

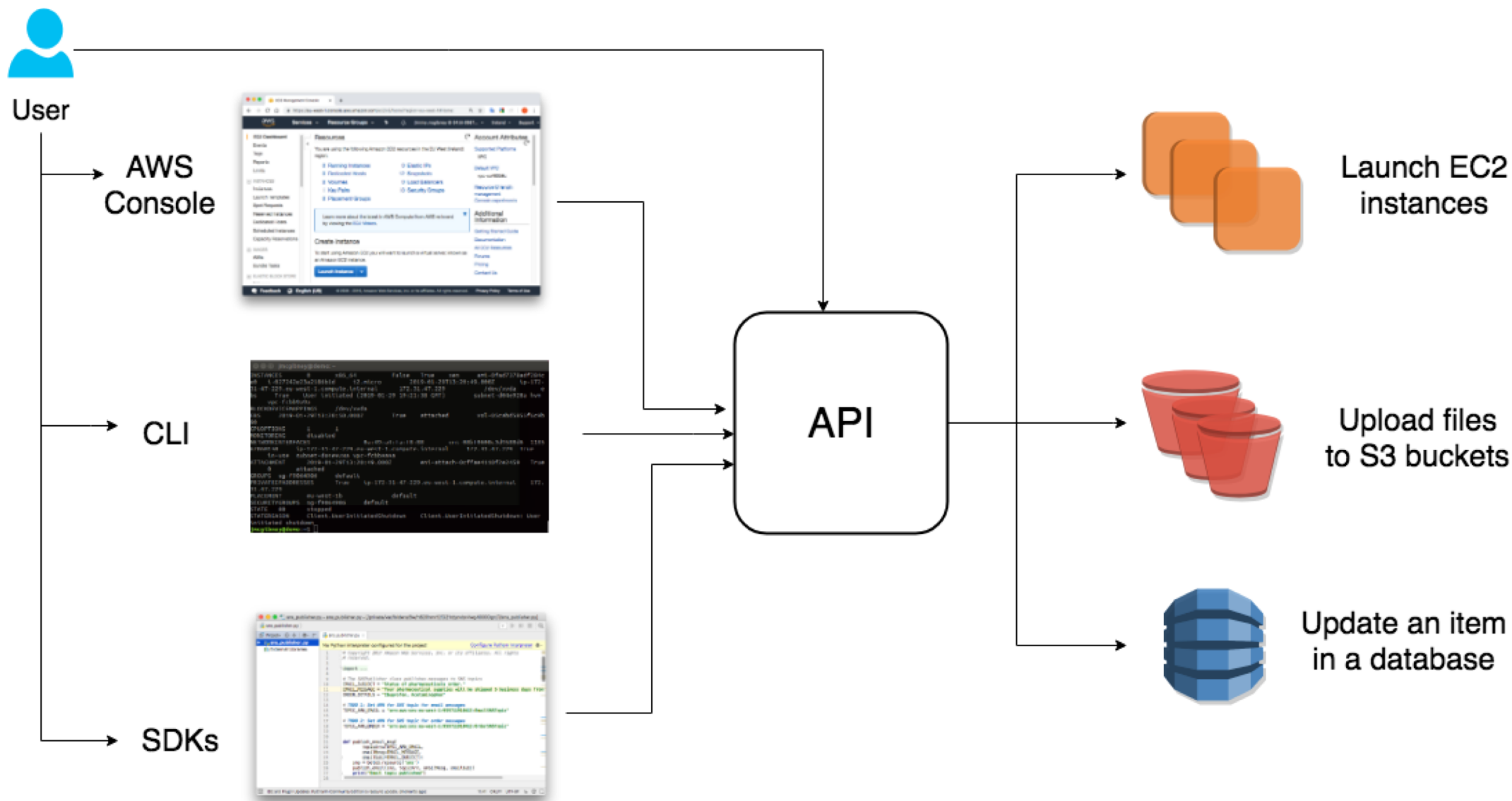
Developer Operations

Developing on AWS: Overview

Four ways to use AWS

- With AWS, all services are managed through an Application Programming Interface (API).
- A user can access this API in any of 4 ways:
 - Management Console
 - Command Line Interface (CLI)
 - Software Development Kit (SDK)
 - SDKs available for many languages (e.g. Python, Java, .NET)
 - Designed to simplify things for developers (compared with direct API calls)
 - Direct REST-like API calls
 - Using HTTP/HTTPS

