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

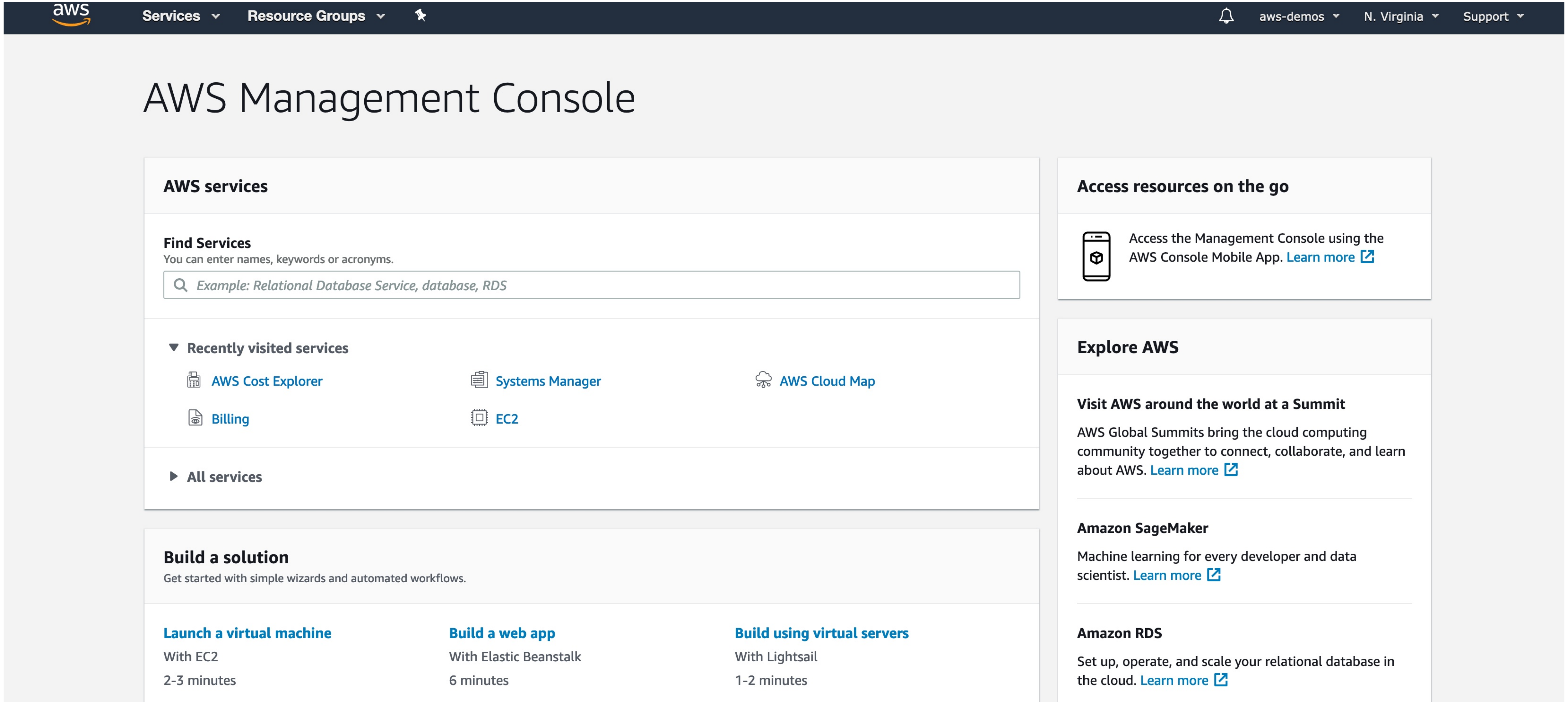
What is Boto3?

```python
import boto3
```

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

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

AWS console



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
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

