# Moto Documentation

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# GETTING STARTED


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A library that allows you to easily mock out tests based on AWS infrastructure.

CHAPTER

ONE

# GETTING STARTED

If you've never used `moto` before, you should read the *Getting Started with Moto* guide to get familiar with `moto` and its usage.

CHAPTER

TWO

# ADDITIONAL RESOURCES

- Moto Source Repository
- Moto Issue Tracker

## 2.1 Getting Started with Moto

### 2.1.1 Installing Moto

You can use `pip` to install the latest released version of `moto`, and specify which service(s) you will use:

```
pip install 'moto[ec2,s3,..]'
```

This will install Moto, and the dependencies required for that specific service.

If you don't care about the number of dependencies, or if you want to mock many AWS services:

```
pip install 'moto[all]'
```

If you want to install `moto` from source:

```
git clone git://github.com/getmoto/moto.git
cd moto
pip install '.[all]'
```

### 2.1.2 Moto usage

For example, we have the following code we want to test:

```
import boto3

class MyModel:
    def __init__(self, name, value):
        self.name = name
        self.value = value

    def save(self):
        s3 = boto3.client("s3", region_name="us-east-1")
        s3.put_object(Bucket="mybucket", Key=self.name, Body=self.value)
```

There are several ways to verify that the value will be persisted successfully.

### Decorator

With a simple decorator wrapping, all calls to AWS are automatically mocked out.

```
import boto3
from moto import mock_aws
from mymodule import MyModel

@mock_aws
def test_my_model_save():
    conn = boto3.resource("s3", region_name="us-east-1")
    # We need to create the bucket since this is all in Moto's 'virtual' AWS account
    conn.create_bucket(Bucket="mybucket")

    model_instance = MyModel("steve", "is awesome")
    model_instance.save()

    body = conn.Object("mybucket", "steve").get()[
        "Body"].read().decode("utf-8")

    assert body == "is awesome"
```

### Context manager

Same as the Decorator, every call inside the `with` statement is mocked out.

```
def test_my_model_save():
    with mock_aws():
        conn = boto3.resource("s3", region_name="us-east-1")
        conn.create_bucket(Bucket="mybucket")

        model_instance = MyModel("steve", "is awesome")
        model_instance.save()

        body = conn.Object("mybucket", "steve").get()[
            "Body"].read().decode("utf-8")

        assert body == "is awesome"
```

### Raw

You can also start and stop the mocking manually.

```
def test_my_model_save():
    mock = mock_aws()
    mock.start()

    conn = boto3.resource("s3", region_name="us-east-1")
    conn.create_bucket(Bucket="mybucket")

    model_instance = MyModel("steve", "is awesome")
```

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```
    model_instance.save()

    body = conn.Object("mybucket", "steve").get()[
        "Body"].read().decode("utf-8")

    assert body == "is awesome"

    mock.stop()
```

### Unittest usage

If you use unittest to run tests, and you want to use *moto* inside *setUp*, you can do it with *.start()* and *.stop()* like:

```
import unittest
from moto import mock_aws
import boto3

def func_to_test(bucket_name, key, content):
    s3 = boto3.resource("s3")
    object = s3.Object(bucket_name, key)
    object.put(Body=content)

class MyTest(unittest.TestCase):

    bucket_name = "test-bucket"
    def setUp(self):
        self.mock_aws = mock_aws()
        self.mock_aws.start()

        # you can use boto3.client("s3") if you prefer
        s3 = boto3.resource("s3")
        bucket = s3.Bucket(self.bucket_name)
        bucket.create()

    def tearDown(self):
        self.mock_aws.stop()

    def test(self):
        content = b"abc"
        key = "/path/to/obj"

        # run the file which uploads to S3
        func_to_test(self.bucket_name, key, content)

        # check the file was uploaded as expected
        s3 = boto3.resource("s3")
        object = s3.Object(self.bucket_name, key)
        actual = object.get()["Body"].read()
        self.assertEqual(actual, content)
```

### Class Decorator

It is also possible to use decorators on the class-level.

The decorator is effective for every test-method inside your class. State is not shared across test-methods.

```
@mock_aws
class TestMockClassLevel(unittest.TestCase):
    def setUp(self):
        s3 = boto3.client("s3", region_name="us-east-1")
        s3.create_bucket(Bucket="mybucket")

    def test_creating_a_bucket(self):
        # 'mybucket', created in setUp, is accessible in this test
        # Other clients can be created at will

        s3 = boto3.client("s3", region_name="us-east-1")
        s3.create_bucket(Bucket="bucket_inside")

    def test_accessing_a_bucket(self):
        # The state has been reset before this method has started
        # 'mybucket' is recreated as part of the setUp-method
        # 'bucket_inside' however, created inside the other test, no longer exists
        pass
```

**Note:** A tearDown-method can be used to destroy any buckets/state, but because state is automatically destroyed before a test-method start, this is not strictly necessary.

### Stand-alone server mode

Moto also comes with a stand-alone server allowing you to mock out the AWS HTTP endpoints. This is useful if you are using any other language than Python.

```
$ moto_server -p3000
 * Running on http://127.0.0.1:3000/
```

See *Non-Python SDK's / Server Mode* for more information.

### 2.1.3 Recommended Usage

There are some important caveats to be aware of when using moto:

#### How do I avoid tests from mutating my real infrastructure

You need to ensure that the mocks are actually in place.

1. Ensure that your tests have dummy environment variables set up:

```
export AWS_ACCESS_KEY_ID='testing'
export AWS_SECRET_ACCESS_KEY='testing'
export AWS_SECURITY_TOKEN='testing'
export AWS_SESSION_TOKEN='testing'
export AWS_DEFAULT_REGION='us-east-1'
```

2. Do not embed credentials directly in your code. This is always considered bad practice, regardless of whether you use Moto. It also makes it impossible to configure fake credentials for testing purposes.
3. **VERY IMPORTANT**: ensure that you have your mocks set up *BEFORE* your *boto3* client is established. This can typically happen if you import a module that has a *boto3* client instantiated outside of a function. See *What about those pesky imports* below on how to work around this.

---

**Note:** By default, the region must be one supported by AWS, see *Can I mock the default AWS region?* for how to change this.

---

#### Example on usage

If you are a user of pytest, you can leverage pytest fixtures to help set up your mocks and other AWS resources that you would need.

Here is an example:

```
@pytest.fixture(scope="function")
def aws_credentials():
    """Mocked AWS Credentials for moto."""
    os.environ["AWS_ACCESS_KEY_ID"] = "testing"
    os.environ["AWS_SECRET_ACCESS_KEY"] = "testing"
    os.environ["AWS_SECURITY_TOKEN"] = "testing"
    os.environ["AWS_SESSION_TOKEN"] = "testing"
    os.environ["AWS_DEFAULT_REGION"] = "us-east-1"

@pytest.fixture(scope="function")
def aws(aws_credentials):
    with mock_aws():
        yield boto3.client("s3", region_name="us-east-1")

@pytest.fixture
def create_bucket1(aws):
    boto3.client("s3").create_bucket(Bucket="b1")

@pytest.fixture
```

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```
def create_bucket2(aws):
    boto3.client("s3").create_bucket(Bucket="b2")

def test_s3_directly(aws):
    s3.create_bucket(Bucket="somebucket")

    result = s3.list_buckets()
    assert len(result["Buckets"]) == 1

def test_bucket_creation(create_bucket1, create_bucket2):
    buckets = boto3.client("s3").list_buckets()["Buckets"]
    assert len(result["Buckets"]) == 2
```

In the code sample above, all of the AWS/mocked fixtures take in a parameter of *aws_credentials*, which sets the proper fake environment variables. The fake environment variables are used so that *botocore* doesn't try to locate real credentials on your system.

With Moto activated within the fixture, we can pass it to a test-method to ensure that any other AWS-calls are also mocked inside that test method. We can also combine multiple fixtures that use the same Moto-fixture.

Moto will delete any data after the mock ends, so the state is not shared across methods.

### What about those pesky imports

As mentioned earlier, mocks should be established __BEFORE__ the clients are set up.

Some background on why this is necessary: Moto intercepts HTTP requests using a custom event handler that hooks into botocore's event-system. When creating clients/resources, *boto3* gathers all event handlers that have been registered at that point, and injects those handlers into the created client/resource. Event handlers registered after a client is created, are not used.

The *moto.core*-package registers our event handler on initialization. So to be pedantic: *moto.core* should be imported before a client is created, in order for *boto3* to call our custom handler and therefore for Moto to be active. The easiest way to ensure this happens, is to establish a mock before the clients are setup, as *moto.core* is imported when the mock starts.

One way to avoid import issues is to make use of local Python imports – i.e. import the module that creates boto3-clients inside of the unit test you want to run.

Example:

```
def test_something(aws):
    # s3 is a fixture defined above that yields a boto3 s3 client.

    from some.package.that.does.something.with.s3 import some_func # <-- Local import␣
↪for unit test
    # ^^ Importing here ensures that the mock has been established.

    some_func()  # The mock has been established from the "s3" pytest fixture, so this␣
↪function that uses
                 # a package-level S3 client will properly use the mock and not reach␣
↪out to AWS.
```

#### Patching the client or resource

If it is not possible to rearrange imports, we can patch the boto3-client or resource after the mock has started. See the following code sample:

```
# The client can come from an import, an __init__-file, wherever..
outside_client = boto3.client("s3")
s3 = boto3.resource("s3")

@mock_aws
def test_mock_works_with_client_or_resource_created_outside():
    from moto.core import patch_client, patch_resource
    patch_client(outside_client)
    patch_resource(s3)

    assert outside_client.list_buckets()["Buckets"] == []

    assert list(s3.buckets.all()) == []
```

This will ensure that the boto3 requests are still mocked.

#### Other caveats

For Tox, Travis CI, Github Actions, and other build systems, you might need to also create fake AWS credentials. The following command will create the required file with some bogus-credentials:

```
mkdir ~/.aws && touch ~/.aws/credentials && echo -e "[default]\naws_access_key_id = test\
↪naws_secret_access_key = test" > ~/.aws/credentials
```

## 2.2 Non-Python SDK's / Server Mode

Moto has a stand-alone server mode. This allows you to use Moto with any of the official AWS SDK's.

### 2.2.1 Installation

Install the required dependencies using:

```
pip install moto[server]
```

You can then start it like this:

```
$ moto_server
```

You can also pass the port:

```
$ moto_server -p3000
 * Running on http://127.0.0.1:3000/
```

If you want to be able to use the server externally you can pass an IP address to bind to as a hostname or allow any of your external interfaces with 0.0.0.0:

```
$ moto_server -H 0.0.0.0
 * Running on http://0.0.0.0:5000/
```

Please be aware this might allow other network users to access your server.

### 2.2.2 Start within Python

It is possible to start this server from within Python, in a separate thread. By default, this server will start on port 5000, but this is configurable.

```
from moto.server import ThreadedMotoServer
server = ThreadedMotoServer()
server.start()
# run tests
client = boto3.client("service", endpoint_url="http://localhost:5000")
...
server.stop()
```

Note that the ThreadedMotoServer and the decorators act on the same state, making it possible to combine the two approaches. See the following example:

```
class TestThreadedMotoServer(unittest.TestCase):

    def setUp(self):
        self.server = ThreadedMotoServer()
        self.server.start()

    def tearDown(self):
        self.server.stop()

    @mock_aws
    def test_load_data_using_decorators(self):
        server_client = boto3.client("s3", endpoint_url="http://127.0.0.1:5000")
        server_client.create_bucket(Bucket="test")

        in_mem_client = boto3.client("s3")
        buckets = in_mem_client.list_buckets()["Buckets"]
        self.assertEqual([b["Name"] for b in buckets], ["test"])
```

This example shows it is possible to create state using the TreadedMotoServer, and access that state using the usual decorators. Note that the decorators will destroy any resources on start, so make sure to not accidentally destroy any resources created by the ThreadedMotoServer that should be kept.

### 2.2.3 Run using Docker

You could also use the official Docker image. This is stored in two different repositories:

- https://hub.docker.com/r/motoserver/moto/tags
- https://github.com/getmoto/moto/pkgs/container/motoserver

```
docker run --rm -p 5000:5000 --name moto motoserver/moto:latest
docker run --rm -p 5000:5000 --name moto ghcr.io/getmoto/motoserver:latest
```

**Example docker-compose.yaml**

Look at server.py to find more environment variables.

```
motoserver:
  image: motoserver/moto:latest
  ports:
    - "3000:3000"
  environment:
    - MOTO_PORT=3000 # set moto listener port with env var
```

### 2.2.4 Example Usage

To use Moto in your tests, pass the *endpoint_url*-parameter to the SDK of your choice.

For more recent SDK's, this can be configured using the environment variable *AWS_ENDPOINT_URL*. See the official AWS documentation: https://docs.aws.amazon.com/sdkref/latest/guide/feature-ss-endpoints.html

If your SDK does not support this, here are some code samples to set this parameter the old-fashioned way.

In Python:

```
boto3.resource(
    service_name='s3',
    region_name='us-west-1',
    endpoint_url='http://localhost:5000'
)
```

In Java:

```
AmazonSQS sqs = new AmazonSQSClient();
sqs.setRegion(Region.getRegion(Regions.US_WEST_2));
sqs.setEndpoint("http://localhost:5000");
```

In Scala:

```
val region = Region.getRegion(Regions.US_WEST_2).getName
val serviceEndpoint = "http://localhost:5000"
val config = new AwsClientBuilder.EndpointConfiguration(serviceEndpoint, region)
val amazonSqs =  AmazonSQSClientBuilder.standard().withEndpointConfiguration(config).
↪build
```

In Terraform:

```
provider "aws" {
    region                      = "us-east-1"
    skip_credentials_validation = true
    skip_metadata_api_check     = true
    skip_requesting_account_id  = true
    s3_force_path_style         = true

    endpoints {
        lambda           = "http://localhost:5000"
    }
}
```

See the Terraform Docs for more information.

Other languages:

- Java
- Ruby
- Javascript

### 2.2.5 Use ServerMode using the decorators

It is possible to call the MotoServer for tests that were written using decorators. The following environment variables can be set to achieve this:

```
TEST_SERVER_MODE=true
```

Whenever a mock-decorator starts, Moto will:

1. Send a reset-request to `http://localhost:5000`, removing all state that was kept
2. Add the `endpoint_url` parameter to boto3, so that all requests will be made to `http://localhost:5000`.