Four ways to use AWS



Authentication

- Management Console based on Username and Password (+ optional MFA)
- All other methods based on API credentials
 - Access Key ID & Secret Access Key



**IAM
User**

Access Key ID: AKIAJ4YAT7URNZPQTEST
Secret Access Key: wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY

AWS CLI

```
jmcgibney@demo: ~  
jmcgibney@demo:~$ aws ec2 describe-instances  
RESERVATIONS    118567060150    r-01d71c3f18124f689  
INSTANCES       0             x86_64         False    True    xen    ami-0bce5ae5a9ce  
6d623 i-00dc204260426a28e    t2.micro        jrh      2018-12-12T18:07:22.000Z  
            ip-172-31-22-102.eu-west-1.compute.internal    172.31.22.102  
/dev/xvda      ebs          True    User initiated (2018-12-12 19:04:17 GMT)  
subnet-123d505a hvm          vpc-fcbb9a9a  
BLOCKDEVICEMAPPINGS    /dev/xvda
```

AWS SDK & API



Java



Python



.NET

Interoperability

- The various access modes can be used interchangeably
 - e.g. you could create an instance using Python/boto3, start it using the CLI and stop it using the management console
- They all use the API underneath
- Note though that changes made using API may not appear immediately in the console (most pages have a 'refresh' button)

Command Line Interface (CLI) format

Service
(command)

Operation
(sub-command)

Parameters

```
$ aws ec2 stop-instances --instance-id i-1234567890abcdef0
```

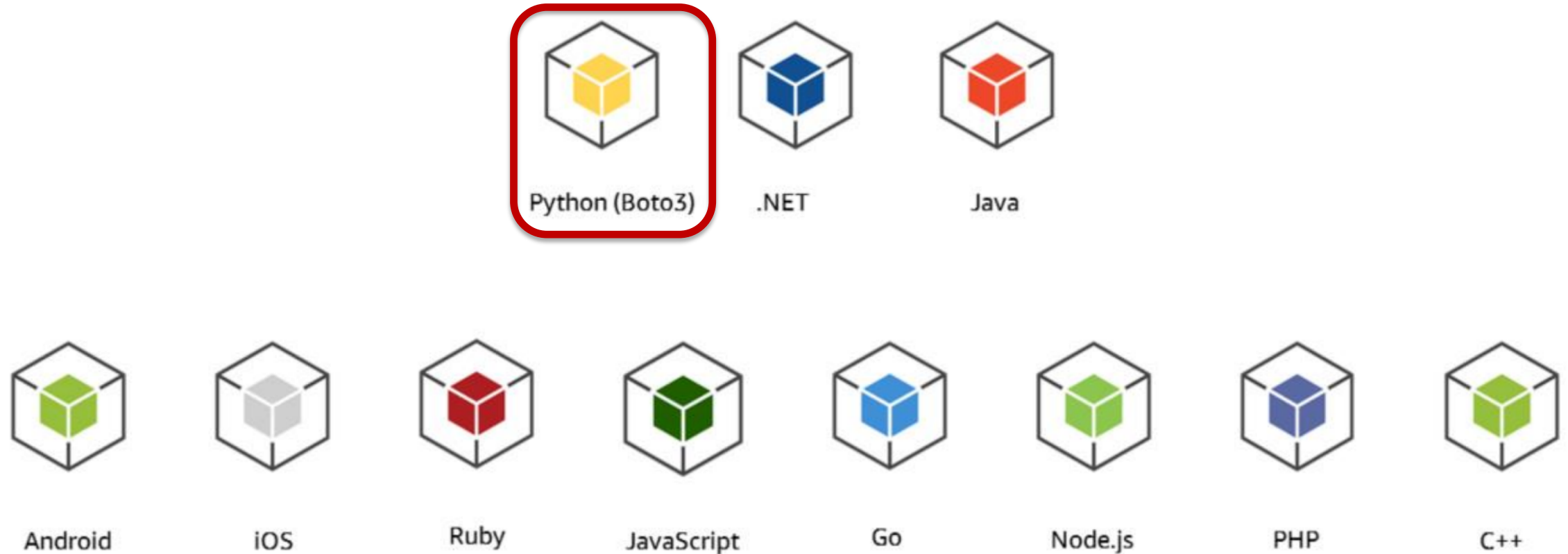
```
$ aws ec2 run-instances --cli-input-json file:///./lcf/webserver.json
```

```
$ aws help
```

```
$ aws ec2 help
```

```
$ aws ec2 describe-instances help
```