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

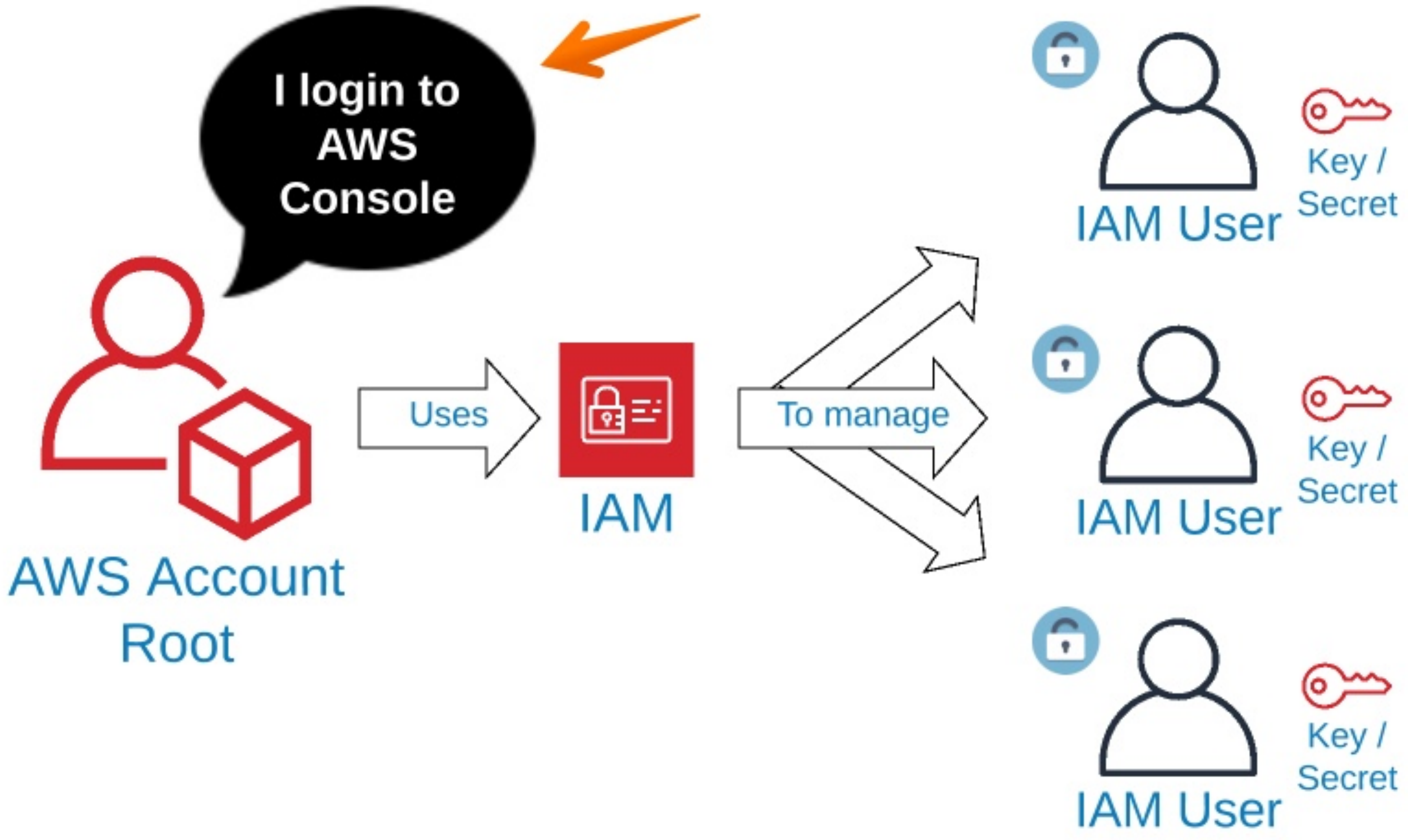
Amazon SageMaker

Machine learning for every developer and data scientist. Learn more

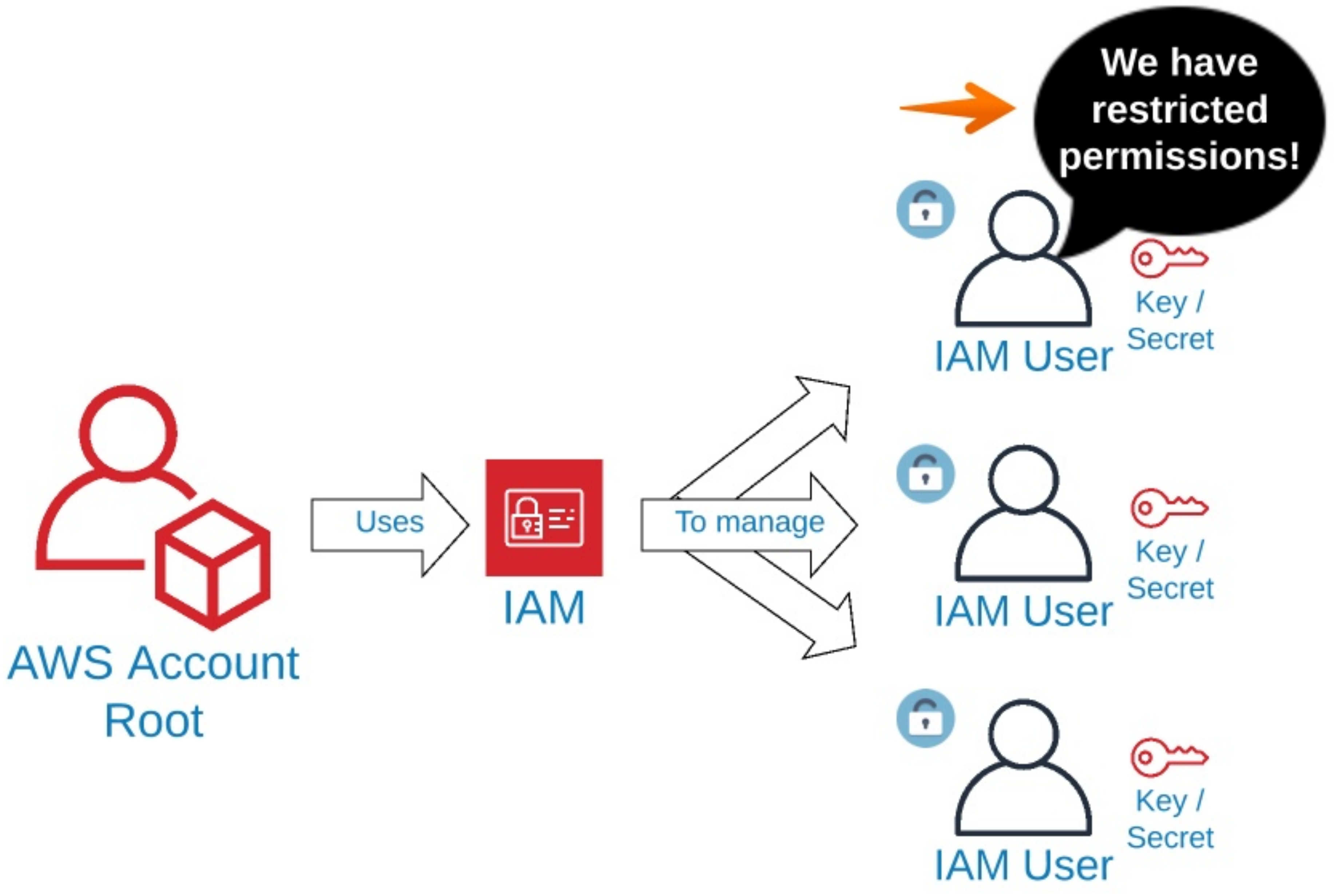
Amazon RDS

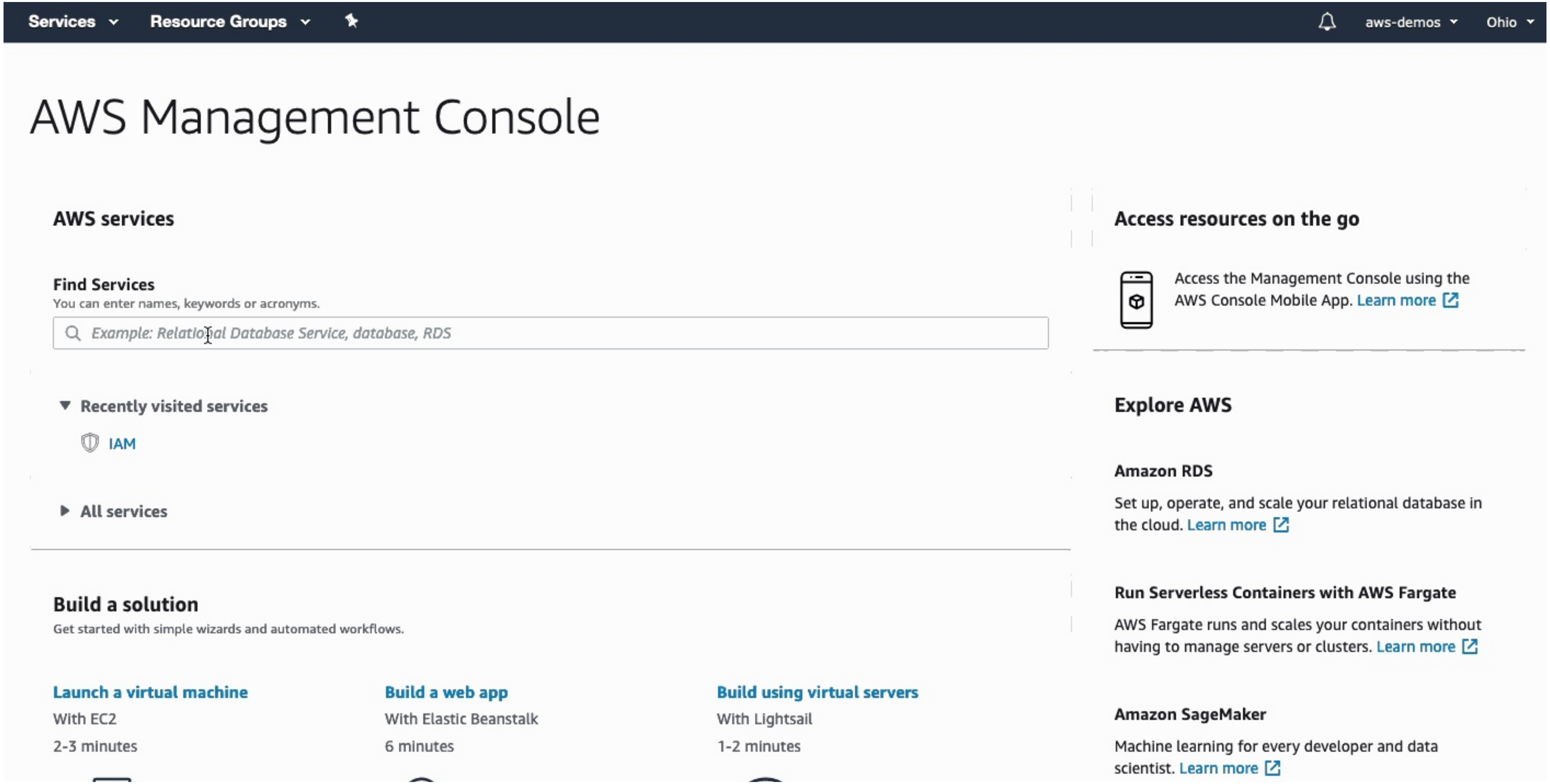
Set up, operate, and scale your relational database in the cloud. Learn more

Creating keys with IAM.



Creating keys with IAM




Services | Resource Groups | aws-demos | Ohio

AWS Management Console

AWS services

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IAM

▶ All services

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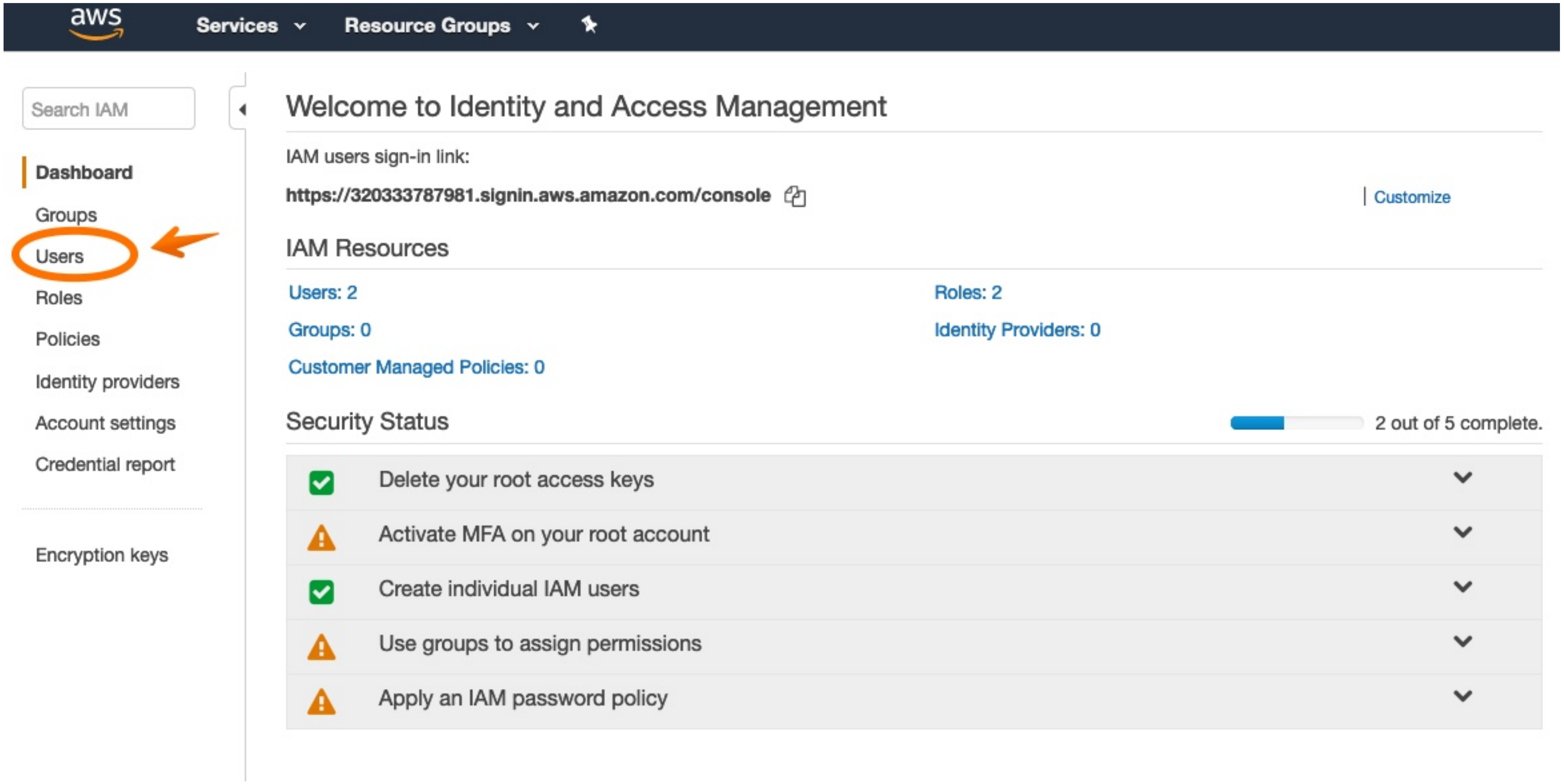
Run Serverless Containers with AWS Fargate
AWS Fargate runs and scales your containers without having to manage servers or clusters. Learn more

Amazon SageMaker
Machine learning for every developer and data scientist. Learn more



Welcome to Identity and Access Management

IAM users sign-in link:

https://320333787981.signin.aws.amazon.com/console

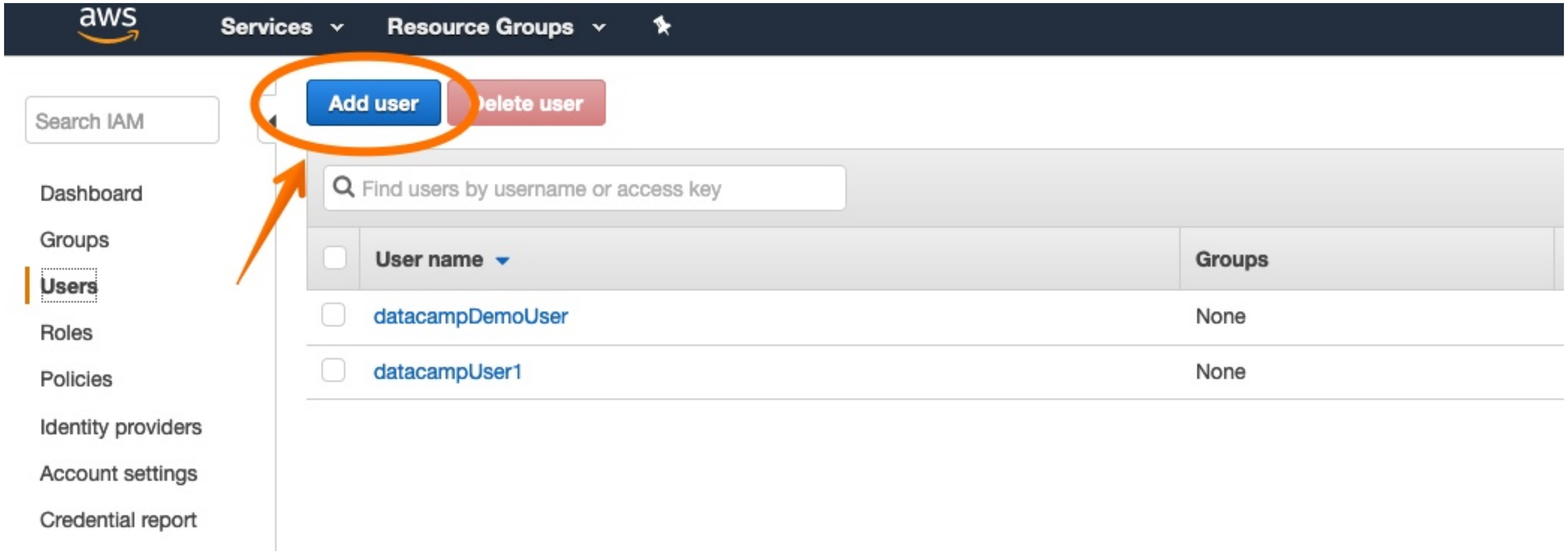
IAM Resources

Users: 2
Roles: 2
Groups: 0
Identity Providers: 0
Customer Managed Policies: 0

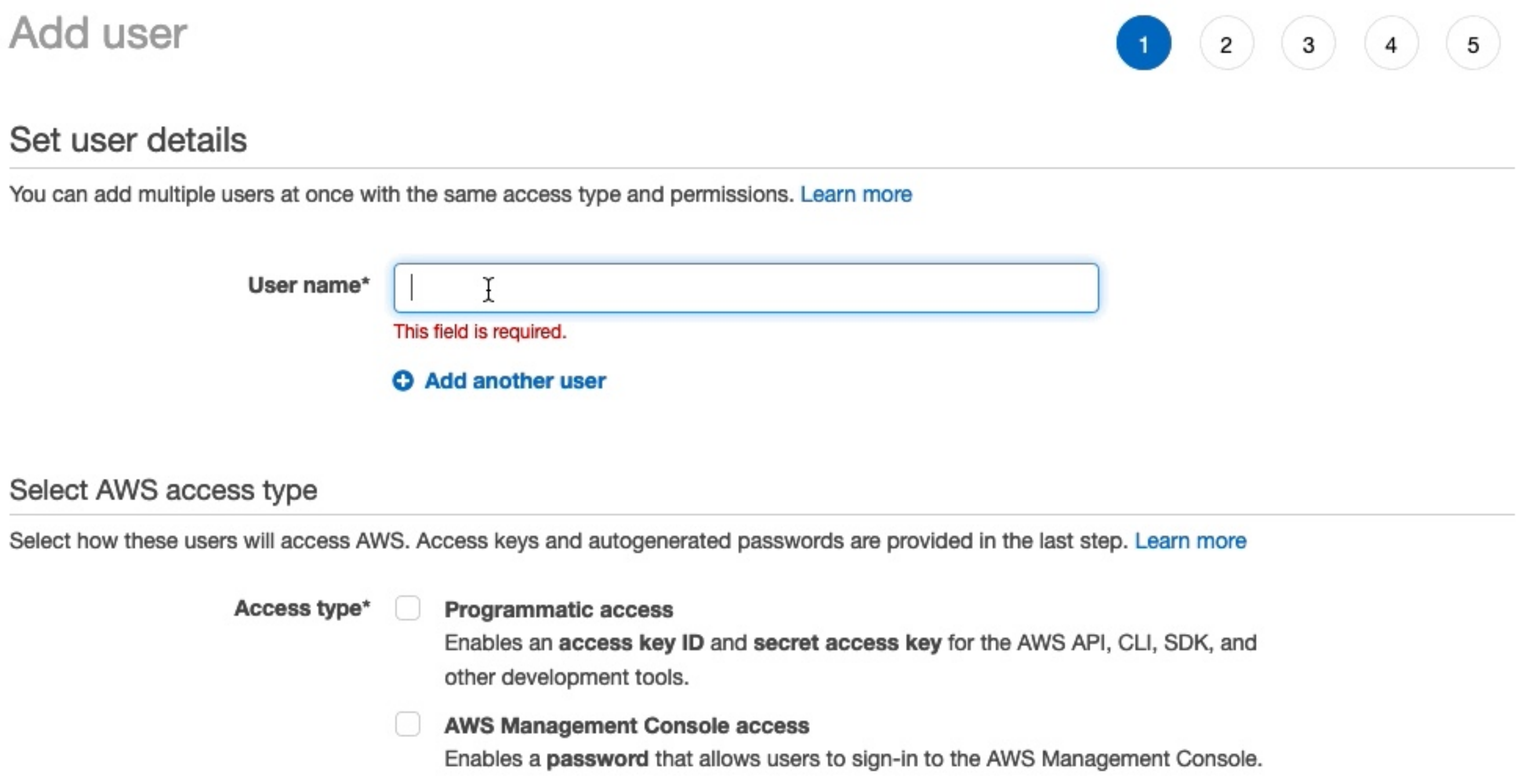
Security Status

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



User name	Groups
datacampDemoUser	None
datacampUser1	None



Add user

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.