Optionally, the *http://localhost:5000* endpoint can be overridden by:

```
TEST_SERVER_MODE_ENDPOINT=http://moto-server:5000
```

This can be used for example in case of docker-compose configuration that runs Moto server in a separate service container.

Calling the reset-API ensures the same behaviour as normal decorators, where the complete state is removed. It is possible to keep the state in between tests, using this environment variable:

```
MOTO_CALL_RESET_API=false
```

### 2.2.6 Dashboard

Moto comes with a dashboard to view the current state of the system:

```
http://localhost:5000/moto-api/
```

### 2.2.7 Reset API

An internal API endpoint is provided to reset the state of all of the backends. This will remove all S3 buckets, EC2 servers, etc.:

```
requests.post("http://motoapi.amazonaws.com/moto-api/reset")
```

### 2.2.8 Install with Homebrew

Moto is also available to install using Homebrew, which makes it much easier to manage if you're not using Python as your primary development language.

Once Homebrew is installed, you can install Moto by running:

```
brew install moto
```

To make the Moto server start up automatically when you log into your computer, you can run:

```
brew services start moto
```

### 2.2.9 Caveats

The standalone server has some caveats with some services. The following services require that you update your hosts file for your code to work properly:

1. *s3-control*

For the above services, this is required because the hostname is in the form of *AWS_ACCOUNT_ID.localhost*. As a result, you need to add that entry to your host file for your tests to function properly.

## 2.3 Proxy Mode

Moto can be run as a proxy, intercepting all requests to AWS and mocking them instead. Some of the benefits:

- Easy to configure for all SDK's
- Can be reached by Lambda containers, allowing you to mock service-calls inside a Lambda-function

### 2.3.1 Installation

Install the required dependencies using:

```
pip install moto[proxy]
```

You can then start the proxy like this:

```
$ pip install moto[proxy]
$ moto_proxy
```

Note that, if you want your Lambda functions to reach this proxy, you need to open up the moto_proxy:

```
$ moto_proxy -H 0.0.0.0
```

> **Warning:** Be careful not to use this on a public network - this allows all network users access to your server.

### 2.3.2 Quick usage

The help command shows a quick-guide on how to configure SDK's to use the proxy. .. code-block:: bash

$ moto_proxy –help

### 2.3.3 Extended Configuration

To use the MotoProxy while running your tests, the AWS SDK needs to know two things:

- The proxy endpoint
- How to deal with SSL

To set the proxy endpoint, use the *HTTPS_PROXY*-environment variable.

Because the proxy does not have an approved SSL certificate, the SDK will not trust the proxy by default. This means that the SDK has to be configured to either

1. Accept the proxy's custom certificate, by setting the *AWS_CA_BUNDLE*-environment variable
2. Allow unverified SSL certificates

The *AWS_CA_BUNDLE* needs to point to the location of the CA certificate that comes with Moto. You can run *moto_proxy –help* to get the exact location of this certificate, depending on where Moto is installed.

### 2.3.4 Environment Variables Configuration:

```
export HTTPS_PROXY=http://localhost:5005
aws cloudformation list-stacks --no-verify-ssl
```

Or by configuring the AWS_CA_BUNDLE:

```
export HTTPS_PROXY=http://localhost:5005
export AWS_CA_BUNDLE=/location/of/moto/ca/cert.crt
aws cloudformation list-stacks
```

### 2.3.5 Python Configuration

If you're already using Moto's *mock_service*-decorators, you can use a custom environment variable that configures everything automatically:

```
TEST_PROXY_MODE=true pytest
```

To configure this manually:

```
from botocore.config import Config

config = Config(proxies={"https": "http://localhost:5005"})
client = boto3.client("s3", config=config, verify=False)
```

### 2.3.6 Terraform Configuration

```
provider "aws" {
    region                      = "us-east-1"
    http_proxy                  = "http://localhost:5005"
    custom_ca_bundle            = "/location/of/moto/ca/cert.crt"
    # OR
    insecure                    = true
}
```

### 2.3.7 URL Passthroughs

If some URL's should not be intercepted, you can configure the MotoProxy to pass them through.

To do so, make the following HTTP request:

```
config_url = "http://motoapi.amazonaws.com/moto-api/proxy/passthrough"
proxies = {"http": "http://localhost:5005", "https": "http://localhost:5005"}

http_url = "http://some_website.com/path"
https_host = "google.com"
config = {"http_urls": [http_url], "https_hosts": [https_host]}

requests.post(config_url, json=config, proxies=proxies)
```

Note the difference between *http_url* and *https_hosts*. You can configure a full URL to intercept **if and only if** it is a HTTP (unsecured) url.

If you want to passthrough a request to a HTTPS endpoint, you have to specify the HTTPS host. Say you want to make a request to *https://companywebsite.com/mydata*, the *https_host* would have to be set to *companywebsite.com*.

All HTTPS requests to this domain will be intercepted.

### 2.3.8 Alternative Passthrough

If your test setup supports the *NO_PROXY* environment variable, you could exclude *www.thirdpartyservice.com* from being proxied by setting *NO_PROXY=www.thirdpartyservice.com*. *NO_PROXY* accepts a comma separated list of domains, e.g. *NO_PROXY=.thirdpartyservice.com,api.anotherservice.com*.

## 2.4 FAQ

### 2.4.1 Why is my test data disappearing?

To prevent state from leaking across different tests, Moto automatically deletes any created data after a Moto-decorator ends.

So make sure that your decorator is active for the entire duration of the test-method.

### 2.4.2 Is Moto concurrency safe?

No. Moto is not designed for multithreaded access/multiprocessing.

Moto's internal state, encompassing resource creations and modifications, is managed within the context of the thread in which it is invoked. In a multithreading environment, Python's threading model involves creating a new thread that initially copies the global context from the main thread. However, it's crucial to understand that this copy is a one-time snapshot at the moment of thread creation.

If Moto is employed to mock AWS services in a secondary thread, resources created or modified within that thread may not be visible to other threads or the main thread. The initial copy of the global context to the new thread means that the secondary thread depends on the state from the main thread in a read-only manner. Subsequent modifications or creations within the secondary thread do not propagate back to the main thread or affect the global context of other threads.

For example, if you are using Moto to mock the AWS Cognito IDP service and create users, and these operations are performed in a thread separate from the main application logic, the application may not be able to see the users created in the secondary thread. This limitation arises because, in Python, the new thread's initial state is a copy of the main thread's state, and any changes in one thread do not automatically reflect in other threads and vice versa.

It is essential to consider this behavior when using Moto in scenarios involving multiple threads. For tests that require resource modifications, such as creating or updating AWS resources, it is recommended to ensure that Moto operations are performed within the same thread context as the application or test logic to ensure consistent behavior.

### 2.4.3 Why am I getting RUST errors when installing Moto?

Moto has a dependency on the pip-module *cryptography*. As of Cryptography >= 3.4, this module requires Rust as a dependency. Most OS/platforms will support the installation of Rust, but if you're getting any errors related to this, see the cryptography documentation for more information: https://cryptography.io/en/latest/installation/#rust

### 2.4.4 Can I mock the default AWS region?

By default, Moto only allows valid regions, supporting the same regions that AWS supports.

If you want to mock the default region, as an additional layer of protection against accidentally touching your real AWS environment, you can disable this validation:

```
os.environ["MOTO_ALLOW_NONEXISTENT_REGION"] = True
os.environ["AWS_DEFAULT_REGION"] = "antarctica"
```

### 2.4.5 How can I mock my own HTTP-requests, using the Responses-module?

Moto uses it's own Responses-mock to intercept AWS requests, so if you need to intercept custom (non-AWS) request as part of your tests, you may find that Moto 'swallows' any pass-thru's that you have defined. You can pass your own Responses-mock to Moto, to ensure that any custom (non-AWS) are handled by that Responses-mock.

```
from moto.core.models import override_responses_real_send

my_own_mock = responses.RequestsMock(assert_all_requests_are_fired=True)
override_responses_real_send(my_own_mock)
my_own_mock.start()
my_own_mock.add_passthru("http://some-website.com")

# Unset this behaviour at the end of your tests
override_responses_real_send(None)
```

## 2.5 IAM-like Access Control

Moto also has the ability to authenticate and authorize actions, just like it's done by IAM in AWS. This functionality can be enabled by either setting the *INITIAL_NO_AUTH_ACTION_COUNT* environment variable or using the *set_initial_no_auth_action_count* decorator. Note that the current implementation is very basic, see the source code for more information.

### 2.5.1 *INITIAL_NO_AUTH_ACTION_COUNT*

If this environment variable is set, moto will skip performing any authentication as many times as the variable's value, and only starts authenticating requests afterwards. If it is not set, it defaults to infinity, thus moto will never perform any authentication at all.

### 2.5.2 *set_initial_no_auth_action_count*

This is a decorator that works similarly to the environment variable, but the settings are only valid in the function's scope. When the function returns, everything is restored.

```
@set_initial_no_auth_action_count(4)
@mock_aws
def test_describe_instances_allowed():
    policy_document = {
        "Version": "2012-10-17",
```

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```
        "Statement": [
            {
                "Effect": "Allow",
                "Action": "ec2:Describe*",
                "Resource": "*"
            }
        ]
    }
    access_key = ...
    # create access key for an IAM user/assumed role that has the policy above.
    # this part should call __exactly__ 4 AWS actions, so that authentication and␣
↪authorization starts exactly after this

    client = boto3.client('ec2', region_name='us-east-1',
                          aws_access_key_id=access_key['AccessKeyId'],
                          aws_secret_access_key=access_key['SecretAccessKey'])

    # if the IAM principal whose access key is used, does not have the permission to␣
↪describe instances, this will fail
    instances = client.describe_instances()['Reservations'][0]['Instances']
    assert len(instances) == 0
```

See the related test suite for more examples.

## 2.6 AWS Config Support

An experimental feature for AWS Config has been developed to provide AWS Config capabilities in your unit tests. This feature is experimental as there are many services that are not yet supported and will require the community to add them in over time. This page details how the feature works and how you can use it.

### 2.6.1 What is this and why would I use this?

AWS Config is an AWS service that describes your AWS resource types and can track their changes over time. At this time, moto does not have support for handling the configuration history changes, but it does have a few methods mocked out that can be immensely useful for unit testing.

If you are developing automation that needs to pull against AWS Config, then this will help you write tests that can simulate your code in production.

### 2.6.2 How does this work?

The AWS Config capabilities in moto work by examining the state of resources that are created within moto, and then returning that data in the way that AWS Config would return it (sans history). This will work by querying all of the moto backends (regions) for a given resource type.

However, this will only work on resource types that have this enabled.

#### Current enabled resource types

1. S3 (all)
2. IAM (Role, Policy)

### 2.6.3 Developer Guide

There are several pieces to this for adding new capabilities to moto:

1. Listing resources
2. Describing resources

For both, there are a number of pre-requisites:

#### Base Components

In the *moto/core/models.py* file is a class named *ConfigQueryModel*. This is a base class that keeps track of all the resource type backends.

At a minimum, resource types that have this enabled will have:

1. A *config.py* file that will import the resource type backends (from the *__init__.py*)
2. In the resource's *config.py*, an implementation of the *ConfigQueryModel* class with logic unique to the resource type
3. An instantiation of the *ConfigQueryModel*
4. In the *moto/config/models.py* file, import the *ConfigQueryModel* instantiation, and update *RESOURCE_MAP* to have a mapping of the AWS Config resource type to the instantiation on the previous step (just imported).

An example of the above is implemented for S3. You can see that by looking at:

1. *moto/s3/config.py*
2. *moto/config/models.py*

#### Testing

For each resource type, you will need to test write tests for a few separate areas:

- Test the backend queries to ensure discovered resources come back (ie for *IAM::Policy*, write *tests.tests_iam.test_policy_list_config_discovered_resources*). For writing these tests, you must not make use of *boto* to create resources. You will need to use the backend model methods to provision the resources. This is to make tests compatible with the moto server. You must make tests for the resource type to test listing and object fetching.
- Test the config dict for all scenarios (ie for *IAM::Policy*, write *tests.tests_iam.test_policy_config_dict*). For writing this test, you'll need to create resources in the same way as the first test (without using *boto*), in every meaningful configuration that would produce a different config dict. Then, query the backend and ensure each of the dicts are as you expect.
- Test that everything works end to end with the *boto* clients. (ie for *IAM::Policy*, write *tests.tests_iam.test_policy_config_client*). The main two items to test will be the *boto.client('config').list_discovered_resources()*, *boto.client('config').list_aggregate_discovered_resources()*, *moto.client('config').batch_get_resource_config()*, and *moto.client('config').batch_aggregate_get_resource_config()*. This test doesn't have to be super thorough,

but it basically tests that the front end and backend logic all works together and returns correct resources. Beware the aggregate methods all have capital first letters (ie *Limit*), while non-aggregate methods have lowercase first letters (ie *limit*)

### Listing

S3 is currently the model implementation, but it also odd in that S3 is a global resource type with regional resource residency.

But for most resource types the following is true:

1. There are regional backends with their own sets of data
2. Config aggregation can pull data from any backend region – we assume that everything lives in the same account

Implementing the listing capability will be different for each resource type. At a minimum, you will need to return a *List* of *Dict* that look like this:

