDARD',
   'Owner': {'DisplayName': 'maksim+aws-demos',
    'ID': '12346cf1b2f0e923b64d624ce166bb570c6dae4a2a905b419916bd365ea5a596'}},
  {'Key': 'gid_requests_2018_12_31.csv',
   'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 27, tzinfo=tzutc()),
   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
```

Listing objects in a bucket

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   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
```

Listing objects in a bucket

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  {'Key': 'gid_requests_2018_12_31.csv',
   'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 27, tzinfo=tzutc()),
   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
```
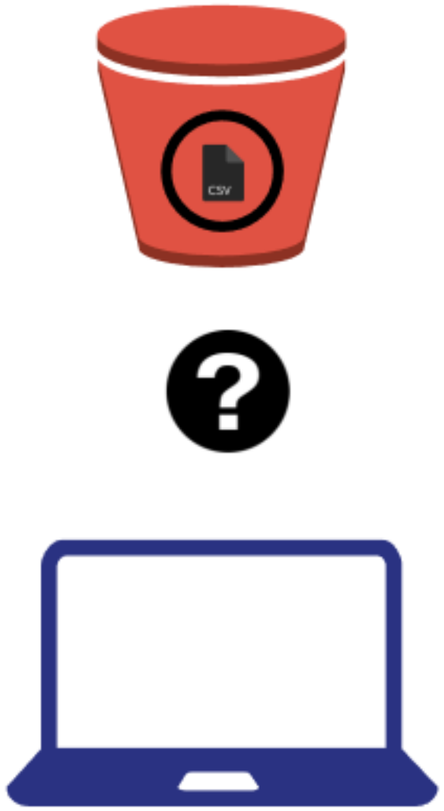

Getting object metadata

```
response = s3.head_object(
  Bucket='gid-requests',
  Key='gid_requests_2018_12_30.csv')

print(response)
```

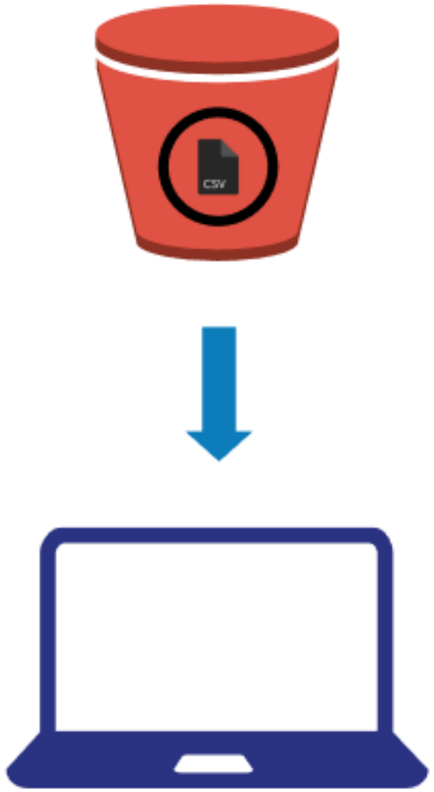


Getting object metadata

```
{'ResponseMetadata': {'RequestId': '27FB1088203DD28E',
  'HostId': '',
  'HTTPStatusCode': 200,
  'RetryAttempts': 0},
 'AcceptRanges': 'bytes',
 'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 30, tzinfo=tzutc()),
 'ContentLength': 57137,
 'ETag': '"2ffc551dccadb18aba921c2d88501325"',
 'ContentType': 'binary/octet-stream',
 'Metadata': {}}
```

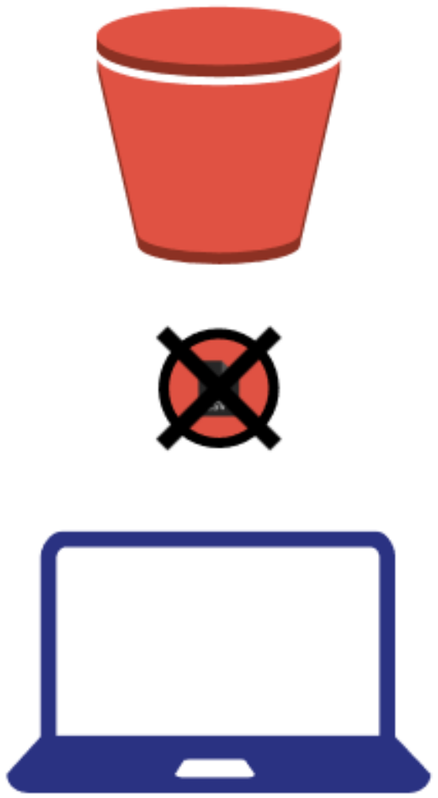
Downloading files

```
s3.download_file(
  Filename='gid_requests_downed.csv',
  Bucket='gid-requests',
  Key='gid_requests_2018_12_30.csv')
```



Deleting objects

```
s3.delete_object(
  Bucket='gid-requests',
  Key='gid_requests_2018_12_30.csv')
```



Summary

- Buckets are like folders
- Objects are like files
- `boto3.client()`
- `s3.upload_file()`
- `s3.list_objects()`
- `s3.head_object()`
- `s3.download_file()`
- `s3.delete_object()`

Let's make some objects!

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