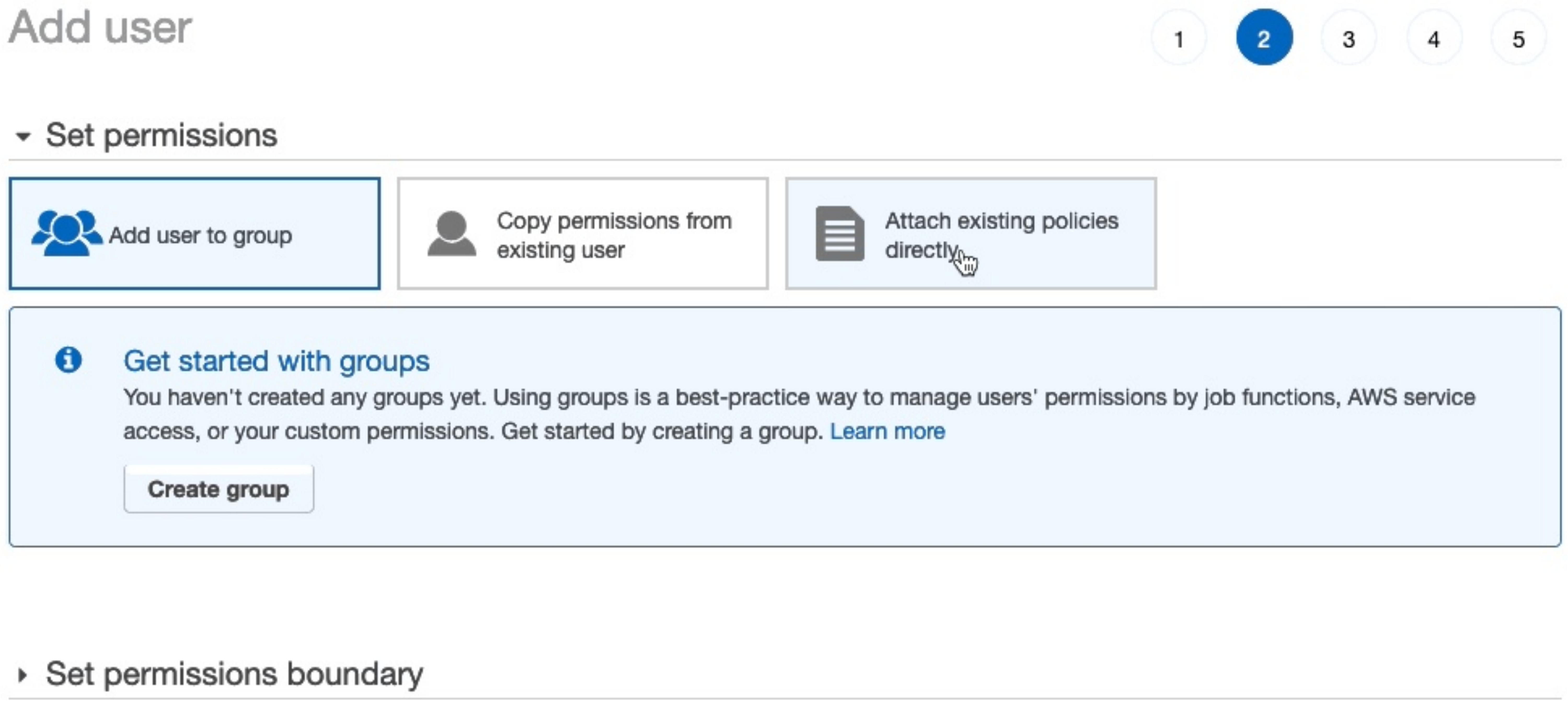
Add another user

Select AWS access type

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

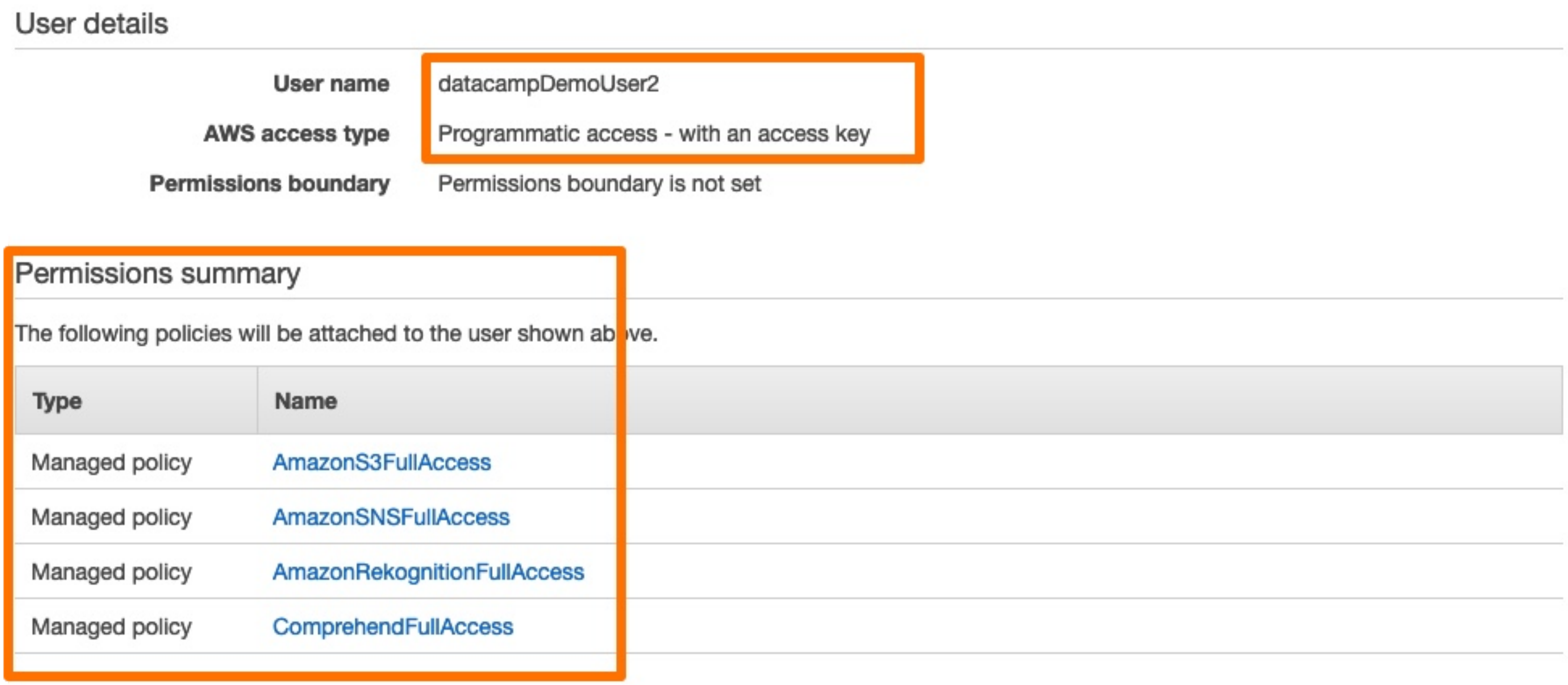
Access type*

- [ ] **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



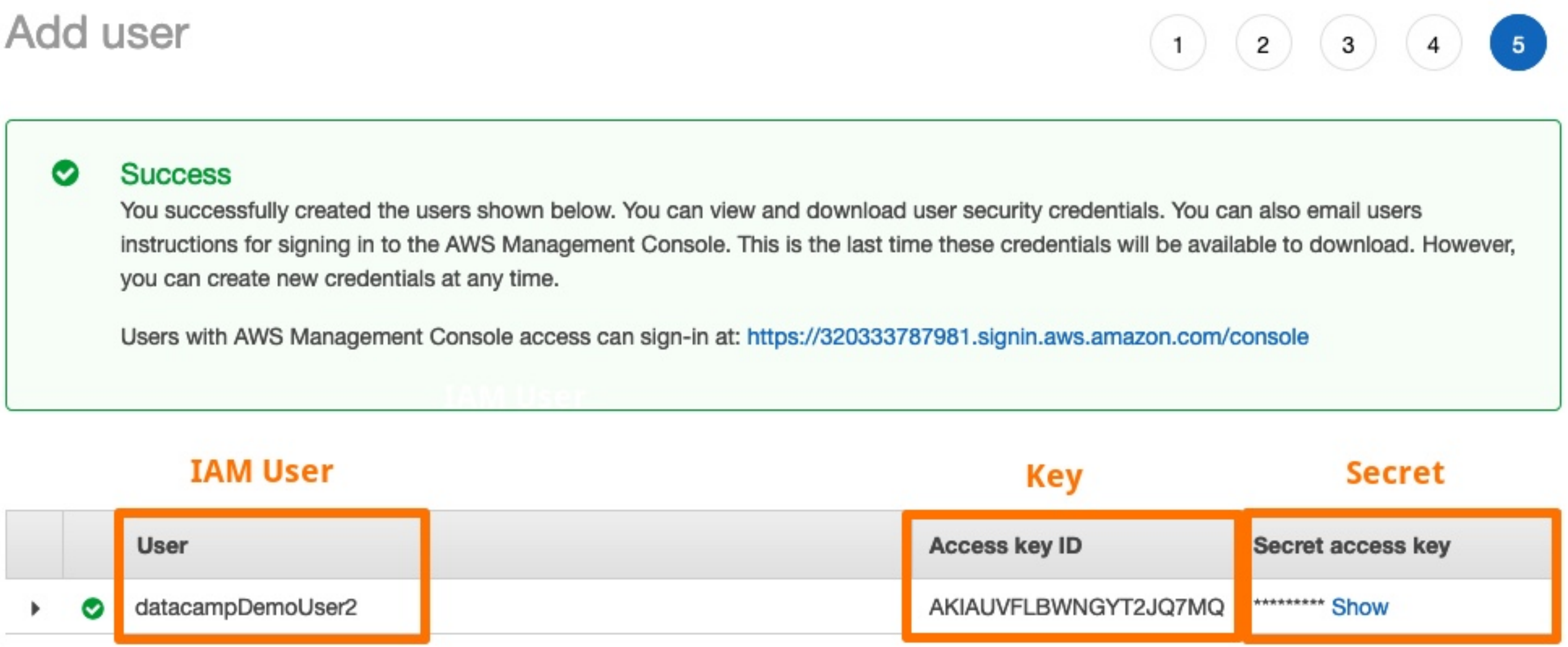
User details

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 above.

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



Add user

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

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

AWS services

AWS services

AWS services

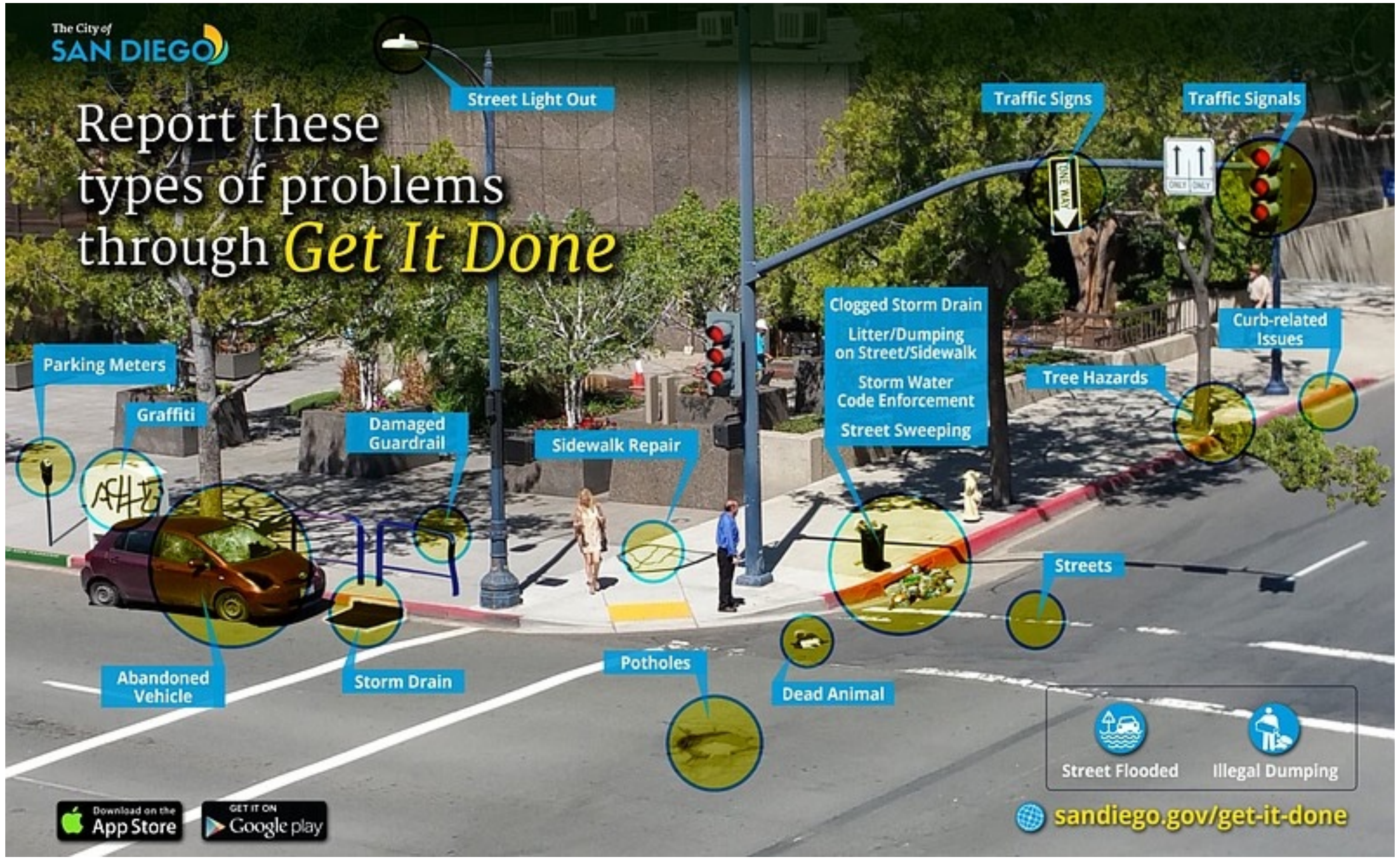
AWS services

AWS services

IAM
S3
SNS
Comprehend
Rekognition

Sam

GetItDone



[1] https://data.sandiego.gov/datasets/get-it-done-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