```
[
   {
       'type': 'AWS::The AWS Config data type',
       'name': 'The name of the resource',
       'id': 'The ID of the resource',
       'region': 'The region of the resource -- if global, then you may want to have the␣
↪calling logic pass in the
                 aggregator region in for the resource region -- or just us-east-1 :P'
   }
   , ...
]
```

It's recommended to read the comment for the *ConfigQueryModel*'s *list_config_service_resources* function in [base class here](moto/core/models.py).

^^ The AWS Config code will see this and format it correct for both aggregated and non-aggregated calls.

### General implementation tips

The aggregation and non-aggregation querying can and should just use the same overall logic. The differences are:

1. Non-aggregated listing will specify the region-name of the resource backend *backend_region* 1. Aggregated listing will need to be able to list resource types across ALL backends and filter optionally by passing in *resource_region*.

An example of a working implementation of this is S3.

Pagination should generally be able to pull out the resource across any region so should be sharded by *region-item-name* – not done for S3 because S3 has a globally unique name space.

#### Describing Resources

Fetching a resource's configuration has some similarities to listing resources, but it requires more work (to implement). Due to the various ways that a resource can be configured, some work will need to be done to ensure that the Config dict returned is correct.

For most resource types the following is true:

1. There are regional backends with their own sets of data 1. Config aggregation can pull data from any backend region – we assume that everything lives in the same account

The current implementation is for S3. S3 is very complex and depending on how the bucket is configured will depend on what Config will return for it.

When implementing resource config fetching, you will need to return at a minimum *None* if the resource is not found, or a *dict* that looks like what AWS Config would return.

It's recommended to read the comment for the *ConfigQueryModel* 's *get_config_resource* function in the base class.

## 2.7 Multi-Account support

By default, Moto processes all requests in a default account: *123456789012*. The exact credentials provided are usually ignored to make the process of mocking requests as hassle-free as possible.

If you want to mock resources in multiple accounts, or you want to change the default account ID, there are multiple ways to achieve this.

### 2.7.1 Configure the default account

It is possible to configure the default account ID that will be used for all incoming requests, by setting the environment variable *MOTO_ACCOUNT_ID*.

Here is an example of what this looks like in practice:

```
# Create a bucket in the default account
client = boto3.client("s3", region_name="us-east-1")
client.create_bucket(Bucket="bucket-default-account")

# Configure another account - all subsequent requests will use this account ID
os.environ["MOTO_ACCOUNT_ID"] = "111111111111"
client.create_bucket(Bucket="bucket-in-account-2")

assert [b["Name"] for b in client.list_buckets()["Buckets"]] == ["bucket-in-account-2"]

# Now revert to the default account, by removing the environment variable
del os.environ["MOTO_ACCOUNT_ID"]
assert [b["Name"] for b in client.list_buckets()["Buckets"]] == ["bucket-default-account
↪"]
```

### 2.7.2 Configure the account ID using a request header

If you are using Moto in ServerMode you can add a custom header to a request, to specify which account should be used.

**Note:** Moto will only look at the request-header if the environment variable is not set.

As an example, this is how you would create an S3-bucket in another account:

```
headers ={"x-moto-account-id": "333344445555"}
requests.put("http://bucket.localhost:5000/", headers=headers)

# This will return a list of all buckets in account 333344445555
requests.get("http://localhost:5000", headers=headers)

# This will return an empty list, as there are no buckets in the default account
requests.get("http://localhost:5000")
```

### 2.7.3 Configure an account using STS

The *STS.assume_role()*-feature is useful if you want to temporarily use a different set of access credentials. Passing in a role that belongs to a different account will return a set of credentials that give access to that account.

**Note:** To avoid any chicken-and-egg problems trying to create roles in non-existing accounts, these Roles do not need to exist. Moto will only extract the account ID from the role, and create access credentials for that account.

**Note:** Moto will only look at the access credentials if the environment variable and request header is not set.

Let's look at some examples.

```
# Create a bucket using the default access credentials
client1 = boto3.client("s3", region_name="us-east-1")
client1.create_bucket(Bucket="foobar")

# Assume a role in our account
# Note that this Role does not need to exist
default_account = "123456789012"
sts = boto3.client("sts")
response = sts.assume_role(
    RoleArn=f"arn:aws:iam::{default_account}:role/my-role",
    RoleSessionName="test-session-name",
    ExternalId="test-external-id",
)

# These access credentials give access to the default account
client2 = boto3.client(
    "s3",
    aws_access_key_id=response["Credentials"]["AccessKeyId"],
    aws_secret_access_key=response["Credentials"]["SecretAccessKey"],
```

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```
    aws_session_token=response["Credentials"]["SessionToken"],
    region_name="us-east-1",
)
client2.list_buckets()["Buckets"].should.have.length_of(1)
```

Because we assumed a role within the same account, we can see the bucket that we've just created.

Things get interesting when assuming a role within a different account.

```
# Create a bucket with default access credentials
client1 = boto3.client("s3", region_name="us-east-1")
client1.create_bucket(Bucket="foobar")

# Assume a role in a different account
# Note that the Role does not need to exist
sts = boto3.client("sts")
response = sts.assume_role(
    RoleArn="arn:aws:iam::111111111111:role/role-in-another-account",
    RoleSessionName="test-session-name",
    ExternalId="test-external-id",
)

# Retrieve all buckets in this new account - this will be completely empty
client2 = boto3.client(
    "s3",
    aws_access_key_id=response["Credentials"]["AccessKeyId"],
    aws_secret_access_key=response["Credentials"]["SecretAccessKey"],
    aws_session_token=response["Credentials"]["SessionToken"],
    region_name="us-east-1",
)
client2.list_buckets()["Buckets"].should.have.length_of(0)
```

Because we've assumed a role in a different account, no buckets were found. The *foobar*-bucket only exists in the default account, not in *111111111111*.

## 2.8 Releases and Upgrade Paths

### 2.8.1 Release Schedule

There is no fixed release schedule, although we try to release a new version every 1 or 2 weeks.

Specific release intervals will be influenced by 1) high-priority bugs, 2) number of new features and 3) maintainer availability.

### 2.8.2 Development Releases

Every commit should result in a development release, marked as Pre-releases in PyPi and with the *latest*-tag in DockerHub.

### 2.8.3 Versioning scheme

**Moto follows a *semver* scheme: *major.minor.patch*.**

- A major releases indicates a breaking change
- A minor release indicates a big change, but nothing breaking
- A patch release will contain new features and bug fixes

### 2.8.4 Breaking Changes

A full list of all changes in a specific release can be found on Github: https://github.com/getmoto/moto/blob/master/CHANGELOG.md

A overview of the breaking changes between major versions:

**For Moto 2.x:**

- A change in the installation method. Use *pip install moto[service]* to only install the required dependencies for that service, or *pip install moto[all]* to install all (1.x behaviour)

**For Moto 3.x:**

- Removed compatibility with *boto*. Specifically: all *service_deprecated*-decorators were removed.
- The class-decorator now resets the state before every test-method (before, the state was global - shared between class-methods).
- ECS ARN's now use the new (long) format by default

**For Moto 4.x:**

- Removed decorators *mock_dynamodb2* and *mock_rds2* (they were functionally equivalent with *mock_dynamodb* and *mock_rds* since 3.x)

**For Moto 5.x:**

- All decorators have been replaced with *mock_aws*
- The *batch_simple* decorator has been replaced with: *@mock_aws(config={"batch": {"use_docker": False}})*
- The *awslambda_simple* decorator has been replaced with: *@mock_aws(config={"lambda": {"use_docker": False}})*
- When starting the MotoServer, the *service*-argument (i.e.: *motoserver s3*) is no longer supported. A single MotoServer-instance can be used for all AWS-services.

## 2.9 Configuration Options

Moto has a variety of ways to configure the mock behaviour.

If you are using the decorators, some options are configurable within the decorator:

```
@mock_aws(config={
    "batch": {"use_docker": True},
    "lambda": {"use_docker": True},
    "core": {
        "mock_credentials": True,
        "passthrough": {
            "urls": ["s3.amazonaws.com/bucket*"],
            "services": ["dynamodb"]
        },
        "reset_boto3_session": True,
    },
    "iam": {"load_aws_managed_policies": False},
    "stepfunctions": {"execute_state_machine": True},
})
```

### 2.9.1 Dockerless Services

By default, Batch and AWSLambda will spin up a Docker image to execute the provided scripts and functions.

If you configure *use_docker: False* for either of these services, the scripts and functions will not be executed, and Moto will assume a successful invocation.

### 2.9.2 Passthrough Requests

Configure *mock_credentials: False* and *passthrough* if you want to only mock some services, but allow other requests to connect to AWS.

You can either passthrough all requests to a specific service, or all URL's that match a specific pattern.

### 2.9.3 Reset Boto Session

When creating boto3-client for the first time, *boto3* will create a default session that caches all kinds of things - including credentials. Subsequent boto3-clients will reuse that *Session*.

If the first test in your test suite is mocked, the default *Session* created in that test will have fake credentials, as supplied by Moto. But if the next test is not mocked and should reach out to AWS, it would do so with the mocked credentials from our cached *Session*.

That is why Moto resets the *boto3-Session*, to make sure that it is recreated with the correct credentials (either fake or mocked) everytime. It does come at a cost though, as instantiating a new boto3-Session is an expensive operation.

If all of your tests use Moto, and you never want to reach out to AWS, you can choose to _not_ reset the *boto3-session*. New boto3-clients that are created will reuse the *boto3-Session* (with fake credentials), making Moto much more performant.

### 2.9.4 AWS Managed Policies

Moto comes bundled with all Managed Policies that AWS exposes, which are updated regularly. However, they are not loaded unless specifically requested for performance reasons.

Set *"iam": {"load_aws_managed_policies": True}* to load these policies for a single test.

### 2.9.5 Configuring MotoServer

The following options can also be configured when running the MotoServer:

```
options = {
    "batch": {"use_docker": True},
    "lambda": {"use_docker": True},
    "stepfunctions": {"execute_state_machine": True}
}
requests.post(f"http://localhost:5000/moto-api/config", json=options)
```

Send a GET request to see the current status of this configuration:

```
requests.get(f"http://localhost:5000/moto-api/config").json()
```

The IAM Managed Policies should be loaded with an environment variable:

```
MOTO_IAM_LOAD_MANAGED_POLICIES=true
```

### 2.9.6 Other configuration options

#### Environment Variables

The following is a non-exhaustive list of the environment variables that can be used to configure Moto.

| Key | Valu | De-fault | Explanation |
|---|---|---|---|
| TEST_SERVER_MOD | bool | False | Useful when you want to run decorated tests against an existing Moto-Server. All boto3-clients/resources created within the test will point to *http://localhost:5000*. |
| INI-TIAL_NO_AUTH_AC | int | 0 | See *IAM-like Access Control*. |
| DE-FAULT_CONTAINER | str | docke | Registry that contains the Docker containers. Used by AWSLambda and Batch. |
| MOTO_ALLOW_NON | bool | False | |
| MOTO_ENABLE_ISO | bool | False | Enable the mocking of ISO regions (ISO, ISO-B, ISO-E, ISO-F) |
| | | | |
| MOTO_EVENTS_INV | str | | See *events*. |
| MOTO_S3_CUSTOM | str | | See *s3*. |
| MOTO_PRETTIFY_R | bool | False | Prettify responses from Moto, making it easier to read and debug. |

### Recorder

The Moto Recorder is used to log all incoming requests, which can be replayed at a later date. This is useful if you need to setup an initial state, and ensure that this is the same across developers/environments.

### Usage

Usage in decorator mode:

```
from moto.moto_api import recorder

# Start the recorder
recorder.start_recording()
# Make some requests using boto3

# When you're ready..
recorder.stop_recording()
log = recorder.download_recording()

# Later on, upload this log to another system
recorder.upload_recording(log)
# And replay the contents
recorder.replay_recording()

# While the recorder is active, new requests will be appended to the existing log
# Reset the current log if you want to start with an empty slate
recorder.reset_recording()
```

Usage in ServerMode:

```
# Start the recorder
requests.post("http://localhost:5000/moto-api/recorder/start-recording")
# Make some requests

# When you're ready..
requests.post("http://localhost:5000/moto-api/recorder/stop-recording")
log = requests.get("http://localhost:5000/moto-api/recorder/download-recording").content

# Later on, upload this log to another system
requests.post("http://localhost:5000/moto-api/recorder/upload-recording", data=log)
# and replay the contents
requests.post("http://localhost:5000/moto-api/recorder/replay-recording")

# While the recorder is active, new requests will be appended to the existing log
# Reset the current log if you want to start with an empty slate
requests.post("http://localhost:5000/moto-api/recorder/reset-recording")
```

Note that this feature records and replays the incoming HTTP request. Randomized data created by Moto, such as resource ID's, will not be stored as part of the log.

### Recorder Configuration

The requests are stored in a file called *moto_recording*, in the directory that Python is run from. You can configure this location using the following environment variable: *MOTO_RECORDER_FILEPATH=/whatever/path/you/want*

The recorder is disabled by default. If you want to enable it, use the following environment variable: *MOTO_ENABLE_RECORDING=True*

### Deterministic Identifiers

Moto creates random identifiers for most resources, just like AWS. The Recorder will recreate the same resources every time, but with different identifiers.

It is possible to seed Moto and ensure that the 'random' identifiers are always the same for subsequent requests.

Example invocation:

```
# Ensure the provided parameter `a` is an integer
requests.post("http://motoapi.amazonaws.com/moto-api/seed?a=42")

# To try this out, generate a EC2 instance
client = boto3.client("ec2", region_name="us-east-1")
resp = client.run_instances(ImageId="ami-12c6146b", MinCount=1, MaxCount=1)

# The resulting InstanceId will always be the same
instance_id = resp["Instances"][0]["InstanceId"]
assert instance_id == "i-d1026706d7e805da8"
```

To seed Moto in ServerMode:

```
requests.post(f"http://localhost:5000/moto-api/seed?a=42")
```

Because the seeding API is only exposed as a request, it will be recorded just like any other request. Seed Moto at the beginning of a recording to ensure the resulting state will always be the same:

```
requests.post("http://localhost:5000/moto-api/recorder/start-recording")
requests.post("http://localhost:5000/moto-api/seed?a=42")

client = boto3.client("ec2", region_name="us-east-1")
resp = client.run_instances(ImageId="ami-12c6146b", MinCount=1, MaxCount=1)

requests.post("http://localhost:5000/moto-api/recorder/stop-recording")
```

### State Transitions

When developing against AWS, many API calls are asynchronous. Many resources will take some time to complete, and you'll need to write business logic to ensure the application can deal with all possible states. What is the desired behaviour when the status is *initializing*? What should happen when the status is finally *ready*? What should happen when the resource is still not *ready* after an hour?

Let's look at an example. Say you want to create a DAX cluster, and wait until it's available - or throw an error if this takes too long.

```
def create_and_wait_for_cluster(name):
    client.create_cluster(ClusterName=name, ...)

    cluster_status = get_cluster_status(name)
    while cluster_status != "available":
        sleep()

        if five_minutes_have_passed():
            error()

        cluster_status = get_cluster_status(name)
```

Because Moto handles everything in-memory, and no actual servers are created, there is no need to wait until the cluster is ready - it could be ready immediately. Not having to wait for a resource to be ready is of course the major benefit of using Moto, but it also means that the entire example above is impossible to test.