Software Development Kit (SDK) libraries for several languages



- We are using the Boto3 SDK for Python in this module
- This is a library of classes and functions that we can use in our Python programs

Connecting to a Service

- Can use Service Client API vs Resource API
- Resource API newer and usually recommended approach

Client API vs Resource API

Service Client API

- Focused on **services**
- More low-level
- What operations can be carried out with the service (e.g. EC2 or S3)
- Has objects for request and result data

```
ec2client = boto3.client('ec2')
```

Client API vs Resource API

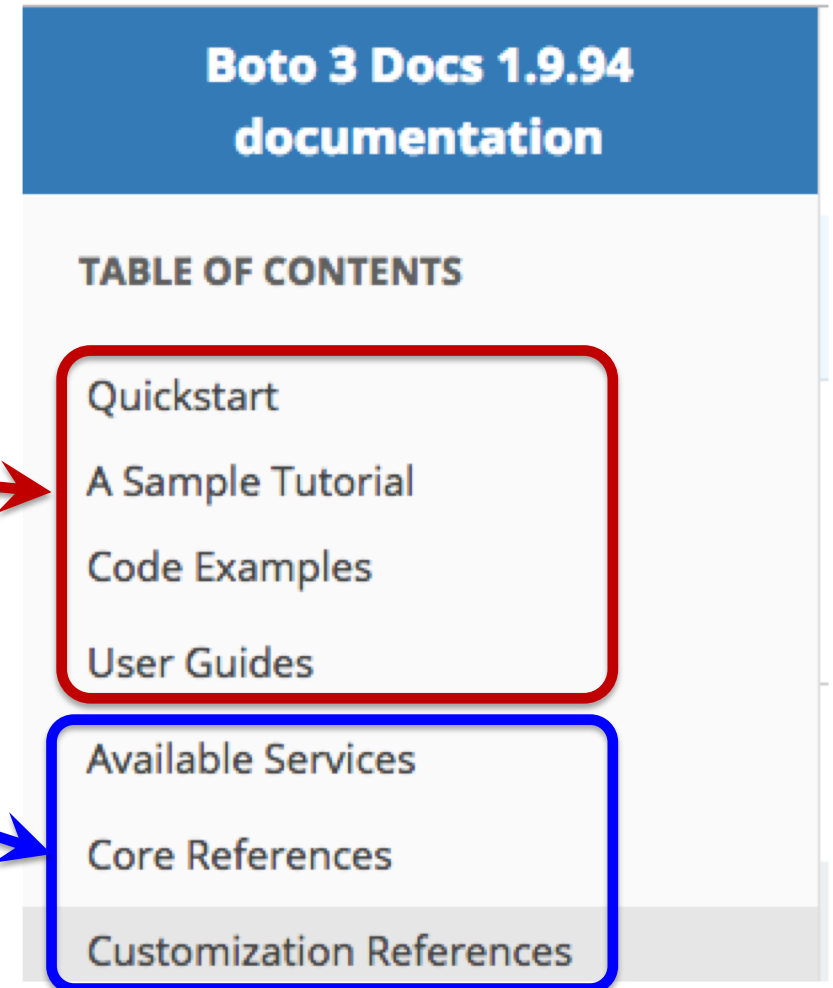
Resource API

- Focused on **resources**
- More high-level, more object oriented
- Has one class per conceptual resource
- Resource can be a service (e.g. EC2, S3) or an individual resource (e.g. an instance, a security group, an S3 bucket)

```
ec2resource = boto3.resource('ec2')
```