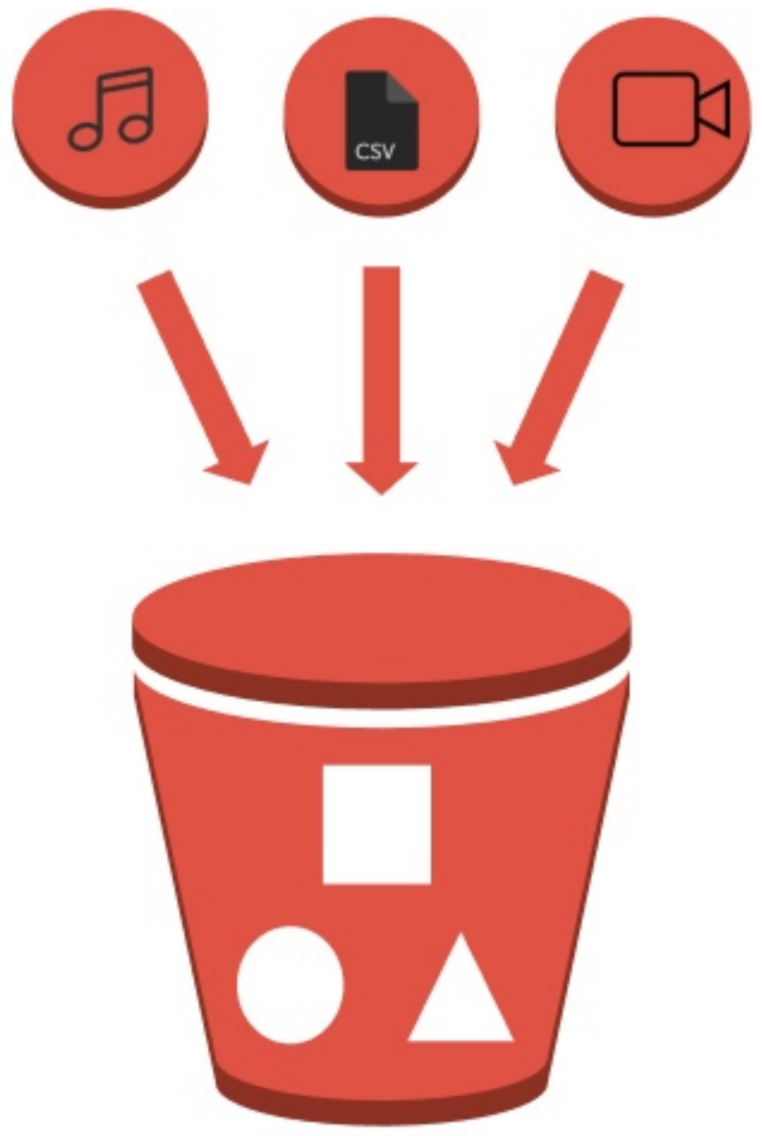
Maksim Pecherskiy
Data Engineer

datacamp

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

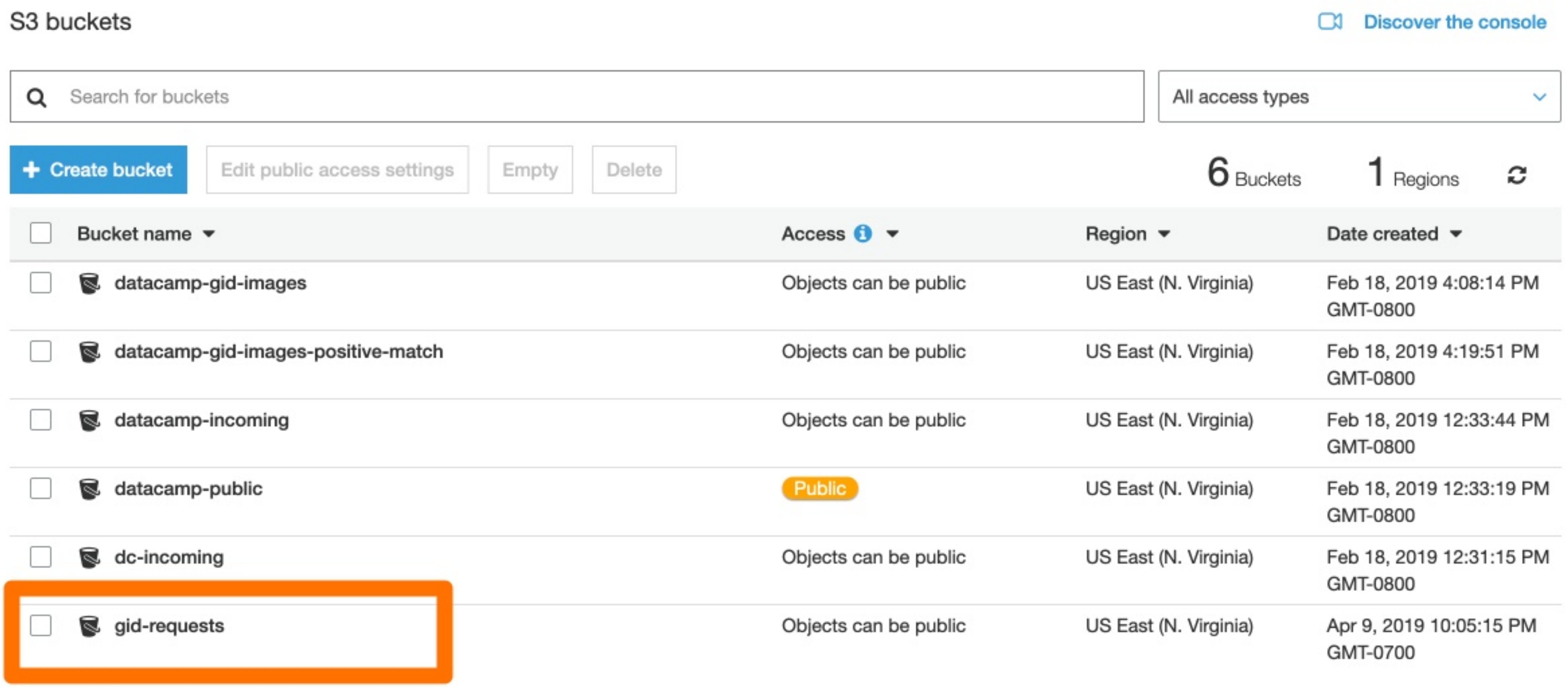
```
import boto3
s3 = boto3.client('s3', region_name='us-east-1',
                         aws_access_key_id=AWS_KEY_ID,
                         aws_secret_access_key=AWS_SECRET)
```

Create bucket!

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

Bang!

Our bucket in the console


S3 buckets

Discover the console

Search for buckets | All access types

Create bucket | Edit public access settings | Empty | Delete

6 Buckets 1 Regions

Bucket name	Access	Region	Date created
datacamp-gid-images	Objects can be public	US East (N. Virginia)	Feb 18, 2019 4:08:14 PM GMT-0800
datacamp-gid-images-positive-match	Objects can be public	US East (N. Virginia)	Feb 18, 2019 4:19:51 PM GMT-0800
datacamp-incoming	Objects can be public	US East (N. Virginia)	Feb 18, 2019 12:33:44 PM GMT-0800
datacamp-public	Public	US East (N. Virginia)	Feb 18, 2019 12:33:19 PM GMT-0800
dc-incoming	Objects can be public	US East (N. Virginia)	Feb 18, 2019 12:31:15 PM GMT-0800
gid-requests	Objects can be public	US East (N. Virginia)	Apr 9, 2019 10:05:15 PM GMT-0700

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

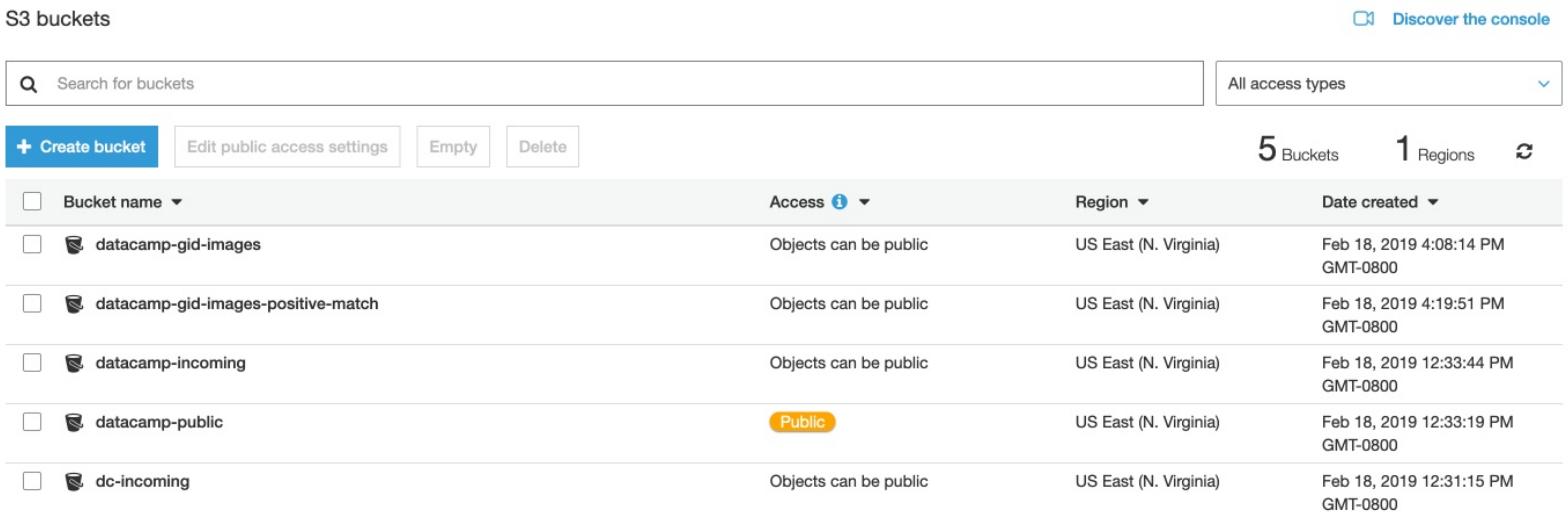
```
import boto3
s3 = boto3.client('s3', region_name='us-east-1',
                         aws_access_key_id=AWS_KEY_ID,
                        aws_secret_access_key=AWS_SECRET)
```

Delete Bucket

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

Bye Bye Bucket

Bye Bye Bucket



	Bucket name	Access	Region	Date created
☐	datacamp-gid-images	Objects can be public	US East (N. Virginia)	Feb 18, 2019 4:08:14 PM GMT-0800
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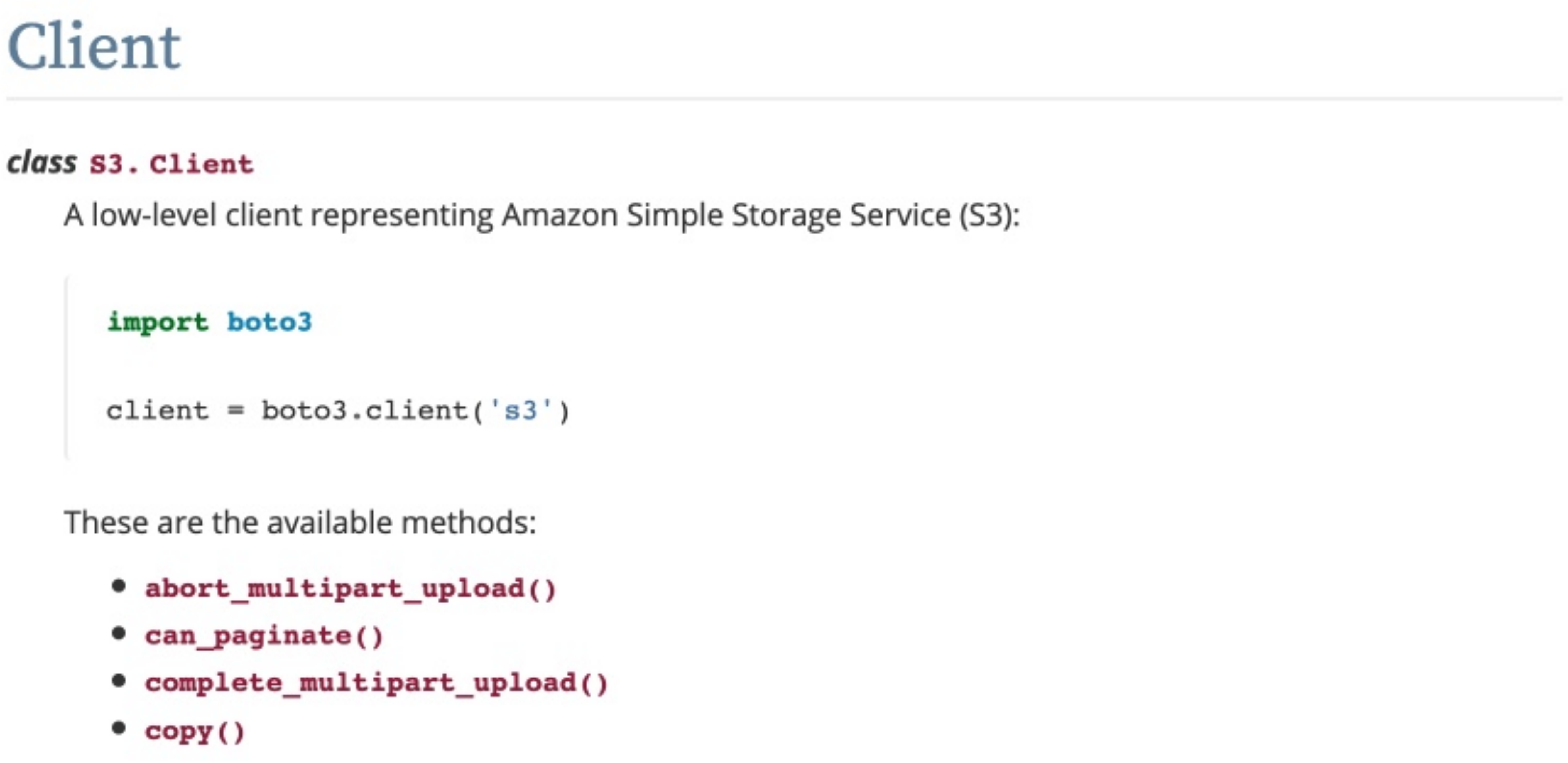
☐	datacamp-public	Public	US East (N. Virginia)	Feb 18, 2019 12:33:19 PM GMT-0800
☐	dc-incoming	Objects can be public	US East (N. Virginia)	Feb 18, 2019 12:31:15 PM GMT-0800