Moto exposes an API that can artificially delay these state transitions, allowing you to let Moto resemble the asynchronous nature of AWS as closely as you need.

Sticking with the example above, you may want to test what happens if the cluster takes 5 seconds to create:

```
from moto.moto_api import state_manager

state_manager.set_transition(model_name="dax::cluster", transition={"progression": "time
↪", "seconds": 5})

create_and_wait_for_cluster("my_new_cluster")
```

In order to test what happens in the event of a timeout, we can order the cluster to only be ready after 10 minutes:

```
from moto.moto_api import state_manager

state_manager.set_transition(model_name="dax::cluster", transition={"progression": "time
↪", "seconds": 600})

try:
    create_and_wait_for_cluster("my_new_cluster")
except:
    verify_the_correct_error_was_thrown()
```

In other tests, you may simply want the cluster to be ready as quickly as possible:

```
from moto.moto_api import state_manager

state_manager.set_transition(model_name="dax::cluster", transition={"progression":
↪"immediate"})
```

**So far we've seen two possible transitions:**

- The state progresses immediately
- The state progresses after x seconds

There is a third possibility, where the state progresses after calling *describe_object* a specific number of times. This can be useful if you want to verify that the state does change, but you don't want your unit test to take too long.

**Note:** We will use the *boto3.client(..).describe_object* method as an example throughout this page. This should be seen as a agnostic version of service-specific methods to verify the status of a resource, such as *boto.client("dax").describe_clusters()* or *boto.client("support").describe_cases()*.

Changing the state after a certain number of invocations can be done like this:

```
state_manager.set_transition(model_name="dax::cluster", transition={"progression":
↪"manual", "times": 3})
```

The transition is called *manual* because it requires you to manually invoke the *describe_object*-method before the status is progressed. To show how this would work in practice, let's look at an example test:

```
client.create_cluster(ClusterName=name, ...)
# The first time we retrieve the status
status = client.describe_clusters(ClusterNames=[name])["Clusters"][0]["Status"]
assert status == "creating"
# Second time we retrieve the status
status = client.describe_clusters(ClusterNames=[name])["Clusters"][0]["Status"]
assert status == "creating"
# This is the third time that we're retrieving the status - this time it will advance to␣
↪the next status
status = client.describe_clusters(ClusterNames=[name])["Clusters"][0]["Status"]
assert status == "available"
```

This should be done cleanly in a while-loop of-course, similar to the *create_and_wait_for_cluster* defined above - but this is a good way to showcase the behaviour.

### Registered models

*A list of all supported models can be found here.*

Older versions of Moto may not support all models that are listed here. To see a list of supported models for your Moto-version, call the *get_registered_models*-method:

```
with mock_all():
    print(state_manager.get_registered_models())
```

Note the *mock_all*-decorator! Models are registered when the mock for that resource is started. If you call this method outside of a mock, you may see an empty list.

If you'd like to see state transition support for a resource that's not yet supported, feel free to open an issue or PR.

### State Transitions in ServerMode

Configuration state transitions can be done in ServerMode as well, by making a HTTP request to the MotoAPI. This is an example request for *dax::cluster* to wait 5 seconds before the cluster becomes ready:

```
post_body = dict(model_name="dax::cluster", transition={"progression": "time", "seconds
↪": 5})
resp = requests.post("http://localhost:5000/moto-api/state-manager/set-transition",␣
↪data=json.dumps(post_body))
```

An example request to see the currently configured transition for a specific model:

```
requests.get("http://localhost:5000/moto-api/state-manager/get-transition?model_
↪name=dax::cluster")
```

We will not list all configuration options here again, but all models and transitions types (as specified above) follow the same format.

#### Reset

It is possible to reset the state manager, and undo any custom transitions that were set. Using Python:

```
from moto.moto_api import state_manager

state_manager.unset_transition(model_name="dax::cluster")
```

Or if you're using Moto in ServerMode:

```
post_body = dict(model_name="dax::cluster")
resp = requests.post("http://localhost:5000/moto-api/state-manager/unset-transition",␣
↪data=json.dumps(post_body))
```

### Supported Models for State Transitions

#### Service: Batch

**Model**: *batch::job* Available States:

> "SUBMITTED" –> "PENDING" –> "RUNNABLE" –> "STARTING" –> "RUNNING" "RUNNING" –> SUCCEEDED|FAILED

Transition type: *immediate* Advancement:

> When a user calls *submit_job*, Moto will go through a few steps to prepare the job, and when ready, execute that job in a Docker container. There are some steps to go through while the status is *SUBMITTED*, there are some steps to follow when the status is *PENDING*, etcetera.
>
> Moto will try to advance the status itself - the moment this succeeds, the next step is executed. As the default transition is *immediate*, the status will advance immediately, and these steps will be executed as quickly as possible. This ensures that the job will be executed as quickly as possible.
>
> Delaying the execution can be done as usual, by forcing Moto to wait x seconds before transitioning to the next stage. This can be useful if you need to 'catch' a job in a specific stage.

#### Service: Cloudfront

**Model**: *cloudfront::distribution* Available States:

> "InProgress" –> "Deployed"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

> Call *boto3.client("cloudfront").get_distribution(..)* to advance a single distribution, or *boto3.client("cloudfront").list_distributions(..)* to advance all distributions.

### Service: DAX

**Model**: *dax::cluster* Available States:

"creating" –> "available" "deleting" –> "deleted"

Transition type: Manual - describe the resource 4 times before the state advances Advancement:

Call *boto3.client("dax").describe_clusters(..)*.

### Service: Glue

**Model**: *glue::job_run* Available States:

"STARTING" –> "RUNNING" –> "SUCCEEDED"

Transition type: *immediate* Advancement:

Call *boto3.client("glue").get_job_run(..)*

### Service: S3 (Glacier Restoration)

**Model**: *s3::keyrestore* Available States:

None –> "IN_PROGRESS" –> "RESTORED"

Transition type: Immediate - transitions immediately

### Service: Support

**Model**: *support::case* Available states:

"opened" –> "pending-customer-action" –> "reopened" –> "resolved" –> "unassigned" –> "work-in-progress" –> "opened"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

Call *boto3.client("support").describe_cases(..)*

### Service: Transcribe

**Model**: *transcribe::vocabulary* Available states:

None –> "PENDING –> "READY"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

Call *boto3.client("transcribe").get_vocabulary(..)*

**Model**: *transcribe::medicalvocabulary* Available states:

None –> "PENDING –> "READY"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

Call *boto3.client("transcribe").get_medical_vocabulary(..)*

**Model**: *transcribe::transcriptionjob* Available states:

None –> "QUEUED" –> "IN_PROGRESS" –> "COMPLETED"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

Call *boto3.client("transcribe").get_transcription_job(..)*

**Model**: *transcribe::medicaltranscriptionjob* Available states:

None –> "QUEUED" –> "IN_PROGRESS" –> "COMPLETED"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

Call *boto3.client("transcribe").get_medical_transcription_job(..)*

#### Service: ECS

**Model**: *ecs::task* Available states:

"RUNNING" –> "DEACTIVATING" –> "STOPPING" –> "DEPROVISIONING" –> "STOPPED"

Transition type: Manual - describe the resource 1 time before the state advances Advancement:

Call *boto3.client("ecs").describe_tasks(..)*

## 2.10 Implemented Services

Please see a list of all currently supported services. Each service will have a list of the endpoints that are implemented.

### 2.10.1 acm

Implemented features for this service

- [X] add_tags_to_certificate
- [X] delete_certificate
- [X] describe_certificate
- [X] export_certificate
- [ ] get_account_configuration
- [X] get_certificate
- [X] import_certificate
- [X] list_certificates
- [ ] list_tags_for_certificate
- [ ] put_account_configuration
- [X] remove_tags_from_certificate
- [ ] renew_certificate
- [X] request_certificate

  The parameter DomainValidationOptions has not yet been implemented
- [ ] resend_validation_email
- [ ] update_certificate_options

### 2.10.2 acm-pca

**class** moto.acmpca.models.**ACMPCABackend**(*region_name: str*, *account_id: str*)

Implementation of ACMPCA APIs.

Implemented features for this service

- [X] create_certificate_authority

  The following parameters are not yet implemented: IdempotencyToken, KeyStorageSecurityStandard, UsageMode

- [ ] create_certificate_authority_audit_report
- [ ] create_permission
- [X] delete_certificate_authority
- [ ] delete_permission
- [ ] delete_policy
- [X] describe_certificate_authority
- [ ] describe_certificate_authority_audit_report
- [X] get_certificate

  The CertificateChain will always return None for now

- [X] get_certificate_authority_certificate
- [X] get_certificate_authority_csr
- [ ] get_policy
- [X] import_certificate_authority_certificate
- [X] issue_certificate

  The following parameters are not yet implemented: ApiPassthrough, SigningAlgorithm, TemplateArn, Validity, ValidityNotBefore, IdempotencyToken Some fields of the resulting certificate will have default values, instead of using the CSR

- [ ] list_certificate_authorities
- [ ] list_permissions
- [X] list_tags

  Pagination is not yet implemented

- [ ] put_policy
- [ ] restore_certificate_authority
- [X] revoke_certificate

  This is currently a NO-OP

- [X] tag_certificate_authority
- [X] untag_certificate_authority
- [X] update_certificate_authority

### 2.10.3 amp

**class** moto.amp.models.**PrometheusServiceBackend**(*region_name: str*, *account_id: str*)

Implementation of PrometheusService APIs.

Implemented features for this service

- [ ] create_alert_manager_definition
- [X] create_logging_configuration
- [X] create_rule_groups_namespace

  The ClientToken-parameter is not yet implemented
- [ ] create_scraper
- [X] create_workspace

  The ClientToken-parameter is not yet implemented
- [ ] delete_alert_manager_definition
- [X] delete_logging_configuration
- [X] delete_rule_groups_namespace

  The ClientToken-parameter is not yet implemented
- [ ] delete_scraper
- [X] delete_workspace

  The ClientToken-parameter is not yet implemented
- [ ] describe_alert_manager_definition
- [X] describe_logging_configuration
- [X] describe_rule_groups_namespace
- [ ] describe_scraper
- [X] describe_workspace
- [ ] get_default_scraper_configuration
- [X] list_rule_groups_namespaces
- [ ] list_scrapers
- [X] list_tags_for_resource
- [X] list_workspaces
- [ ] put_alert_manager_definition
- [X] put_rule_groups_namespace

  The ClientToken-parameter is not yet implemented
- [X] tag_resource
- [X] untag_resource
- [X] update_logging_configuration
- [X] update_workspace_alias

  The ClientToken-parameter is not yet implemented

### 2.10.4 apigateway

class moto.apigateway.models.**APIGatewayBackend**(*region_name: str*, *account_id: str*)

API Gateway mock.

The public URLs of an API integration are mocked as well, i.e. the following would be supported in Moto:

```
client.put_integration(
    restApiId=api_id,
    ...,
    uri="http://httpbin.org/robots.txt",
    integrationHttpMethod="GET"
)
deploy_url = f"https://{api_id}.execute-api.us-east-1.amazonaws.com/dev"
assert requests.get(deploy_url).content == b"a fake response"
```

**Limitations:**

- Integrations of type HTTP are supported
- Integrations of type AWS with service DynamoDB are supported
- Other types (AWS_PROXY, MOCK, etc) are ignored
- Other services are not yet supported
- The BasePath of an API is ignored
- TemplateMapping is not yet supported for requests/responses
- This only works when using the decorators, not in ServerMode

Implemented features for this service

- [X] create_api_key
- [X] create_authorizer
- [X] create_base_path_mapping
- [X] create_deployment
- [ ] create_documentation_part
- [ ] create_documentation_version
- [X] create_domain_name
- [X] create_model
- [X] create_request_validator
- [X] create_resource
- [X] create_rest_api
- [X] create_stage
- [X] create_usage_plan
- [X] create_usage_plan_key
- [X] create_vpc_link
- [X] delete_api_key

- [X] delete_authorizer
- [X] delete_base_path_mapping
- [ ] delete_client_certificate
- [X] delete_deployment
- [ ] delete_documentation_part
- [ ] delete_documentation_version
- [X] delete_domain_name
- [X] delete_gateway_response
- [X] delete_integration
- [X] delete_integration_response
- [X] delete_method
- [X] delete_method_response
- [ ] delete_model
- [X] delete_request_validator
- [X] delete_resource
- [X] delete_rest_api
- [X] delete_stage
- [X] delete_usage_plan
- [X] delete_usage_plan_key
- [X] delete_vpc_link
- [ ] flush_stage_authorizers_cache
- [ ] flush_stage_cache
- [ ] generate_client_certificate
- [ ] get_account
- [X] get_api_key
- [X] get_api_keys
- [X] get_authorizer
- [X] get_authorizers
- [X] get_base_path_mapping
- [X] get_base_path_mappings
- [ ] get_client_certificate
- [ ] get_client_certificates
- [X] get_deployment
- [X] get_deployments
- [ ] get_documentation_part
- [ ] get_documentation_parts

- [ ] get_documentation_version
- [ ] get_documentation_versions
- [X] get_domain_name
- [X] get_domain_names
- [ ] get_export
- [X] get_gateway_response
- [X] get_gateway_responses

  Pagination is not yet implemented
- [X] get_integration
- [X] get_integration_response
- [X] get_method
- [X] get_method_response
- [X] get_model
- [ ] get_model_template
- [X] get_models
- [X] get_request_validator
- [X] get_request_validators
- [X] get_resource
- [X] get_resources
- [X] get_rest_api
- [ ] get_rest_apis
- [ ] get_sdk
- [ ] get_sdk_type
- [ ] get_sdk_types
- [X] get_stage
- [X] get_stages
- [ ] get_tags
- [ ] get_usage
- [X] get_usage_plan
- [X] get_usage_plan_key
- [X] get_usage_plan_keys
- [X] get_usage_plans
- [X] get_vpc_link
- [X] get_vpc_links

  Pagination has not yet been implemented
- [ ] import_api_keys

- [ ] import_documentation_parts
- [X] import_rest_api

  Only a subset of the OpenAPI spec 3.x is currently implemented.
- [X] put_gateway_response
- [X] put_integration
- [X] put_integration_response
- [X] put_method
- [X] put_method_response
- [X] put_rest_api

  Only a subset of the OpenAPI spec 3.x is currently implemented.
- [ ] tag_resource
- [ ] test_invoke_authorizer
- [ ] test_invoke_method
- [ ] untag_resource
- [ ] update_account
- [X] update_api_key
- [X] update_authorizer
- [X] update_base_path_mapping
- [ ] update_client_certificate
- [ ] update_deployment
- [ ] update_documentation_part
- [ ] update_documentation_version
- [ ] update_domain_name
- [ ] update_gateway_response
- [ ] update_integration
- [ ] update_integration_response
- [ ] update_method
- [ ] update_method_response
- [ ] update_model
- [X] update_request_validator
- [ ] update_resource
- [X] update_rest_api
- [X] update_stage
- [ ] update_usage
- [X] update_usage_plan

The following PatchOperations are currently supported: add : Everything except /apiStages/{apidId:stageName}/throttle/ and children replace: Everything except /apiStages/{apidId:stageName}/throttle/ and children remove : Everything except /apiStages/{apidId:stageName}/throttle/ and children copy : Nothing yet

- [ ] update_vpc_link

### 2.10.5 apigatewaymanagementapi

**class** moto.apigatewaymanagementapi.models.**ApiGatewayManagementApiBackend**(*region_name: str*, *account_id: str*)

Connecting to this API in ServerMode/Docker requires Python >= 3.8 and an up-to-date *werkzeug* version (>=2.3.x)

Implemented features for this service

- [X] delete_connection
- [X] get_connection
- [X] post_to_connection

### 2.10.6 apigatewayv2

**class** moto.apigatewayv2.models.**ApiGatewayV2Backend**(*region_name: str*, *account_id: str*)

Implementation of ApiGatewayV2 APIs.