Navigating the Boto3 documentation

- Documentation home:
<https://boto3.readthedocs.io>
- Mix of:
 - User guide / tutorial / examples
 - Full references



**Boto 3 Docs 1.9.94
documentation**

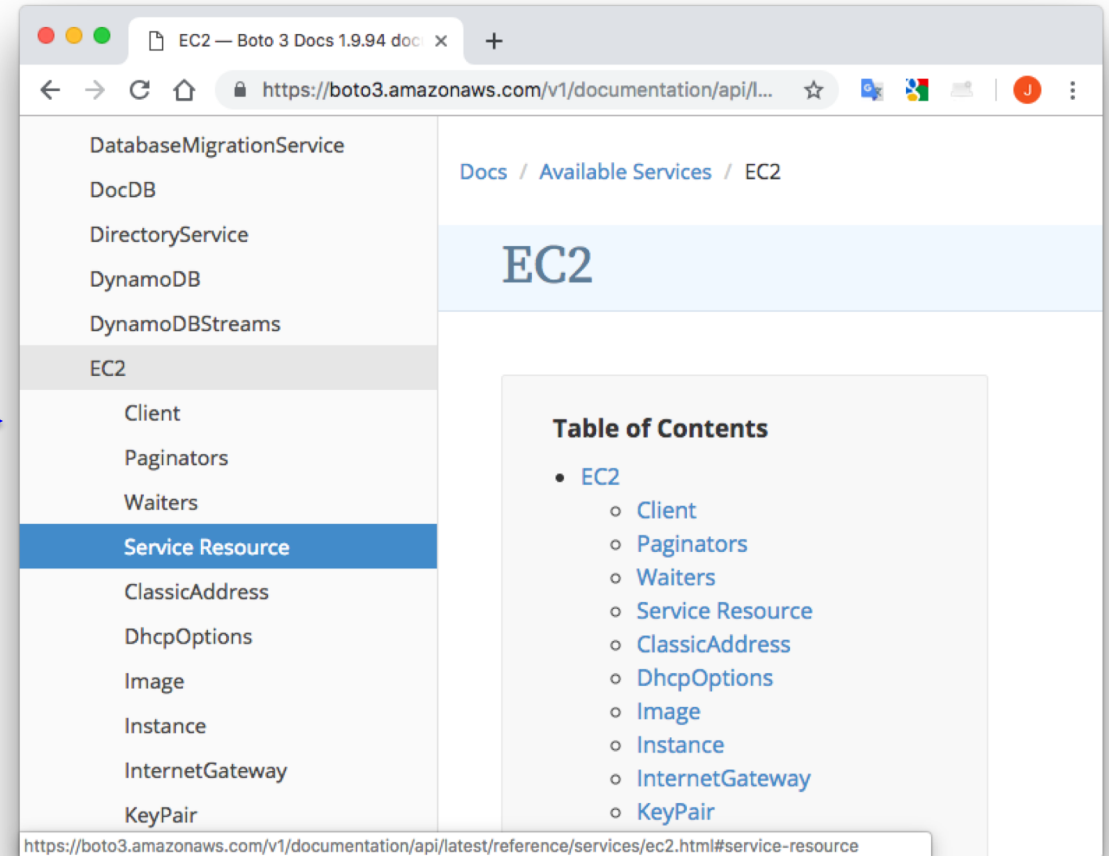
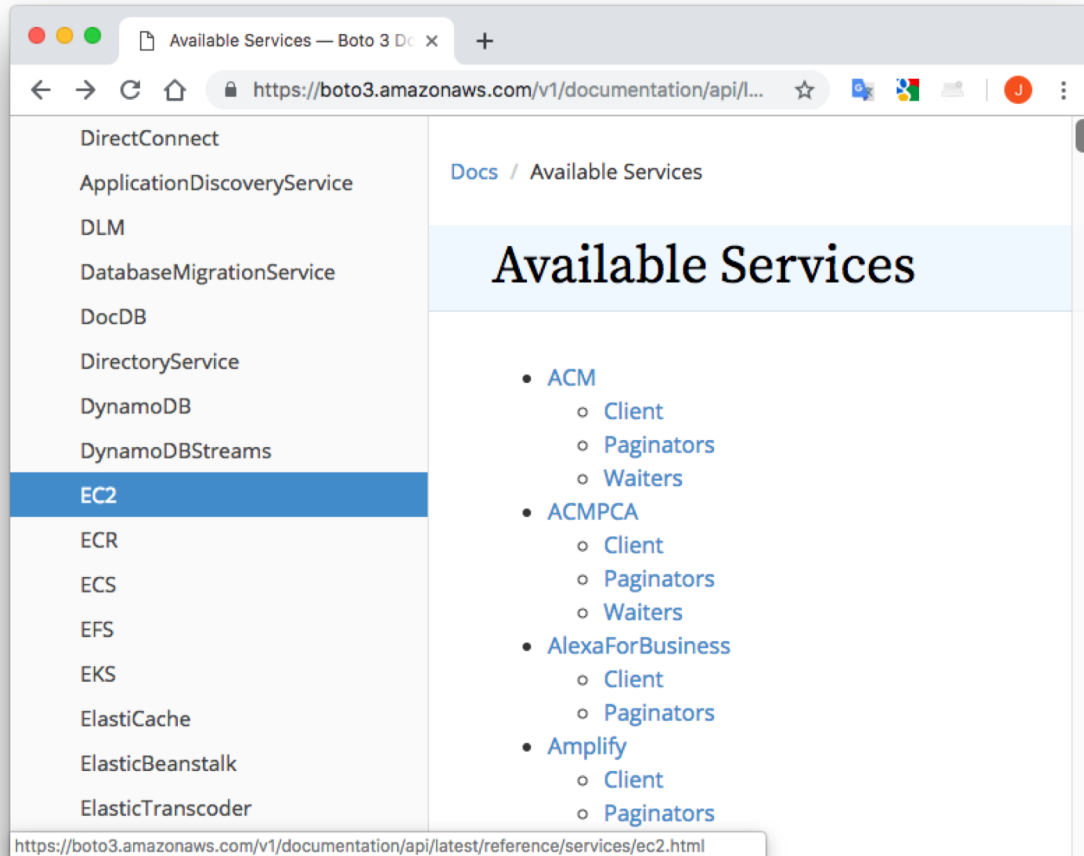
TABLE OF CONTENTS