Other operations



Client

class **S3.Client**

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

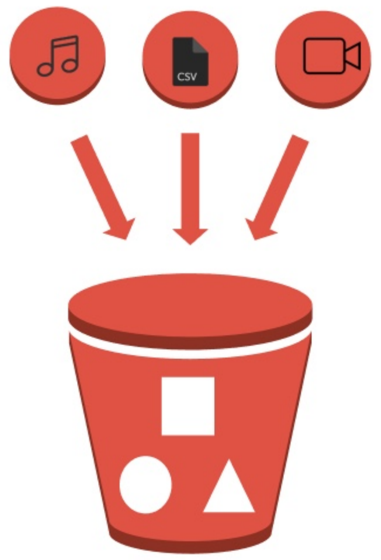
```
import boto3

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

These are the available methods:

- **abort_multipart_upload()**
- **can_paginate()**
- **complete_multipart_upload()**
- **copy()**

Summary

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



Let's practice!

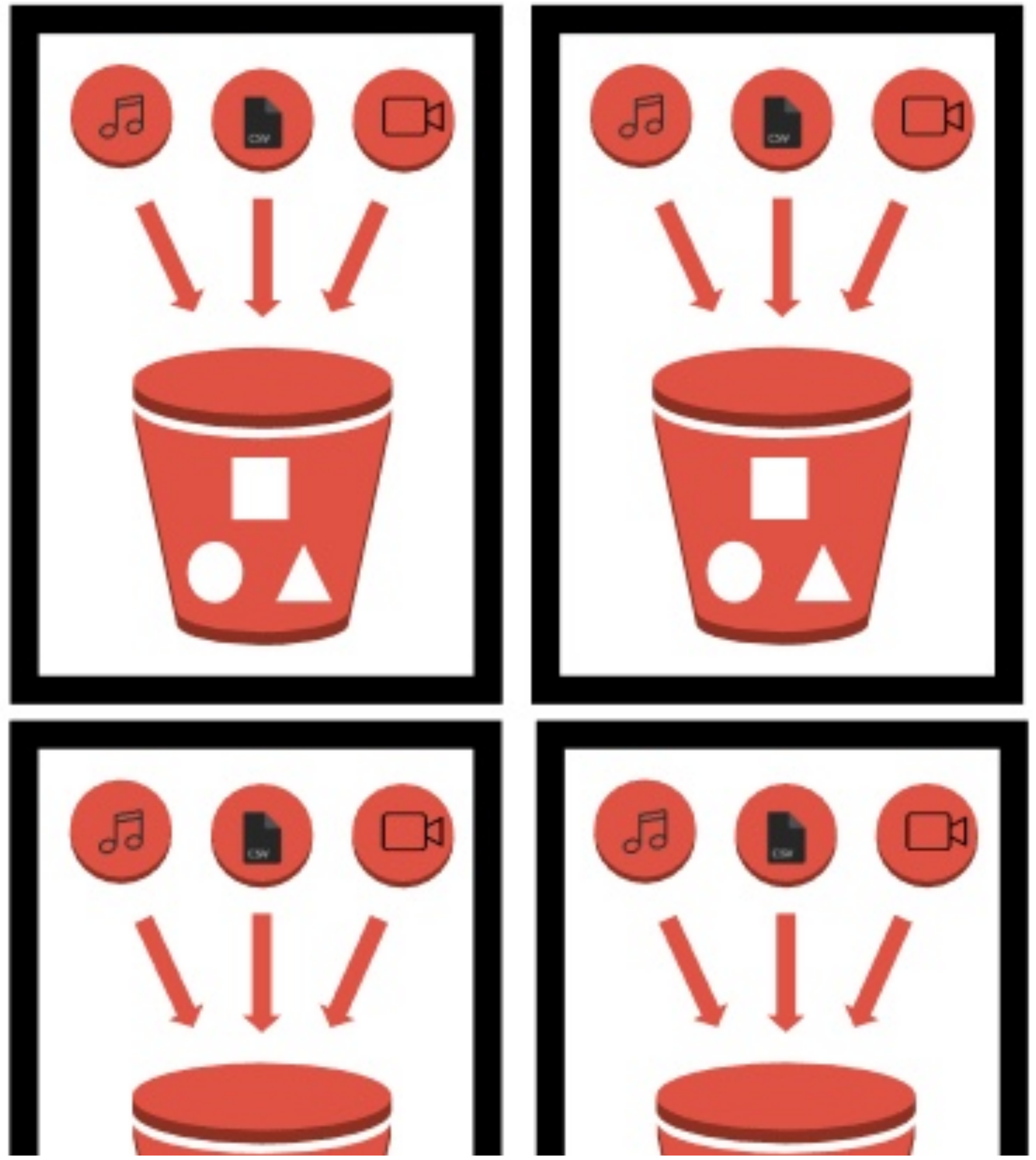
INTRODUCTION TO AWS BOTO IN PYTHON

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

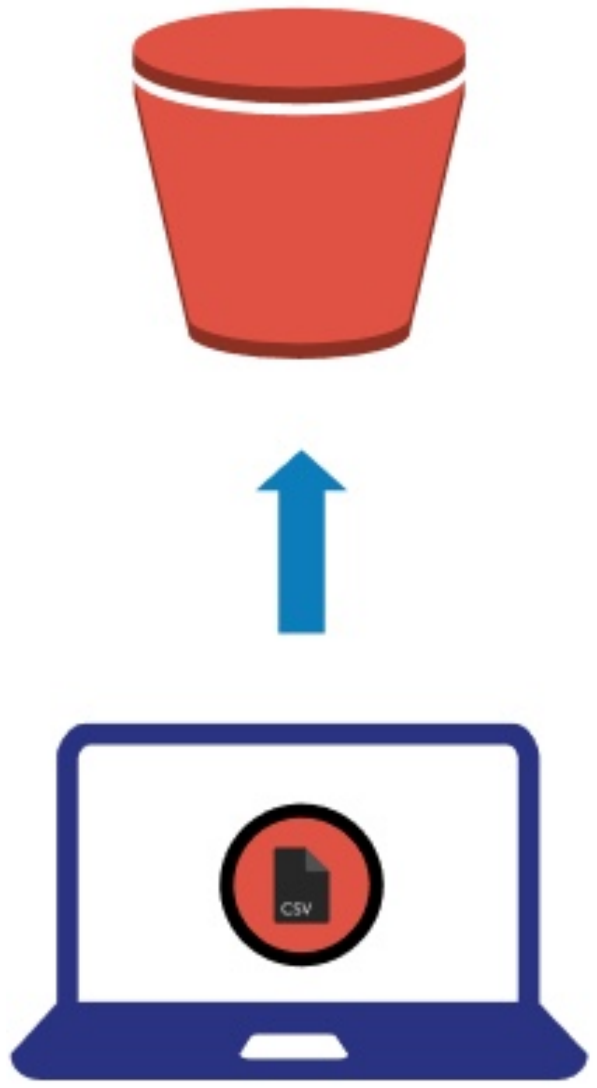
- An object has a **key**
- **Name** is full path from bucket root
- **Unique** key in the bucket
- Can only be in **one** parent bucket

Creating the client

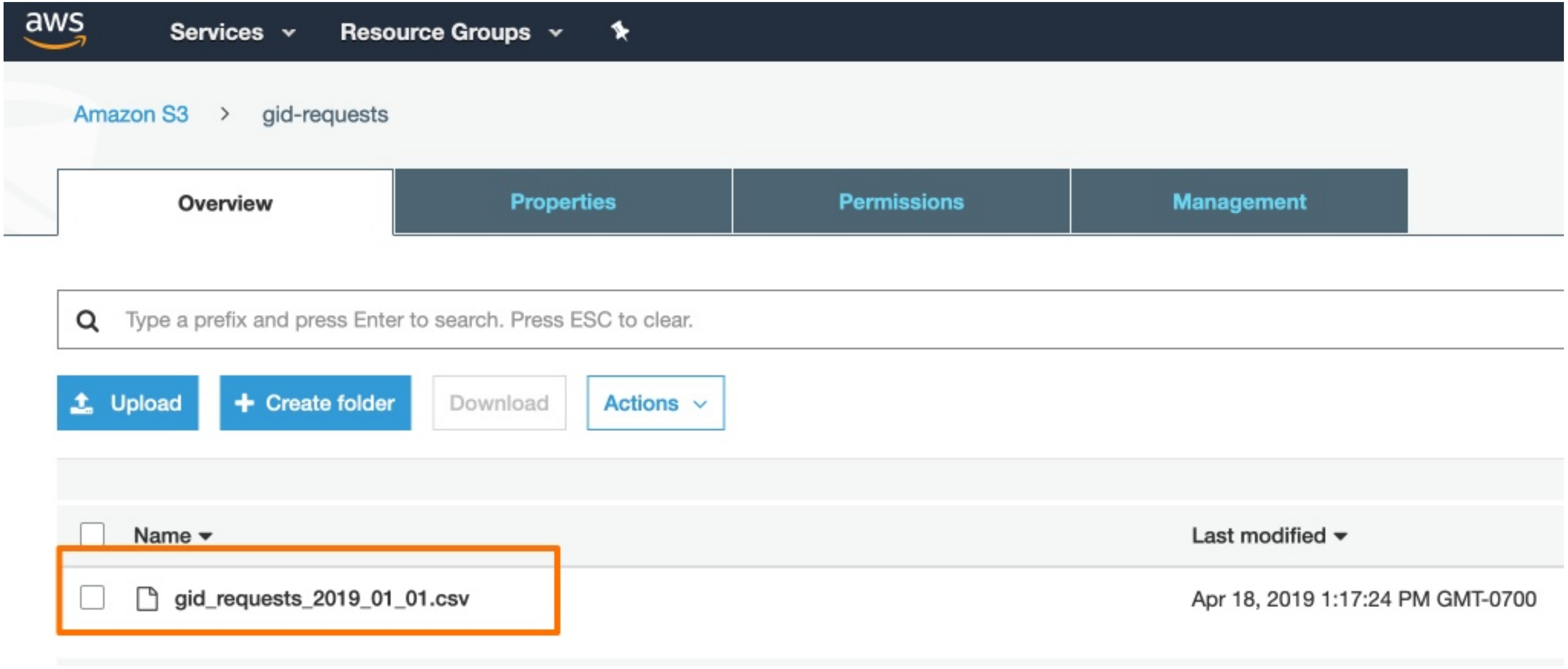
```
s3 = boto3.client(
  's3',
  region_name='us-east-1',
  aws_access_key_id=AWS_KEY_ID,
  aws_secret_access_key=AWS_SECRET
)
```

Uploading files

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

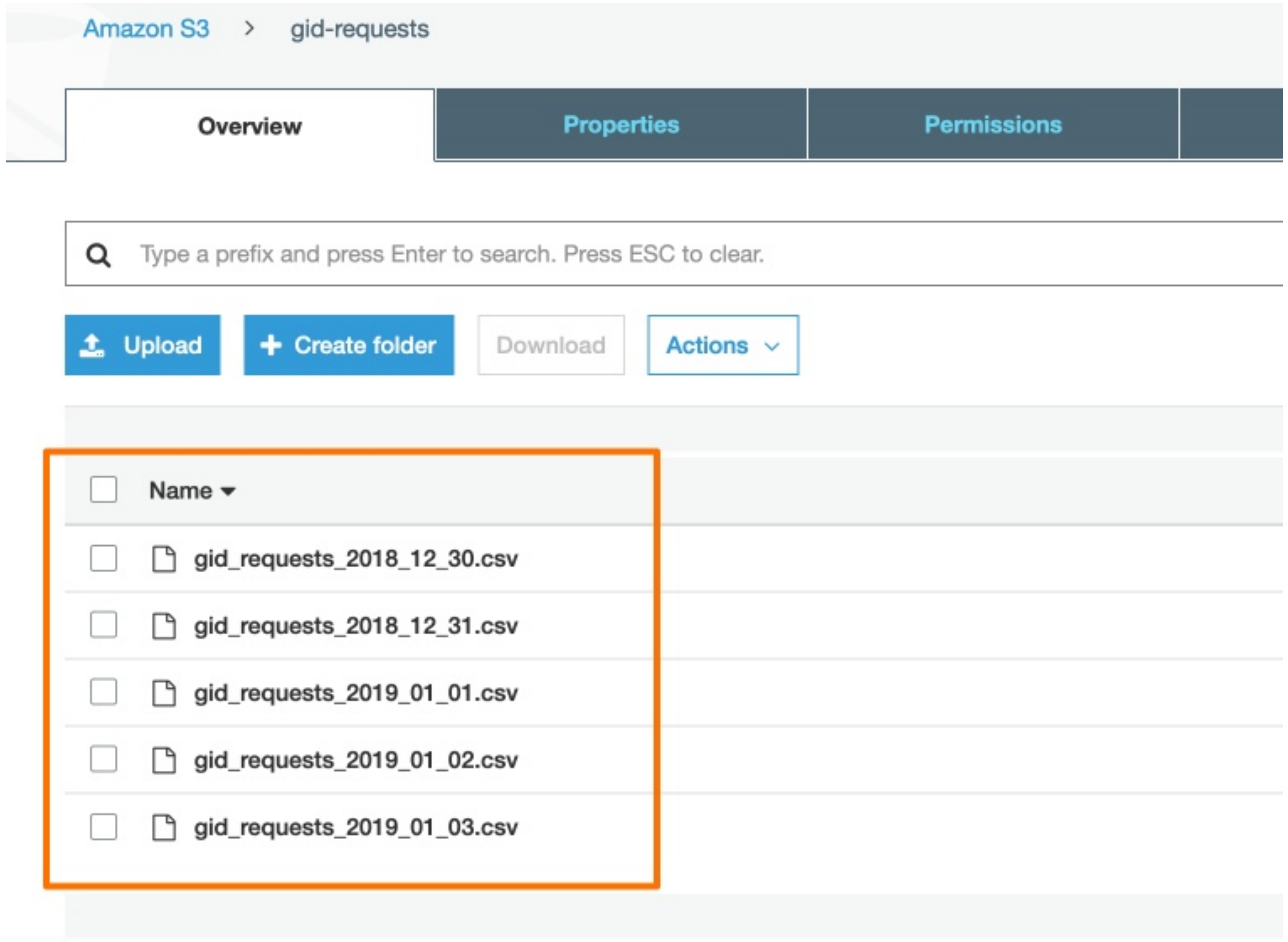


Uploading files



Name	Last modified
gid_requests_2019_01_01.csv	Apr 18, 2019 1:17:24 PM GMT-0700

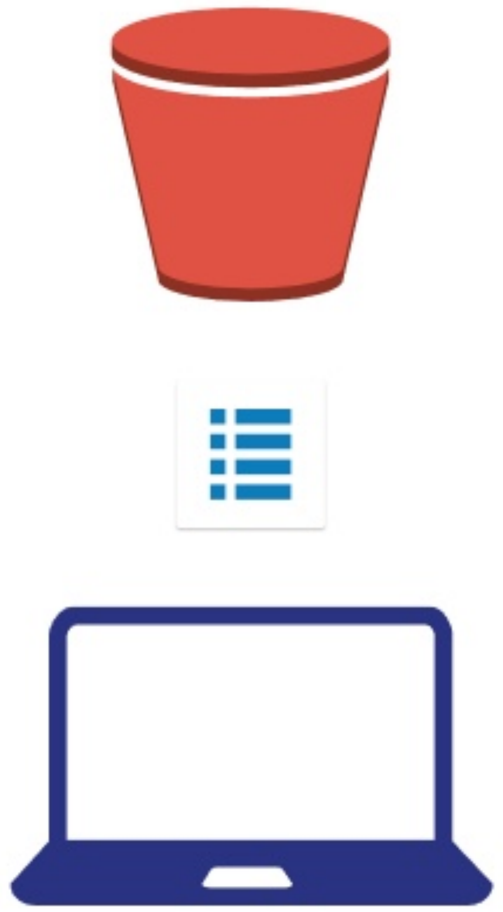
Uploading more objects



gid_requests_2018_12_30.csv
gid_requests_2018_12_31.csv
gid_requests_2019_01_01.csv
gid_requests_2019_01_02.csv
gid_requests_2019_01_03.csv

Listing objects in a bucket

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

print(response)
```