Implemented features for this service

- [X] create_api

  The following parameters are not yet implemented: CredentialsArn, RouteKey, Tags, Target
- [X] create_api_mapping
- [X] create_authorizer
- [ ] create_deployment
- [X] create_domain_name
- [X] create_integration
- [X] create_integration_response
- [X] create_model
- [X] create_route
- [X] create_route_response

  The following parameters are not yet implemented: ResponseModels, ResponseParameters
- [X] create_stage
- [X] create_vpc_link
- [ ] delete_access_log_settings
- [X] delete_api
- [X] delete_api_mapping

- [X] delete_authorizer
- [X] delete_cors_configuration
- [ ] delete_deployment
- [X] delete_domain_name
- [X] delete_integration
- [X] delete_integration_response
- [X] delete_model
- [X] delete_route
- [X] delete_route_request_parameter
- [X] delete_route_response
- [ ] delete_route_settings
- [X] delete_stage
- [X] delete_vpc_link
- [ ] export_api
- [X] get_api
- [X] get_api_mapping
- [X] get_api_mappings
- [X] get_apis

  Pagination is not yet implemented
- [X] get_authorizer
- [ ] get_authorizers
- [ ] get_deployment
- [ ] get_deployments
- [X] get_domain_name
- [X] get_domain_names

  Pagination is not yet implemented
- [X] get_integration
- [X] get_integration_response
- [X] get_integration_responses
- [X] get_integrations

  Pagination is not yet implemented
- [X] get_model
- [ ] get_model_template
- [ ] get_models
- [X] get_route
- [X] get_route_response

- [ ] get_route_responses
- [X] get_routes

  Pagination is not yet implemented
- [X] get_stage
- [X] get_stages
- [X] get_tags
- [X] get_vpc_link
- [X] get_vpc_links
- [ ] import_api
- [X] reimport_api

  Only YAML is supported at the moment. Full OpenAPI-support is not guaranteed. Only limited validation is implemented
- [ ] reset_authorizers_cache
- [X] tag_resource
- [X] untag_resource
- [X] update_api

  The following parameters have not yet been implemented: CredentialsArn, RouteKey, Target
- [ ] update_api_mapping
- [X] update_authorizer
- [ ] update_deployment
- [ ] update_domain_name
- [X] update_integration
- [X] update_integration_response
- [X] update_model
- [X] update_route
- [ ] update_route_response
- [ ] update_stage
- [X] update_vpc_link

### 2.10.7 appconfig

**class** moto.appconfig.models.**AppConfigBackend**(*region_name: str*, *account_id: str*)

Implementation of AppConfig APIs.

Implemented features for this service

- [X] create_application
- [X] create_configuration_profile
- [ ] create_deployment_strategy

- [ ] create_environment
- [ ] create_extension
- [ ] create_extension_association
- [X] create_hosted_configuration_version

  The LatestVersionNumber-parameter is not yet implemented
- [X] delete_application
- [X] delete_configuration_profile
- [ ] delete_deployment_strategy
- [ ] delete_environment
- [ ] delete_extension
- [ ] delete_extension_association
- [X] delete_hosted_configuration_version
- [X] get_application
- [ ] get_configuration
- [X] get_configuration_profile
- [ ] get_deployment
- [ ] get_deployment_strategy
- [ ] get_environment
- [ ] get_extension
- [ ] get_extension_association
- [X] get_hosted_configuration_version
- [ ] list_applications
- [X] list_configuration_profiles
- [ ] list_deployment_strategies
- [ ] list_deployments
- [ ] list_environments
- [ ] list_extension_associations
- [ ] list_extensions
- [ ] list_hosted_configuration_versions
- [X] list_tags_for_resource
- [ ] start_deployment
- [ ] stop_deployment
- [X] tag_resource
- [X] untag_resource
- [X] update_application
- [X] update_configuration_profile

- [ ] update_deployment_strategy
- [ ] update_environment
- [ ] update_extension
- [ ] update_extension_association
- [ ] validate_configuration

### 2.10.8 application-autoscaling

Implemented features for this service

- [X] delete_scaling_policy
- [X] delete_scheduled_action
- [X] deregister_scalable_target
- [X] describe_scalable_targets
- [ ] describe_scaling_activities
- [X] describe_scaling_policies
- [X] describe_scheduled_actions

  Pagination is not yet implemented
- [ ] list_tags_for_resource
- [X] put_scaling_policy
- [X] put_scheduled_action
- [X] register_scalable_target
- [ ] tag_resource
- [ ] untag_resource

### 2.10.9 appsync

**class** moto.appsync.models.**AppSyncBackend**(*region_name: str*, *account_id: str*)

Implementation of AppSync APIs.

Implemented features for this service

- [ ] associate_api
- [ ] associate_merged_graphql_api
- [ ] associate_source_graphql_api
- [ ] create_api_cache
- [X] create_api_key
- [ ] create_data_source
- [ ] create_domain_name
- [ ] create_function
- [X] create_graphql_api

- [ ] create_resolver
- [ ] create_type
- [ ] delete_api_cache
- [X] delete_api_key
- [ ] delete_data_source
- [ ] delete_domain_name
- [ ] delete_function
- [X] delete_graphql_api
- [ ] delete_resolver
- [ ] delete_type
- [ ] disassociate_api
- [ ] disassociate_merged_graphql_api
- [ ] disassociate_source_graphql_api
- [ ] evaluate_code
- [ ] evaluate_mapping_template
- [ ] flush_api_cache
- [ ] get_api_association
- [ ] get_api_cache
- [ ] get_data_source
- [ ] get_data_source_introspection
- [ ] get_domain_name
- [ ] get_function
- [X] get_graphql_api
- [ ] get_graphql_api_environment_variables
- [ ] get_introspection_schema
- [ ] get_resolver
- [X] get_schema_creation_status
- [ ] get_source_api_association
- [X] get_type
- [X] list_api_keys

  Pagination or the maxResults-parameter have not yet been implemented.
- [ ] list_data_sources
- [ ] list_domain_names
- [ ] list_functions
- [X] list_graphql_apis

  Pagination or the maxResults-parameter have not yet been implemented.

- [ ] list_resolvers
- [ ] list_resolvers_by_function
- [ ] list_source_api_associations
- [X] list_tags_for_resource
- [ ] list_types
- [ ] list_types_by_association
- [ ] put_graphql_api_environment_variables
- [ ] start_data_source_introspection
- [X] start_schema_creation
- [ ] start_schema_merge
- [X] tag_resource
- [X] untag_resource
- [ ] update_api_cache
- [X] update_api_key
- [ ] update_data_source
- [ ] update_domain_name
- [ ] update_function
- [X] update_graphql_api
- [ ] update_resolver
- [ ] update_source_api_association
- [ ] update_type

### 2.10.10 athena

Implemented features for this service

- [ ] batch_get_named_query
- [ ] batch_get_prepared_statement
- [ ] batch_get_query_execution
- [ ] cancel_capacity_reservation
- [ ] create_capacity_reservation
- [X] create_data_catalog
- [X] create_named_query
- [ ] create_notebook
- [X] create_prepared_statement
- [ ] create_presigned_notebook_url
- [X] create_work_group
- [ ] delete_capacity_reservation

- [ ] delete_data_catalog
- [ ] delete_named_query
- [ ] delete_notebook
- [ ] delete_prepared_statement
- [ ] delete_work_group
- [ ] export_notebook
- [ ] get_calculation_execution
- [ ] get_calculation_execution_code
- [ ] get_calculation_execution_status
- [ ] get_capacity_assignment_configuration
- [ ] get_capacity_reservation
- [X] get_data_catalog
- [ ] get_database
- [X] get_named_query
- [ ] get_notebook_metadata
- [X] get_prepared_statement
- [X] get_query_execution
- [X] get_query_results

  Queries are not executed by Moto, so this call will always return 0 rows by default.

  You can use a dedicated API to override this, by configuring a queue of expected results.

  A request to *get_query_results* will take the first result from that queue, and assign it to the provided QueryExecutionId. Subsequent requests using the same QueryExecutionId will return the same result. Other requests using a different QueryExecutionId will take the next result from the queue, or return an empty result if the queue is empty.

  Configuring this queue by making an HTTP request to */moto-api/static/athena/query-results*. An example invocation looks like this:

```
expected_results = {
    "account_id": "123456789012",  # This is the default - can be omitted
    "region": "us-east-1",  # This is the default - can be omitted
    "results": [
        {
            "rows": [{"Data": [{"VarCharValue": "1"}]}],
            "column_info": [{
                "CatalogName": "string",
                "SchemaName": "string",
                "TableName": "string",
                "Name": "string",
                "Label": "string",
                "Type": "string",
                "Precision": 123,
                "Scale": 123,
                "Nullable": "NOT_NULL",
```

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```
                "CaseSensitive": True,
            }],
        },
        # other results as required
    ],
}
resp = requests.post(
    "http://motoapi.amazonaws.com/moto-api/static/athena/query-results",
    json=expected_results,
)
assert resp.status_code == 201