- Quickstart
- A Sample Tutorial
- Code Examples
- User Guides
- Available Services
- Core References
- Customization References

The image shows a screenshot of the Boto 3 documentation page. The title bar is blue with white text. Below it, the 'TABLE OF CONTENTS' section lists various topics. A red rounded rectangle highlights the first four items: 'Quickstart', 'A Sample Tutorial', 'Code Examples', and 'User Guides'. A red arrow points from the text 'User guide / tutorial / examples' in the list to this red box. A blue rounded rectangle highlights the last three items: 'Available Services', 'Core References', and 'Customization References'. A blue arrow points from the text 'Full references' in the list to this blue box.

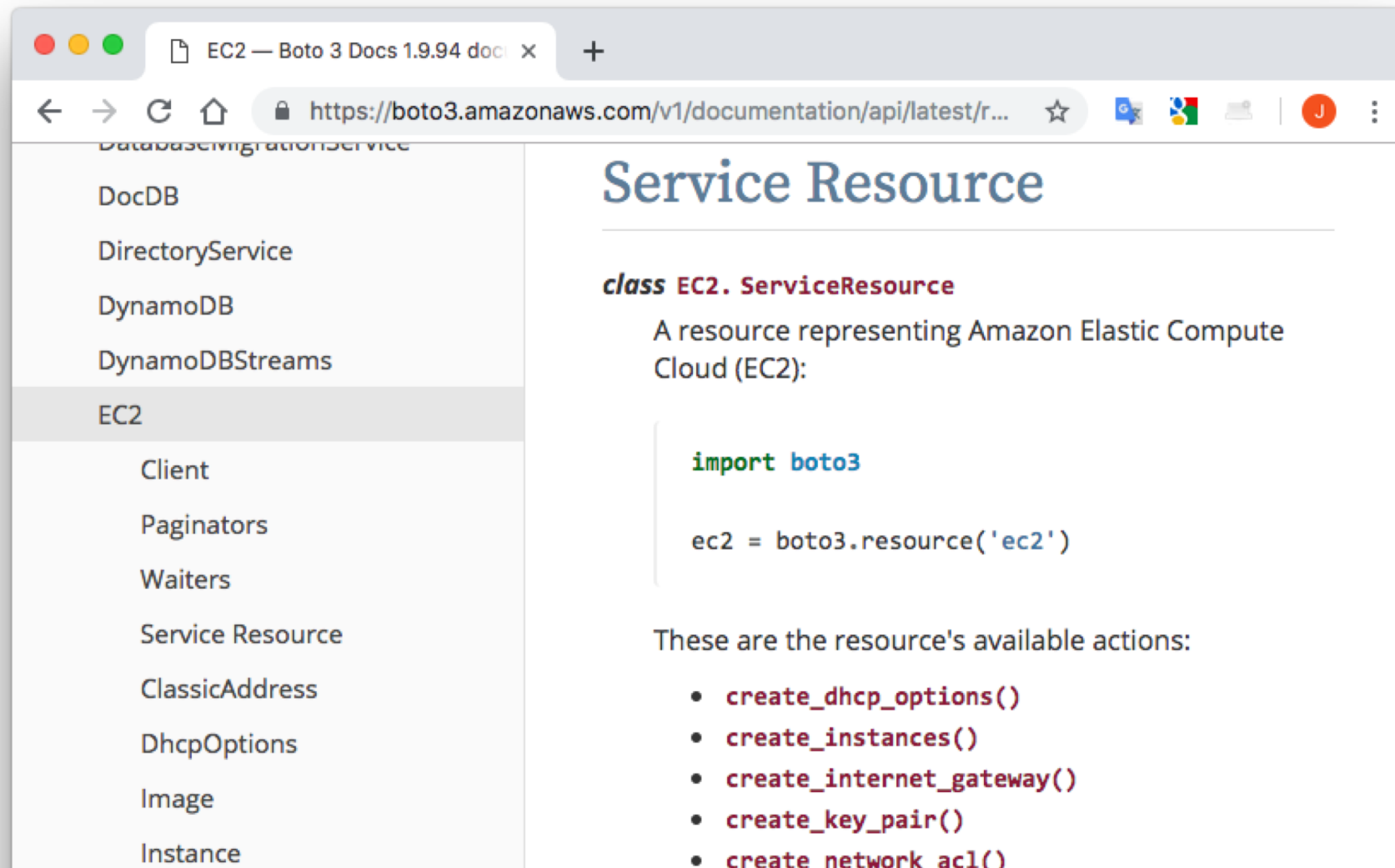
Navigating the Boto3 documentation

- **Available Services** is most useful reference section
 - Select the service you want; e.g. EC2, S3