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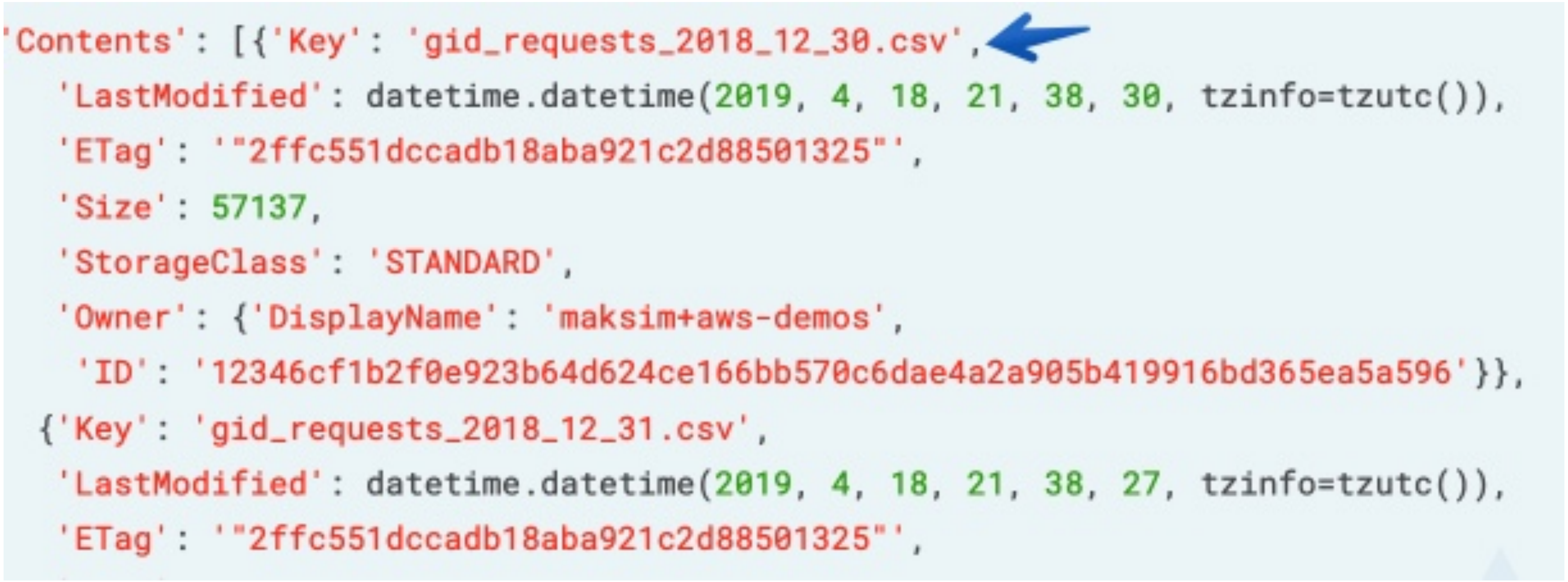
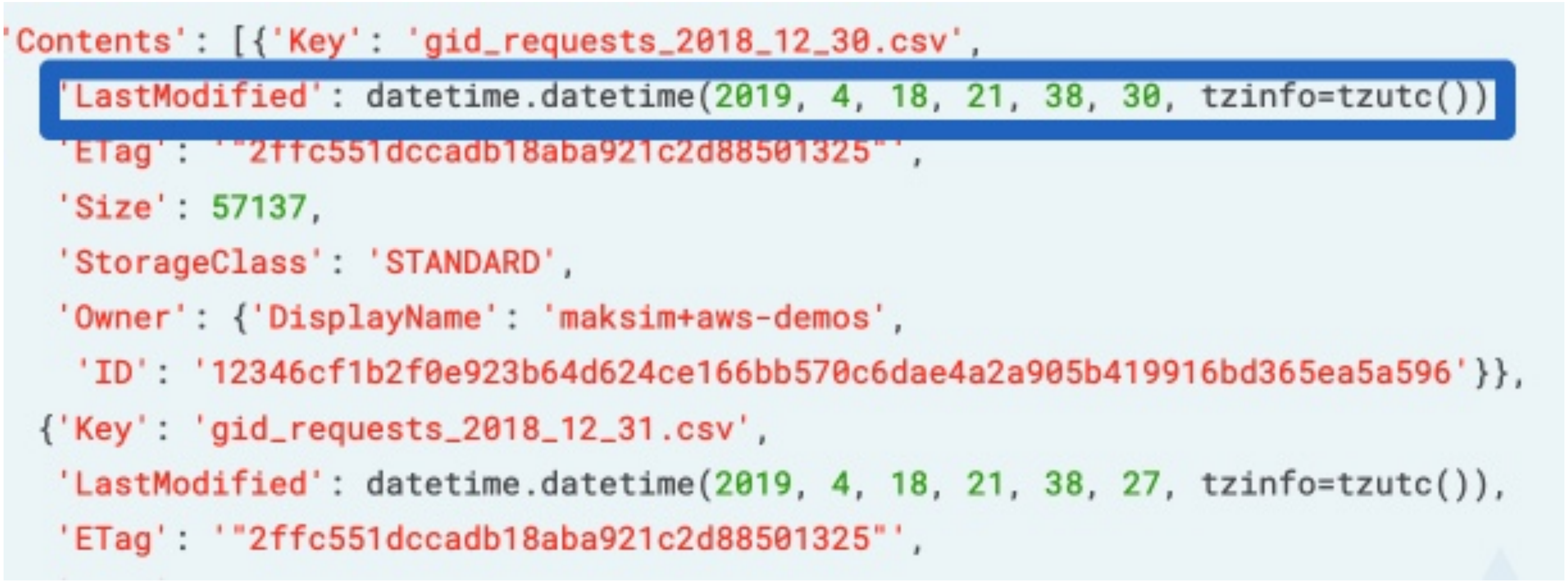


```
'Contents': [{'Key': 'gid_requests_2018_12_30.csv',
   'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 30, tzinfo=tzutc()),
   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
   'Size': 57137,
   'StorageClass': 'STANDARD',
   'Owner': {'DisplayName': 'maksim+aws-demos',
    'ID': '12346cf1b2f0e923b64d624ce166bb570c6dae4a2a905b419916bd365ea5a596'}},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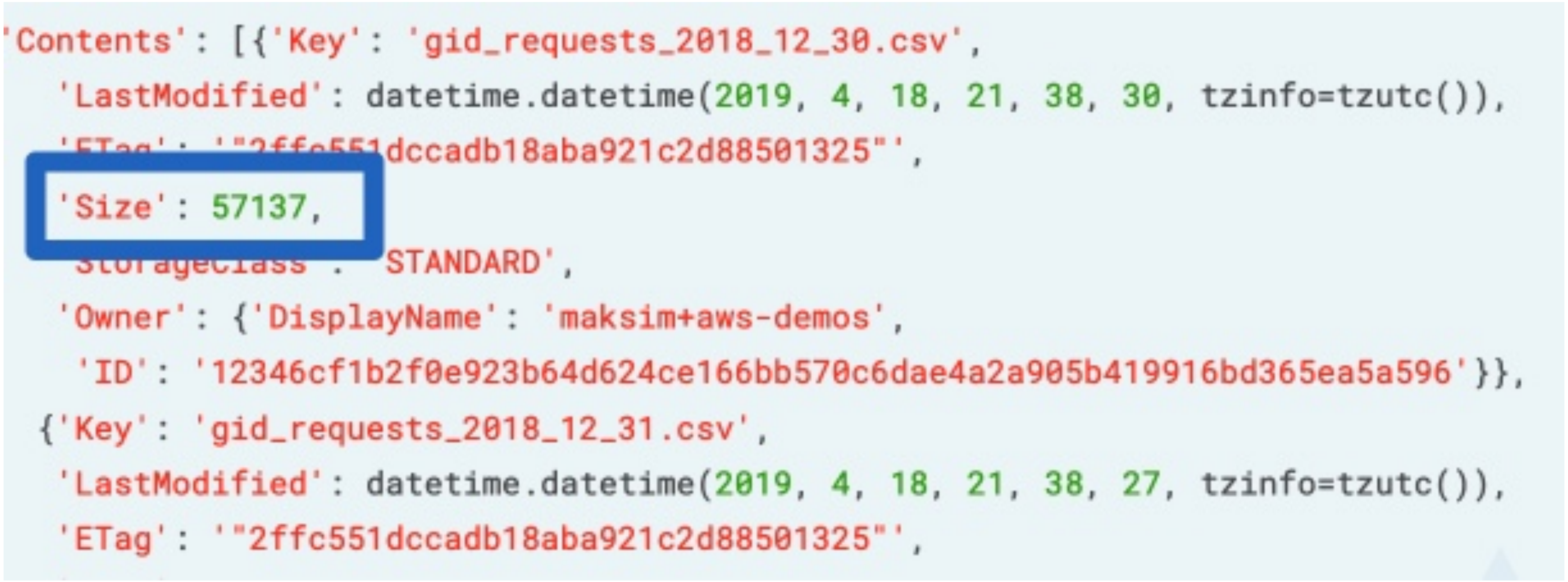