client = boto3.client("athena", region_name="us-east-1")
details = client.get_query_execution(QueryExecutionId="any_id")[
↪"QueryExecution"]
```

**Note:** The exact QueryExecutionId is not relevant here, but will likely be whatever value is returned by start_query_execution

- [ ] get_query_runtime_statistics
- [ ] get_session
- [ ] get_session_status
- [ ] get_table_metadata
- [X] get_work_group
- [ ] import_notebook
- [ ] list_application_dpu_sizes
- [ ] list_calculation_executions
- [ ] list_capacity_reservations
- [X] list_data_catalogs
- [ ] list_databases
- [ ] list_engine_versions
- [ ] list_executors
- [X] list_named_queries
- [ ] list_notebook_metadata
- [ ] list_notebook_sessions
- [ ] list_prepared_statements
- [X] list_query_executions
- [ ] list_sessions
- [ ] list_table_metadata
- [ ] list_tags_for_resource
- [X] list_work_groups

- [ ] put_capacity_assignment_configuration
- [ ] start_calculation_execution
- [X] start_query_execution
- [ ] start_session
- [ ] stop_calculation_execution
- [X] stop_query_execution
- [ ] tag_resource
- [ ] terminate_session
- [ ] untag_resource
- [ ] update_capacity_reservation
- [ ] update_data_catalog
- [ ] update_named_query
- [ ] update_notebook
- [ ] update_notebook_metadata
- [ ] update_prepared_statement
- [ ] update_work_group

### 2.10.11 autoscaling

Implemented features for this service

- [X] attach_instances
- [X] attach_load_balancer_target_groups
- [X] attach_load_balancers
- [ ] attach_traffic_sources
- [X] batch_delete_scheduled_action
- [X] batch_put_scheduled_update_group_action
- [ ] cancel_instance_refresh
- [ ] complete_lifecycle_action
- [X] create_auto_scaling_group
- [X] create_launch_configuration
- [X] create_or_update_tags
- [X] delete_auto_scaling_group
- [X] delete_launch_configuration
- [X] delete_lifecycle_hook
- [ ] delete_notification_configuration
- [X] delete_policy
- [X] delete_scheduled_action

- [X] delete_tags
- [X] delete_warm_pool
- [ ] describe_account_limits
- [ ] describe_adjustment_types
- [X] describe_auto_scaling_groups
- [X] describe_auto_scaling_instances
- [ ] describe_auto_scaling_notification_types
- [ ] describe_instance_refreshes
- [X] describe_launch_configurations
- [ ] describe_lifecycle_hook_types
- [X] describe_lifecycle_hooks
- [X] describe_load_balancer_target_groups
- [X] describe_load_balancers
- [ ] describe_metric_collection_types
- [ ] describe_notification_configurations
- [X] describe_policies
- [ ] describe_scaling_activities
- [ ] describe_scaling_process_types
- [X] describe_scheduled_actions
- [X] describe_tags

  Pagination is not yet implemented.
- [ ] describe_termination_policy_types
- [ ] describe_traffic_sources
- [X] describe_warm_pool

  Pagination is not yet implemented. Does not create/return any Instances currently.
- [X] detach_instances
- [X] detach_load_balancer_target_groups
- [X] detach_load_balancers
- [ ] detach_traffic_sources
- [ ] disable_metrics_collection
- [X] enable_metrics_collection
- [ ] enter_standby
- [X] execute_policy
- [ ] exit_standby
- [ ] get_predictive_scaling_forecast
- [ ] put_lifecycle_hook

- [ ] put_notification_configuration
- [X] put_scaling_policy
- [X] put_scheduled_update_group_action
- [X] put_warm_pool
- [ ] record_lifecycle_action_heartbeat
- [X] resume_processes
- [ ] rollback_instance_refresh
- [X] set_desired_capacity
- [X] set_instance_health

  The ShouldRespectGracePeriod-parameter is not yet implemented
- [X] set_instance_protection
- [ ] start_instance_refresh
- [X] suspend_processes
- [ ] terminate_instance_in_auto_scaling_group
- [X] update_auto_scaling_group

  The parameter DefaultCooldown, PlacementGroup, TerminationPolicies are not yet implemented

### 2.10.12 backup

**class** moto.backup.models.**BackupBackend**(*region_name: str*, *account_id: str*)

Implementation of Backup APIs.

Implemented features for this service

- [ ] cancel_legal_hold
- [X] create_backup_plan
- [ ] create_backup_selection
- [X] create_backup_vault
- [ ] create_framework
- [ ] create_legal_hold
- [ ] create_logically_air_gapped_backup_vault
- [ ] create_report_plan
- [ ] create_restore_testing_plan
- [ ] create_restore_testing_selection
- [X] delete_backup_plan
- [ ] delete_backup_selection
- [ ] delete_backup_vault
- [ ] delete_backup_vault_access_policy
- [ ] delete_backup_vault_lock_configuration

- [ ] delete_backup_vault_notifications
- [ ] delete_framework
- [ ] delete_recovery_point
- [ ] delete_report_plan
- [ ] delete_restore_testing_plan
- [ ] delete_restore_testing_selection
- [ ] describe_backup_job
- [ ] describe_backup_vault
- [ ] describe_copy_job
- [ ] describe_framework
- [ ] describe_global_settings
- [ ] describe_protected_resource
- [ ] describe_recovery_point
- [ ] describe_region_settings
- [ ] describe_report_job
- [ ] describe_report_plan
- [ ] describe_restore_job
- [ ] disassociate_recovery_point
- [ ] disassociate_recovery_point_from_parent
- [ ] export_backup_plan_template
- [X] get_backup_plan
- [ ] get_backup_plan_from_json
- [ ] get_backup_plan_from_template
- [ ] get_backup_selection
- [ ] get_backup_vault_access_policy
- [ ] get_backup_vault_notifications
- [ ] get_legal_hold
- [ ] get_recovery_point_restore_metadata
- [ ] get_restore_job_metadata
- [ ] get_restore_testing_inferred_metadata
- [ ] get_restore_testing_plan
- [ ] get_restore_testing_selection
- [ ] get_supported_resource_types
- [ ] list_backup_job_summaries
- [ ] list_backup_jobs
- [ ] list_backup_plan_templates

- [ ] list_backup_plan_versions
- [X] list_backup_plans

  Pagination is not yet implemented
- [ ] list_backup_selections
- [X] list_backup_vaults

  Pagination is not yet implemented
- [ ] list_copy_job_summaries
- [ ] list_copy_jobs
- [ ] list_frameworks
- [ ] list_legal_holds
- [ ] list_protected_resources
- [ ] list_protected_resources_by_backup_vault
- [ ] list_recovery_points_by_backup_vault
- [ ] list_recovery_points_by_legal_hold
- [ ] list_recovery_points_by_resource
- [ ] list_report_jobs
- [ ] list_report_plans
- [ ] list_restore_job_summaries
- [ ] list_restore_jobs
- [ ] list_restore_jobs_by_protected_resource
- [ ] list_restore_testing_plans
- [ ] list_restore_testing_selections
- [X] list_tags

  Pagination is not yet implemented
- [ ] put_backup_vault_access_policy
- [ ] put_backup_vault_lock_configuration
- [ ] put_backup_vault_notifications
- [ ] put_restore_validation_result
- [ ] start_backup_job
- [ ] start_copy_job
- [ ] start_report_job
- [ ] start_restore_job
- [ ] stop_backup_job
- [X] tag_resource
- [X] untag_resource
- [ ] update_backup_plan

- [ ] update_framework
- [ ] update_global_settings
- [ ] update_recovery_point_lifecycle
- [ ] update_region_settings
- [ ] update_report_plan
- [ ] update_restore_testing_plan
- [ ] update_restore_testing_selection

### 2.10.13 batch

**class** moto.batch.models.**BatchBackend**(*region_name: str*, *account_id: str*)

Batch-jobs are executed inside a Docker-container. Everytime the *submit_job*-method is called, a new Docker container is started. A job is marked as 'Success' when the Docker-container exits without throwing an error.

Use *@mock_batch_simple* instead if you do not want to use a Docker-container. With this decorator, jobs are simply marked as 'Success' without trying to execute any commands/scripts.

Implemented features for this service

- [X] cancel_job
- [X] create_compute_environment
- [X] create_job_queue
- [X] create_scheduling_policy
- [X] delete_compute_environment
- [X] delete_job_queue
- [X] delete_scheduling_policy
- [X] deregister_job_definition
- [X] describe_compute_environments

  Pagination is not yet implemented
- [X] describe_job_definitions

  Pagination is not yet implemented
- [X] describe_job_queues

  Pagination is not yet implemented
- [X] describe_jobs
- [X] describe_scheduling_policies
- [X] list_jobs

  Pagination is not yet implemented
- [X] list_scheduling_policies

  Pagination is not yet implemented
- [X] list_tags_for_resource
- [X] register_job_definition

- [X] submit_job

  Parameters RetryStrategy and Parameters are not yet implemented.

- [X] tag_resource
- [X] terminate_job
- [X] untag_resource
- [X] update_compute_environment
- [X] update_job_queue
- [X] update_scheduling_policy

### 2.10.14 budgets

**class** moto.budgets.models.**BudgetsBackend**(*region_name: str*, *account_id: str*)

Implementation of Budgets APIs.

Implemented features for this service

- [X] create_budget
- [ ] create_budget_action
- [X] create_notification
- [ ] create_subscriber
- [X] delete_budget
- [ ] delete_budget_action
- [X] delete_notification
- [ ] delete_subscriber
- [X] describe_budget
- [ ] describe_budget_action
- [ ] describe_budget_action_histories
- [ ] describe_budget_actions_for_account
- [ ] describe_budget_actions_for_budget
- [ ] describe_budget_notifications_for_account
- [ ] describe_budget_performance_history
- [X] describe_budgets

  Pagination is not yet implemented

- [X] describe_notifications_for_budget

  Pagination has not yet been implemented

- [ ] describe_subscribers_for_notification
- [ ] execute_budget_action
- [ ] update_budget
- [ ] update_budget_action

- [ ] update_notification
- [ ] update_subscriber

### 2.10.15 ce

**class** moto.ce.models.**CostExplorerBackend**(*region_name: str*, *account_id: str*)

Implementation of CostExplorer APIs.

Implemented features for this service

- [ ] create_anomaly_monitor
- [ ] create_anomaly_subscription
- [X] create_cost_category_definition

  The EffectiveOn and ResourceTags-parameters are not yet implemented
- [ ] delete_anomaly_monitor
- [ ] delete_anomaly_subscription
- [X] delete_cost_category_definition

  The EffectiveOn-parameter is not yet implemented
- [X] describe_cost_category_definition

  The EffectiveOn-parameter is not yet implemented
- [ ] get_anomalies
- [ ] get_anomaly_monitors
- [ ] get_anomaly_subscriptions
- [ ] get_approximate_usage_records
- [X] get_cost_and_usage

  There is no validation yet on any of the input parameters.

  Cost or usage is not tracked by Moto, so this call will return nothing by default.

  You can use a dedicated API to override this, by configuring a queue of expected results.

  A request to *get_cost_and_usage* will take the first result from that queue, and assign it to the provided parameters. Subsequent requests using the same parameters will return the same result. Other requests using different parameters will take the next result from the queue, or return an empty result if the queue is empty.

  Configure this queue by making an HTTP request to */moto-api/static/ce/cost-and-usage-results*. An example invocation looks like this:

```
result = {
    "results": [
        {
            "ResultsByTime": [
                {
                    "TimePeriod": {"Start": "2024-01-01", "End": "2024-01-02
↪"},
                    "Total": {
```

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```
                        "BlendedCost": {"Amount": "0.0101516483", "Unit":
↪"USD"}
                    },
                    "Groups": [],
                    "Estimated": False
                }
            ],
            "DimensionValueAttributes": [{"Value": "v", "Attributes": {"a":
↪"b"}}]
        },
        {
            ...
        },
    ]
}
resp = requests.post(
    "http://motoapi.amazonaws.com/moto-api/static/ce/cost-and-usage-results
↪",
    json=expected_results,
)
assert resp.status_code == 201

ce = boto3.client("ce", region_name="us-east-1")
resp = ce.get_cost_and_usage(...)
```

- [ ] get_cost_and_usage_with_resources
- [ ] get_cost_categories
- [ ] get_cost_forecast
- [ ] get_dimension_values
- [ ] get_reservation_coverage
- [ ] get_reservation_purchase_recommendation
- [ ] get_reservation_utilization
- [ ] get_rightsizing_recommendation
- [ ] get_savings_plan_purchase_recommendation_details
- [ ] get_savings_plans_coverage
- [ ] get_savings_plans_purchase_recommendation
- [ ] get_savings_plans_utilization
- [ ] get_savings_plans_utilization_details
- [ ] get_tags
- [ ] get_usage_forecast
- [ ] list_cost_allocation_tags
- [ ] list_cost_category_definitions
- [ ] list_savings_plans_purchase_recommendation_generation
- [X] list_tags_for_resource

- [ ] provide_anomaly_feedback
- [ ] start_savings_plans_purchase_recommendation_generation
- [X] tag_resource
- [X] untag_resource
- [ ] update_anomaly_monitor
- [ ] update_anomaly_subscription
- [ ] update_cost_allocation_tags_status
- [X] update_cost_category_definition

  The EffectiveOn-parameter is not yet implemented

### 2.10.16 Supported CloudFormation resources

A list of all resources that can be created via CloudFormation. Please let us know if you'd like support for a resource not yet listed here.

| | Create | Update | Delete | Fn::GetAtt |
|---|---|---|---|---|
| AWS::ApiGateway::D | x | | | • [ ] DeploymentId |
| AWS::ApiGateway::M | x | | | |
| AWS::ApiGateway::R | x | | | • [ ] ResourceId |
| AWS::AutoScaling::A | x | x | x | |
| AWS::AutoScaling::L | x | x | x | |
| AWS::AutoScaling::S | x | | | • [ ] ScheduledActionName |
| AWS::AutoScaling::W | | | | |
| AWS::Batch::Comput | x | | | • [ ] ComputeEnvironmentArn |
| AWS::Batch::JobDefi | x | | | |
| AWS::Batch::JobQue | x | | | • [ ] JobQueueArn |
| AWS::CloudFormatio | x | x | x | |
| AWS::DataPipeline::P | x | | | |
| AWS::DynamoDB::Ta | x | | x | • [x] Arn<br>• [x] StreamArn |

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Table 1 – continued from previous page

| | Create | Update | Delete | Fn::GetAtt |
|---|---|---|---|---|
| AWS::EC2::Instance | x | | x | • [x] AvailabilityZone<br>• [x] PrivateDnsName<br>• [x] PrivateIp<br>• [x] PublicDnsName<br>• [x] PublicIp |
| AWS::EC2::InternetG | x | | | • [ ] InternetGatewayId |
| AWS::EC2::LaunchTe | x | x | x | • [x] LatestVersionNumber<br>• [x] LaunchTemplateId<br>• [x] DefaultVersionNumber |
| AWS::EC2::NatGatew | x | | | • [ ] NatGatewayId |
| AWS::EC2::NetworkI | x | | | • [ ] PrimaryIpv6Address<br>• [x] SecondaryPrivateIpAddresses<br>• [x] PrimaryPrivateIpAddress<br>• [ ] Id |
| AWS::EC2::Route | x | | | • [ ] CidrBlock |
| AWS::EC2::RouteTab | x | | | • [ ] RouteTableId |
| AWS::EC2::SecurityC | x | x | x | • [x] GroupId<br>• [ ] VpcId |
| AWS::EC2::SecurityC | x | | | • [ ] Id |
| AWS::EC2::Subnet | x | | x | • [ ] VpcId<br>• [ ] NetworkAclAssociationId<br>• [ ] AvailabilityZoneId<br>• [ ] OutpostArn<br>• [x] AvailabilityZone<br>• [ ] CidrBlock |

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Table 1 – continued from previous page

| | Create | Update | Delete | Fn::GetAtt |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| AWS::EC2::SubnetRo | x | | | • [ ] Id |
| AWS::EC2::TransitGa | x | | | • [ ] TransitGatewayArn |
| AWS::EC2::VPC | x | | x | • [ ] Id<br>• [ ] VpcId<br>• [ ] CidrBlockAssociations<br>• [ ] CidrBlock<br>• [ ] DefaultNetworkAcl<br>• [ ] Ipv6CidrBlocks<br>• [ ] DefaultSecurityGroup |
| AWS::EC2::VPCGate | x | | | • [ ] AttachmentType |
| AWS::EC2::VPCPeer | x | | | • [ ] Id |
| AWS::EC2::Volume | x | | | • [ ] VolumeId |
| AWS::EC2::VolumeA | x | | | |
| AWS::ECR::Repositor | x | x | | • [x] RepositoryUri<br>• [x] Arn |
| AWS::ECS::Cluster | x | x | | • [x] Arn |
| AWS::ECS::Service | x | x | | • [ ] ServiceArn<br>• [x] Name |
| AWS::ECS::TaskDefi | x | x | | • [ ] TaskDefinitionArn |
| AWS::EFS::AccessPo | x | | | • [ ] AccessPointId<br>• [ ] Arn |