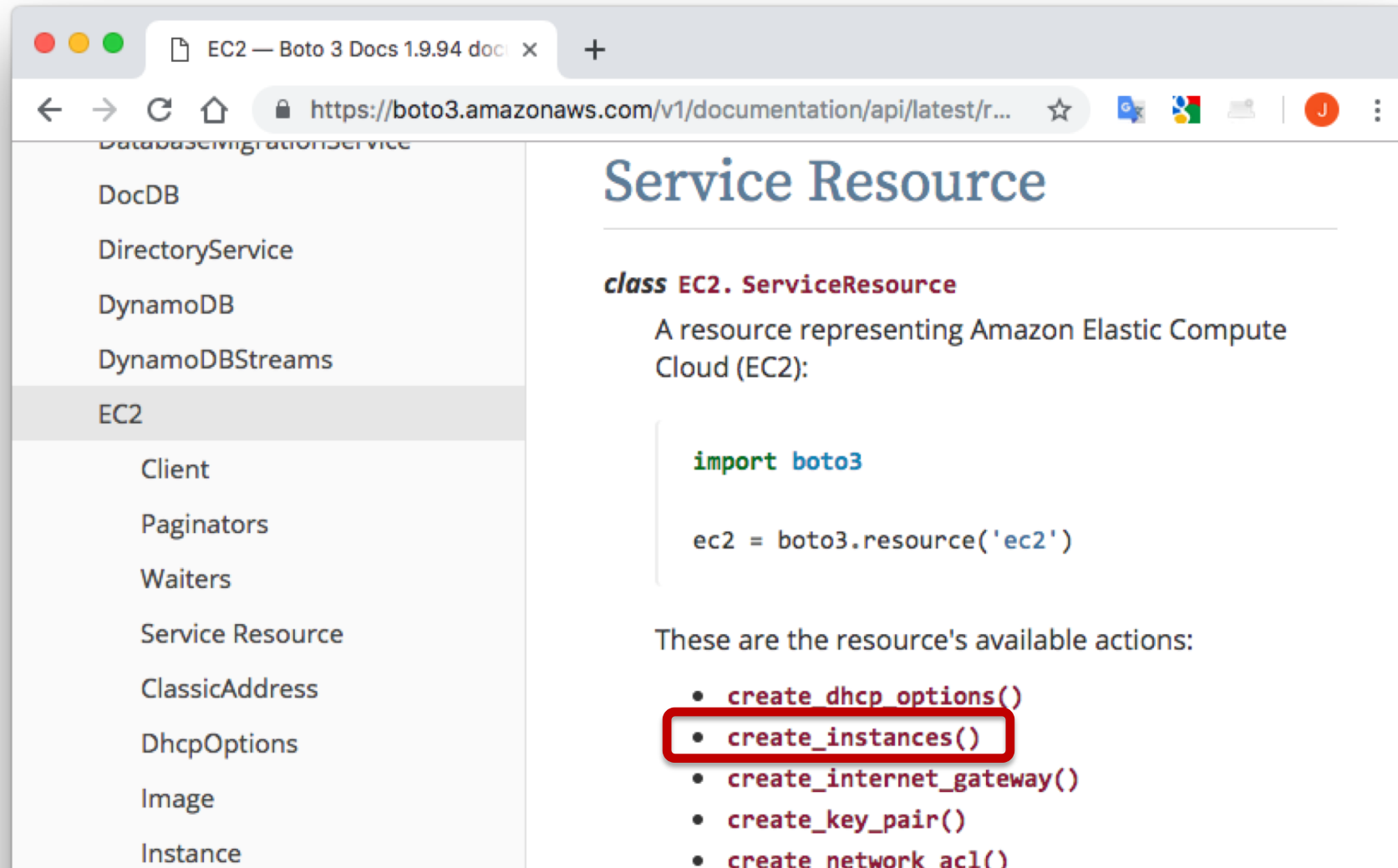
Navigating the Boto3 documentation

- And then the specific resource API (or client API)



Navigating the Boto3 documentation

- From which you can look at the detail of a specific method, for example



Navigating the Boto3 documentation

- From which you can look at the detail of a specific method, for example