```
'Contents': [{'Key': 'gid_requests_2018_12_30.csv',
   'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 30, tzinfo=tzutc()),
   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
   'Size': 57137,
   'StorageClass': 'STANDARD',
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  {'Key': 'gid_requests_2018_12_31.csv',
   'LastModified': datetime.datetime(2019, 4, 18, 21, 38, 27, tzinfo=tzutc()),
   'ETag': '"2ffc551dccadb18aba921c2d88501325"',
```
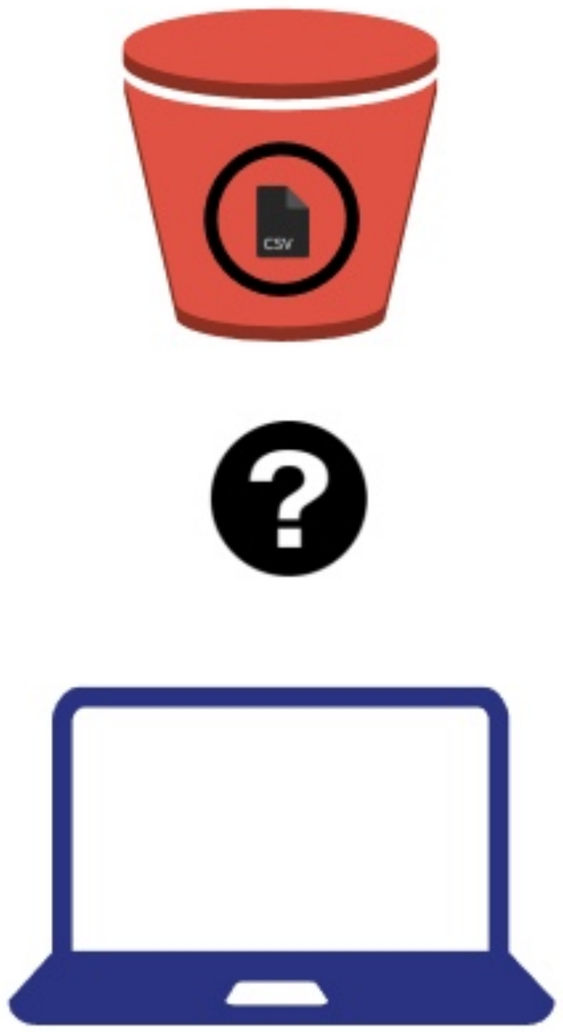
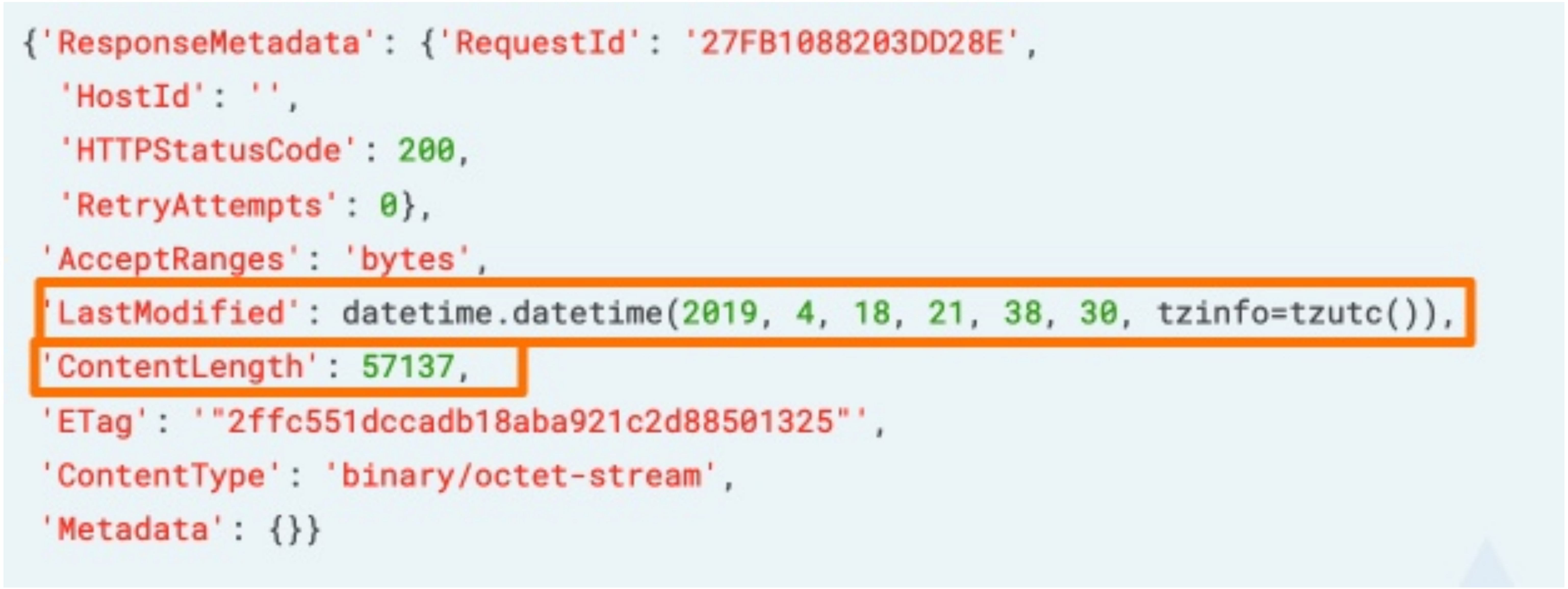

Getting object metadata

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

print(response)
```



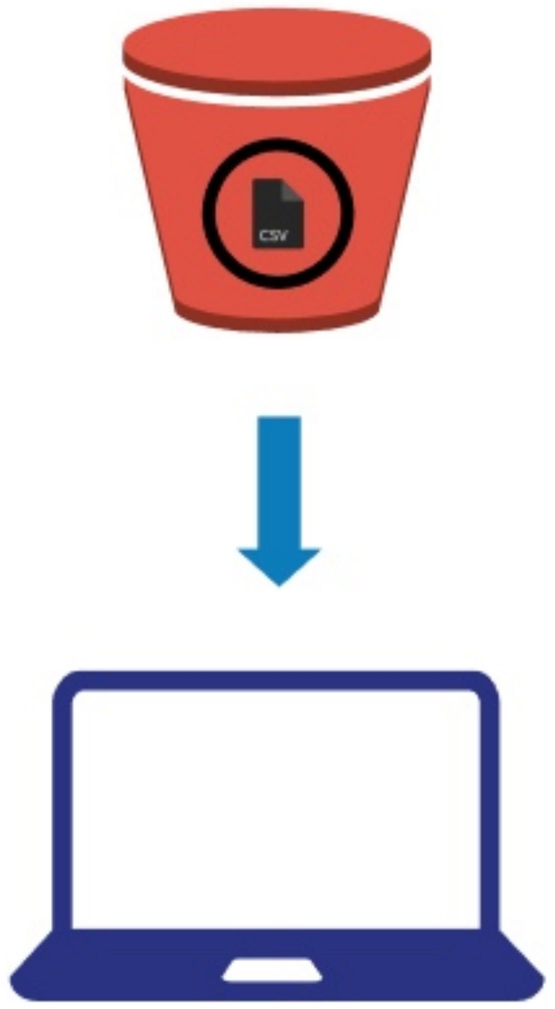
Getting object metadata



```
{'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': {}}
```

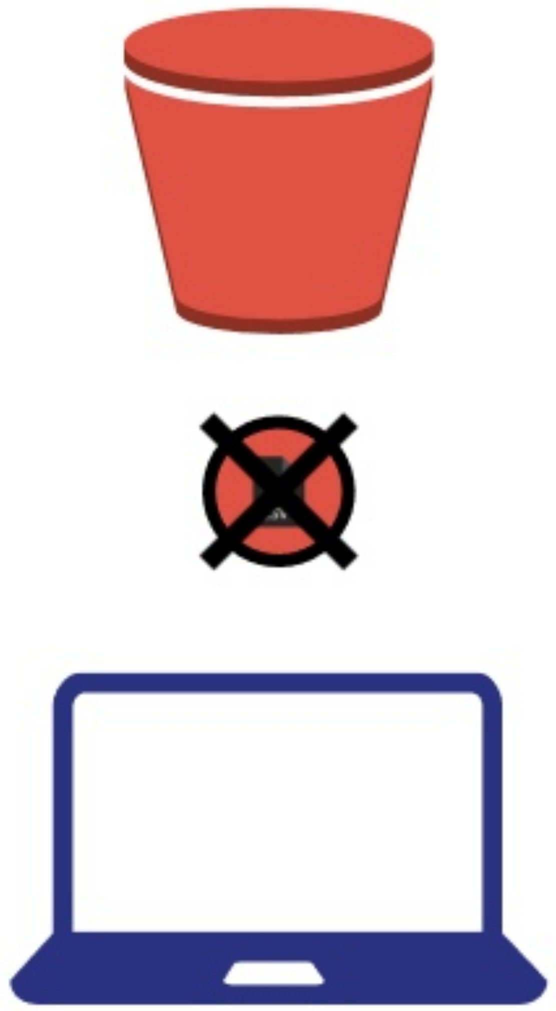
Downloading files

```python
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!