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Table 1 – continued from previous page

| | Create | Update | Delete | Fn::GetAtt |
|---|---|---|---|---|
| AWS::EFS::FileSyster | x | | x | • [ ] FileSystemId<br>• [ ] Arn |
| AWS::EFS::MountTar | x | x | x | • [ ] IpAddress<br>• [ ] Id |
| AWS::EMR::Cluster | x | | x | • [ ] MasterPublicDNS |
| AWS::EMR::Security | x | | x | |
| AWS::Events::Archive | x | x | | • [x] Arn |
| AWS::Events::EventB | x | x | x | • [x] Arn<br>• [x] Name |
| AWS::Events::Rule | x | x | x | • [x] Arn |
| AWS::IAM::AccessK | x | x | x | • [x] SecretAccessKey |
| AWS::IAM::InstanceF | x | | x | • [x] Arn |
| AWS::IAM::Managed | x | | | • [ ] IsAttachable<br>• [ ] UpdateDate<br>• [ ] PermissionsBoundaryUsageCount<br>• [ ] AttachmentCount<br>• [ ] PolicyArn<br>• [ ] DefaultVersionId<br>• [ ] CreateDate<br>• [ ] PolicyId |
| AWS::IAM::Policy | | | | • [ ] Id |
| AWS::IAM::Role | x | | x | • [x] Arn<br>• [x] RoleId |
| AWS::IAM::User | x | x | x | • [x] Arn |
| AWS::KMS::Key | x | | | • [ ] KeyId<br>• [x] Arn |

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Table 1 – continued from previous page

| | Create | Update | Delete | Fn::GetAtt |
|---|---|---|---|---|
| | | | | |
| AWS::Kinesis::Stream | x | x | x | • [x] Arn |
| AWS::Logs::LogGrou | x | | | • [x] Arn |
| AWS::RDS::DBCluste | | | | |
| AWS::RDS::DBParam | x | | | • [ ] DBParameterGroupName |
| AWS::Redshift::Cluste | x | | | • [ ] MasterPasswordSecretArn<br>• [x] Endpoint.Address<br>• [x] Endpoint.Port<br>• [ ] ClusterNamespaceArn<br>• [ ] DeferMaintenanceIdentifier |
| AWS::Route53::Healt | x | | | • [ ] HealthCheckId |
| AWS::Route53::Recor | x | x | x | |
| AWS::Route53::Recor | x | | | |
| AWS::S3::Bucket | x | x | x | • [x] RegionalDomainName<br>• [x] DomainName<br>• [x] WebsiteURL<br>• [x] DualStackDomainName<br>• [x] Arn |
| AWS::SNS::Topic | x | x | | • [ ] TopicArn<br>• [x] TopicName |
| AWS::SQS::Queue | x | x | x | • [x] Arn<br>• [x] QueueName<br>• [ ] QueueUrl |
| AWS::SSM::Paramete | x | x | x | • [ ] Type<br>• [ ] Value |

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Table 1 – continued from previous page

| | Create | Update | Delete | Fn::GetAtt |
|---|---|---|---|---|
| AWS::SageMaker::En | x | x | x | • [x] EndpointName |
| AWS::SageMaker::En | x | x | x | • [x] EndpointConfigName |
| AWS::SageMaker::M | x | x | x | • [x] ModelName |
| AWS::StepFunctions:: | x | x | x | • [ ] StateMachineRevisionId<br>• [ ] Arn<br>• [x] Name |

### 2.10.17 cloudformation

**class** moto.cloudformation.models.**CloudFormationBackend**(*region_name: str*, *account_id: str*)

CustomResources are supported when running Moto in ServerMode. Because creating these resources involves running a Lambda-function that informs the MotoServer about the status of the resources, the MotoServer has to be reachable for outside connections. This means it has to run inside a Docker-container, or be started using *moto_server -h 0.0.0.0*.

Implemented features for this service

- [ ] activate_organizations_access
- [ ] activate_type
- [ ] batch_describe_type_configurations
- [ ] cancel_update_stack
- [ ] continue_update_rollback
- [X] create_change_set
- [ ] create_generated_template
- [X] create_stack

  The functionality behind EnableTerminationProtection is not yet implemented.

- [X] create_stack_instances

  The following parameters are not yet implemented: DeploymentTargets.AccountFilterType, DeploymentTargets.AccountsUrl, OperationPreferences, CallAs

- [X] create_stack_set

  The following parameters are not yet implemented: StackId, AdministrationRoleARN, AutoDeployment, ExecutionRoleName, CallAs, ClientRequestToken, ManagedExecution

- [ ] deactivate_organizations_access
- [ ] deactivate_type
- [X] delete_change_set
- [ ] delete_generated_template
- [X] delete_stack
- [X] delete_stack_instances

  The following parameters are not yet implemented: DeploymentTargets, OperationPreferences, RetainStacks, OperationId, CallAs
- [X] delete_stack_set
- [ ] deregister_type
- [ ] describe_account_limits
- [X] describe_change_set
- [ ] describe_change_set_hooks
- [ ] describe_generated_template
- [ ] describe_organizations_access
- [ ] describe_publisher
- [ ] describe_resource_scan
- [ ] describe_stack_drift_detection_status
- [X] describe_stack_events
- [X] describe_stack_instance
- [X] describe_stack_resource
- [ ] describe_stack_resource_drifts
- [X] describe_stack_resources
- [X] describe_stack_set
- [X] describe_stack_set_operation
- [X] describe_stacks
- [ ] describe_type
- [ ] describe_type_registration
- [ ] detect_stack_drift
- [ ] detect_stack_resource_drift
- [ ] detect_stack_set_drift
- [ ] estimate_template_cost
- [X] execute_change_set
- [ ] get_generated_template
- [X] get_stack_policy
- [X] get_template

- [ ] get_template_summary
- [ ] import_stacks_to_stack_set
- [X] list_change_sets
- [X] list_exports
- [ ] list_generated_templates
- [ ] list_imports
- [ ] list_resource_scan_related_resources
- [ ] list_resource_scan_resources
- [ ] list_resource_scans
- [ ] list_stack_instance_resource_drifts
- [X] list_stack_instances

  Pagination is not yet implemented. The parameters StackInstanceAccount/StackInstanceRegion are not yet implemented.
- [X] list_stack_resources
- [X] list_stack_set_operation_results
- [X] list_stack_set_operations
- [X] list_stack_sets
- [X] list_stacks
- [ ] list_type_registrations
- [ ] list_type_versions
- [ ] list_types
- [ ] publish_type
- [ ] record_handler_progress
- [ ] register_publisher
- [ ] register_type
- [ ] rollback_stack
- [X] set_stack_policy

  Note that Moto does no validation/parsing/enforcement of this policy - we simply persist it.
- [ ] set_type_configuration
- [ ] set_type_default_version
- [ ] signal_resource
- [ ] start_resource_scan
- [X] stop_stack_set_operation
- [ ] test_type
- [ ] update_generated_template
- [X] update_stack

- [X] update_stack_instances

  Calling this will update the parameters, but the actual resources are not updated

- [X] update_stack_set
- [ ] update_termination_protection
- [X] validate_template

### 2.10.18 cloudfront

Implemented features for this service

- [ ] associate_alias
- [ ] copy_distribution
- [ ] create_cache_policy
- [ ] create_cloud_front_origin_access_identity
- [ ] create_continuous_deployment_policy
- [X] create_distribution

  Not all configuration options are supported yet. Please raise an issue if we're not persisting/returning the correct attributes for your use-case.

- [X] create_distribution_with_tags
- [ ] create_field_level_encryption_config
- [ ] create_field_level_encryption_profile
- [ ] create_function
- [X] create_invalidation
- [ ] create_key_group
- [ ] create_key_value_store
- [ ] create_monitoring_subscription
- [X] create_origin_access_control
- [ ] create_origin_request_policy
- [ ] create_public_key
- [ ] create_realtime_log_config
- [ ] create_response_headers_policy
- [ ] create_streaming_distribution
- [ ] create_streaming_distribution_with_tags
- [ ] delete_cache_policy
- [ ] delete_cloud_front_origin_access_identity
- [ ] delete_continuous_deployment_policy
- [X] delete_distribution

  The IfMatch-value is ignored - any value is considered valid. Calling this function without a value is invalid, per AWS' behaviour

- [ ] delete_field_level_encryption_config
- [ ] delete_field_level_encryption_profile
- [ ] delete_function
- [ ] delete_key_group
- [ ] delete_key_value_store
- [ ] delete_monitoring_subscription
- [X] delete_origin_access_control

  The IfMatch-parameter is not yet implemented
- [ ] delete_origin_request_policy
- [ ] delete_public_key
- [ ] delete_realtime_log_config
- [ ] delete_response_headers_policy
- [ ] delete_streaming_distribution
- [ ] describe_function
- [ ] describe_key_value_store
- [ ] get_cache_policy
- [ ] get_cache_policy_config
- [ ] get_cloud_front_origin_access_identity
- [ ] get_cloud_front_origin_access_identity_config
- [ ] get_continuous_deployment_policy
- [ ] get_continuous_deployment_policy_config
- [X] get_distribution
- [X] get_distribution_config
- [ ] get_field_level_encryption
- [ ] get_field_level_encryption_config
- [ ] get_field_level_encryption_profile
- [ ] get_field_level_encryption_profile_config
- [ ] get_function
- [ ] get_invalidation
- [ ] get_key_group
- [ ] get_key_group_config
- [ ] get_monitoring_subscription
- [X] get_origin_access_control
- [ ] get_origin_access_control_config
- [ ] get_origin_request_policy
- [ ] get_origin_request_policy_config

- [ ] get_public_key
- [ ] get_public_key_config
- [ ] get_realtime_log_config
- [ ] get_response_headers_policy
- [ ] get_response_headers_policy_config
- [ ] get_streaming_distribution
- [ ] get_streaming_distribution_config
- [ ] list_cache_policies
- [ ] list_cloud_front_origin_access_identities
- [ ] list_conflicting_aliases
- [ ] list_continuous_deployment_policies
- [X] list_distributions

  Pagination is not supported yet.
- [ ] list_distributions_by_cache_policy_id
- [ ] list_distributions_by_key_group
- [ ] list_distributions_by_origin_request_policy_id
- [ ] list_distributions_by_realtime_log_config
- [ ] list_distributions_by_response_headers_policy_id
- [ ] list_distributions_by_web_acl_id
- [ ] list_field_level_encryption_configs
- [ ] list_field_level_encryption_profiles
- [ ] list_functions
- [X] list_invalidations

  Pagination is not yet implemented
- [ ] list_key_groups
- [ ] list_key_value_stores
- [X] list_origin_access_controls

  Pagination is not yet implemented
- [ ] list_origin_request_policies
- [ ] list_public_keys
- [ ] list_realtime_log_configs
- [ ] list_response_headers_policies
- [ ] list_streaming_distributions
- [X] list_tags_for_resource
- [ ] publish_function
- [ ] tag_resource

- [ ] test_function
- [ ] untag_resource
- [ ] update_cache_policy
- [ ] update_cloud_front_origin_access_identity
- [ ] update_continuous_deployment_policy
- [X] update_distribution

  The IfMatch-value is ignored - any value is considered valid. Calling this function without a value is invalid, per AWS' behaviour
- [ ] update_distribution_with_staging_config
- [ ] update_field_level_encryption_config
- [ ] update_field_level_encryption_profile
- [ ] update_function
- [ ] update_key_group
- [ ] update_key_value_store
- [X] update_origin_access_control

  The IfMatch-parameter is not yet implemented
- [ ] update_origin_request_policy
- [ ] update_public_key
- [ ] update_realtime_log_config
- [ ] update_response_headers_policy
- [ ] update_streaming_distribution

### 2.10.19 cloudtrail

**class** moto.cloudtrail.models.**CloudTrailBackend**(*region_name: str*, *account_id: str*)

Implementation of CloudTrail APIs.

Implemented features for this service

- [X] add_tags
- [ ] cancel_query
- [ ] create_channel
- [ ] create_event_data_store
- [X] create_trail
- [ ] delete_channel
- [ ] delete_event_data_store
- [ ] delete_resource_policy
- [X] delete_trail
- [ ] deregister_organization_delegated_admin

- [ ] describe_query
- [X] describe_trails
- [ ] disable_federation
- [ ] enable_federation
- [ ] get_channel
- [ ] get_event_data_store
- [X] get_event_selectors
- [ ] get_import
- [X] get_insight_selectors
- [ ] get_query_results
- [ ] get_resource_policy
- [X] get_trail
- [X] get_trail_status
- [ ] list_channels
- [ ] list_event_data_stores
- [ ] list_import_failures
- [ ] list_imports
- [ ] list_insights_metric_data
- [ ] list_public_keys
- [ ] list_queries
- [X] list_tags

  Pagination is not yet implemented
- [X] list_trails
- [ ] lookup_events
- [X] put_event_selectors
- [X] put_insight_selectors
- [ ] put_resource_policy
- [ ] register_organization_delegated_admin
- [X] remove_tags
- [ ] restore_event_data_store
- [ ] start_event_data_store_ingestion
- [ ] start_import
- [X] start_logging
- [ ] start_query
- [ ] stop_event_data_store_ingestion
- [ ] stop_import

- [X] stop_logging
- [ ] update_channel
- [ ] update_event_data_store
- [X] update_trail

### 2.10.20 cloudwatch

Implemented features for this service

- [X] delete_alarms
- [ ] delete_anomaly_detector
- [X] delete_dashboards
- [ ] delete_insight_rules
- [ ] delete_metric_stream
- [ ] describe_alarm_history
- [X] describe_alarms
- [ ] describe_alarms_for_metric
- [ ] describe_anomaly_detectors
- [ ] describe_insight_rules
- [ ] disable_alarm_actions
- [ ] disable_insight_rules
- [ ] enable_alarm_actions
- [ ] enable_insight_rules
- [X] get_dashboard
- [ ] get_insight_rule_report
- [X] get_metric_data
- [X] get_metric_statistics
- [ ] get_metric_stream
- [ ] get_metric_widget_image
- [X] list_dashboards
- [ ] list_managed_insight_rules
- [ ] list_metric_streams
- [X] list_metrics
- [X] list_tags_for_resource
- [ ] put_anomaly_detector
- [ ] put_composite_alarm
- [X] put_dashboard
- [ ] put_insight_rule

- [ ] put_managed_insight_rules
- [X] put_metric_alarm
- [X] put_metric_data
- [ ] put_metric_stream
- [X] set_alarm_state
- [ ] start_metric_streams
- [ ] stop_metric_streams
- [X] tag_resource
- [X] untag_resource

### 2.10.21 codebuild

Implemented features for this service

- [ ] batch_delete_builds
- [ ] batch_get_build_batches
- [X] batch_get_builds
- [ ] batch_get_fleets
- [ ] batch_get_projects
- [ ] batch_get_report_groups
- [ ] batch_get_reports
- [ ] create_fleet
- [X] create_project
- [ ] create_report_group
- [ ] create_webhook
- [ ] delete_build_batch
- [ ] delete_fleet
- [X] delete_project
- [ ] delete_report
- [ ] delete_report_group
- [ ] delete_resource_policy
- [ ] delete_source_credentials
- [ ] delete_webhook
- [ ] describe_code_coverages
- [ ] describe_test_cases
- [ ] get_report_group_trend
- [ ] get_resource_policy
- [ ] import_source_credentials

- [ ] invalidate_project_cache
- [ ] list_build_batches
- [ ] list_build_batches_for_project
- [X] list_builds
- [X] list_builds_for_project
- [ ] list_curated_environment_images
- [ ] list_fleets
- [X] list_projects
- [ ] list_report_groups
- [ ] list_reports
- [ ] list_reports_for_report_group
- [ ] list_shared_projects
- [ ] list_shared_report_groups
- [ ] list_source_credentials
- [ ] put_resource_policy
- [ ] retry_build
- [ ] retry_build_batch
- [X] start_build
- [ ] start_build_batch
- [X] stop_build
- [ ] stop_build_batch
- [ ] update_fleet
- [ ] update_project
- [ ] update_project_visibility
- [ ] update_report_group
- [ ] update_webhook

### 2.10.22 codecommit

Implemented features for this service

- [ ] associate_approval_rule_template_with_repository
- [ ] batch_associate_approval_rule_template_with_repositories
- [ ] batch_describe_merge_conflicts
- [ ] batch_disassociate_approval_rule_template_from_repositories
- [ ] batch_get_commits
- [ ] batch_get_repositories
- [ ] create_approval_rule_template

- [ ] create_branch
- [ ] create_commit
- [ ] create_pull_request
- [ ] create_pull_request_approval_rule
- [X] create_repository
- [ ] create_unreferenced_merge_commit
- [ ] delete_approval_rule_template
- [ ] delete_branch
- [ ] delete_comment_content
- [ ] delete_file
- [ ] delete_pull_request_approval_rule
- [X] delete_repository
- [ ] describe_merge_conflicts
- [ ] describe_pull_request_events
- [ ] disassociate_approval_rule_template_from_repository
- [ ] evaluate_pull_request_approval_rules
- [ ] get_approval_rule_template
- [ ] get_blob
- [ ] get_branch
- [ ] get_comment
- [ ] get_comment_reactions
- [ ] get_comments_for_compared_commit
- [ ] get_comments_for_pull_request
- [ ] get_commit
- [ ] get_differences
- [ ] get_file
- [ ] get_folder
- [ ] get_merge_commit
- [ ] get_merge_conflicts
- [ ] get_merge_options
- [ ] get_pull_request
- [ ] get_pull_request_approval_states
- [ ] get_pull_request_override_state
- [X] get_repository
- [ ] get_repository_triggers
- [ ] list_approval_rule_templates

- [ ] list_associated_approval_rule_templates_for_repository
- [ ] list_branches
- [ ] list_file_commit_history
- [ ] list_pull_requests
- [ ] list_repositories
- [ ] list_repositories_for_approval_rule_template
- [ ] list_tags_for_resource
- [ ] merge_branches_by_fast_forward
- [ ] merge_branches_by_squash
- [ ] merge_branches_by_three_way
- [ ] merge_pull_request_by_fast_forward
- [ ] merge_pull_request_by_squash
- [ ] merge_pull_request_by_three_way
- [ ] override_pull_request_approval_rules
- [ ] post_comment_for_compared_commit
- [ ] post_comment_for_pull_request
- [ ] post_comment_reply
- [ ] put_comment_reaction
- [ ] put_file
- [ ] put_repository_triggers
- [ ] tag_resource
- [ ] test_repository_triggers
- [ ] untag_resource
- [ ] update_approval_rule_template_content
- [ ] update_approval_rule_template_description
- [ ] update_approval_rule_template_name
- [ ] update_comment
- [ ] update_default_branch
- [ ] update_pull_request_approval_rule_content
- [ ] update_pull_request_approval_state
- [ ] update_pull_request_description
- [ ] update_pull_request_status
- [ ] update_pull_request_title
- [ ] update_repository_description
- [ ] update_repository_encryption_key
- [ ] update_repository_name

### 2.10.23 codepipeline

Implemented features for this service

- [ ] acknowledge_job
- [ ] acknowledge_third_party_job
- [ ] create_custom_action_type
- [X] create_pipeline
- [ ] delete_custom_action_type
- [X] delete_pipeline
- [ ] delete_webhook
- [ ] deregister_webhook_with_third_party
- [ ] disable_stage_transition
- [ ] enable_stage_transition
- [ ] get_action_type
- [ ] get_job_details
- [X] get_pipeline
- [ ] get_pipeline_execution
- [ ] get_pipeline_state
- [ ] get_third_party_job_details
- [ ] list_action_executions
- [ ] list_action_types
- [ ] list_pipeline_executions
- [X] list_pipelines
- [X] list_tags_for_resource
- [ ] list_webhooks
- [ ] poll_for_jobs
- [ ] poll_for_third_party_jobs
- [ ] put_action_revision
- [ ] put_approval_result
- [ ] put_job_failure_result
- [ ] put_job_success_result
- [ ] put_third_party_job_failure_result
- [ ] put_third_party_job_success_result
- [ ] put_webhook
- [ ] register_webhook_with_third_party
- [ ] retry_stage_execution
- [ ] start_pipeline_execution

- [ ] stop_pipeline_execution
- [X] tag_resource
- [X] untag_resource
- [ ] update_action_type
- [X] update_pipeline

### 2.10.24 cognito-identity

Implemented features for this service

- [X] create_identity_pool
- [ ] delete_identities
- [ ] delete_identity_pool
- [ ] describe_identity
- [X] describe_identity_pool
- [X] get_credentials_for_identity
- [X] get_id
- [ ] get_identity_pool_roles
- [X] get_open_id_token
- [X] get_open_id_token_for_developer_identity
- [ ] get_principal_tag_attribute_map
- [X] list_identities

  The MaxResults-parameter has not yet been implemented
- [X] list_identity_pools

  The MaxResults-parameter has not yet been implemented
- [ ] list_tags_for_resource
- [ ] lookup_developer_identity
- [ ] merge_developer_identities
- [ ] set_identity_pool_roles
- [ ] set_principal_tag_attribute_map
- [ ] tag_resource
- [ ] unlink_developer_identity
- [ ] unlink_identity
- [ ] untag_resource
- [X] update_identity_pool

  The AllowClassic-parameter has not yet been implemented

### 2.10.25 cognito-idp

class moto.cognitoidp.models.**CognitoIdpBackend**(*region_name: str*, *account_id: str*)

Moto mocks the JWK uris. If you're using decorators, you can retrieve this information by making a call to *https://cognito-idp.us-west-2.amazonaws.com/someuserpoolid/.well-known/jwks.json*.

Call *http://localhost:5000/userpoolid/.well-known/jwks.json* instead of you're running Moto in Server-Mode or Docker. Because Moto cannot determine this is a CognitoIDP-request based on the URL alone, you have to add an Authorization-header instead: *Authorization: AWS4-HMAC-SHA256 Credential=mock_access_key/20220524/us-east-1/cognito-idp/aws4_request, SignedHeaders=content-length;content-type;host;x-amz-date, Signature=asdf*

In some cases, you need to have reproducible IDs for the user pool. For example, a single initialization before the start of integration tests.

This behavior can be enabled by passing the environment variable: MOTO_COGNITO_IDP_USER_POOL_ID_STRATEGY=HASH.

Implemented features for this service

- [X] add_custom_attributes
- [X] admin_add_user_to_group
- [X] admin_confirm_sign_up
- [X] admin_create_user
- [X] admin_delete_user
- [X] admin_delete_user_attributes
- [ ] admin_disable_provider_for_user
- [X] admin_disable_user
- [X] admin_enable_user
- [ ] admin_forget_device
- [ ] admin_get_device
- [X] admin_get_user
- [X] admin_initiate_auth
- [ ] admin_link_provider_for_user
- [ ] admin_list_devices
- [X] admin_list_groups_for_user
- [ ] admin_list_user_auth_events
- [X] admin_remove_user_from_group
- [X] admin_reset_user_password
- [X] admin_respond_to_auth_challenge
- [X] admin_set_user_mfa_preference
- [X] admin_set_user_password
- [ ] admin_set_user_settings
- [ ] admin_update_auth_event_feedback

- [ ] admin_update_device_status
- [X] admin_update_user_attributes
- [X] admin_user_global_sign_out
- [X] associate_software_token
- [X] change_password
- [ ] confirm_device
- [X] confirm_forgot_password
- [X] confirm_sign_up
- [X] create_group
- [X] create_identity_provider
- [X] create_resource_server
- [ ] create_user_import_job
- [X] create_user_pool
- [X] create_user_pool_client
- [X] create_user_pool_domain
- [X] delete_group
- [X] delete_identity_provider
- [ ] delete_resource_server
- [ ] delete_user
- [ ] delete_user_attributes
- [X] delete_user_pool
- [X] delete_user_pool_client
- [X] delete_user_pool_domain
- [X] describe_identity_provider
- [X] describe_resource_server
- [ ] describe_risk_configuration
- [ ] describe_user_import_job
- [X] describe_user_pool
- [X] describe_user_pool_client
- [X] describe_user_pool_domain
- [ ] forget_device
- [X] forgot_password

    The ForgotPassword operation is partially broken in AWS. If the input is 100% correct it works fine.

    Otherwise you get semi-random garbage and HTTP 200 OK, for example: - recovery for username which is not registered in any cognito pool - recovery for username belonging to a different user pool than the client id is registered to - phone-based recovery for a user without phone_number / phone_number_verified attributes - same as above, but email / email_verified

- [ ] get_csv_header
- [ ] get_device
- [X] get_group
- [ ] get_identity_provider_by_identifier
- [ ] get_log_delivery_configuration
- [ ] get_signing_certificate
- [ ] get_ui_customization
- [X] get_user
- [ ] get_user_attribute_verification_code
- [X] get_user_pool_mfa_config
- [X] global_sign_out
- [X] initiate_auth
- [ ] list_devices
- [X] list_groups
- [X] list_identity_providers
- [X] list_resource_servers
- [ ] list_tags_for_resource
- [ ] list_user_import_jobs
- [X] list_user_pool_clients
- [X] list_user_pools
- [X] list_users
- [X] list_users_in_group
- [ ] resend_confirmation_code
- [X] respond_to_auth_challenge
- [ ] revoke_token
- [ ] set_log_delivery_configuration
- [ ] set_risk_configuration
- [ ] set_ui_customization
- [X] set_user_mfa_preference
- [X] set_user_pool_mfa_config
- [ ] set_user_settings
- [X] sign_up
- [ ] start_user_import_job
- [ ] stop_user_import_job
- [ ] tag_resource
- [ ] untag_resource

- [ ] update_auth_event_feedback
- [ ] update_device_status
- [X] update_group
- [X] update_identity_provider
- [ ] update_resource_server
- [X] update_user_attributes

  The parameter ClientMetadata has not yet been implemented. No CodeDeliveryDetails are returned.
- [X] update_user_pool
- [X] update_user_pool_client
- [X] update_user_pool_domain
- [X] verify_software_token

  The parameter UserCode has not yet been implemented
- [ ] verify_user_attribute

### 2.10.26 comprehend

**class** moto.comprehend.models.**ComprehendBackend**(*region_name: str*, *account_id: str*)

Implementation of Comprehend APIs.

Implemented features for this service

- [ ] batch_detect_dominant_language
- [ ] batch_detect_entities
- [ ] batch_detect_key_phrases
- [ ] batch_detect_sentiment
- [ ] batch_detect_syntax
- [ ] batch_detect_targeted_sentiment
- [ ] classify_document
- [ ] contains_pii_entities
- [ ] create_dataset
- [ ] create_document_classifier
- [ ] create_endpoint
- [X] create_entity_recognizer

  The ClientRequestToken-parameter is not yet implemented
- [ ] create_flywheel
- [ ] delete_document_classifier
- [ ] delete_endpoint
- [X] delete_entity_recognizer
- [ ] delete_flywheel

- [ ] delete_resource_policy
- [ ] describe_dataset
- [ ] describe_document_classification_job
- [ ] describe_document_classifier
- [ ] describe_dominant_language_detection_job
- [ ] describe_endpoint
- [ ] describe_entities_detection_job
- [X] describe_entity_recognizer
- [ ] describe_events_detection_job
- [ ] describe_flywheel
- [ ] describe_flywheel_iteration
- [ ] describe_key_phrases_detection_job
- [ ] describe_pii_entities_detection_job
- [ ] describe_resource_policy
- [ ] describe_sentiment_detection_job
- [ ] describe_targeted_sentiment_detection_job
- [ ] describe_topics_detection_job
- [ ] detect_dominant_language
- [ ] detect_entities
- [X] detect_key_phrases
- [X] detect_pii_entities
- [X] detect_sentiment
- [ ] detect_syntax
- [ ] detect_targeted_sentiment
- [ ] detect_toxic_content
- [ ] import_model
- [ ] list_datasets
- [ ] list_document_classification_jobs
- [ ] list_document_classifier_summaries
- [ ] list_document_classifiers
- [ ] list_dominant_language_detection_jobs
- [ ] list_endpoints
- [ ] list_entities_detection_jobs
- [ ] list_entity_recognizer_summaries
- [X] list_entity_recognizers

Pagination is not yet implemented. The following filters are not yet implemented: Status, SubmitTimeBefore, SubmitTimeAfter

- [ ] list_events_detection_jobs
- [ ] list_flywheel_iteration_history
- [ ] list_flywheels
- [ ] list_key_phrases_detection_jobs
- [ ] list_pii_entities_detection_jobs
- [ ] list_sentiment_detection_jobs
- [X] list_tags_for_resource
- [ ] list_targeted_sentiment_detection_jobs
- [ ] list_topics_detection_jobs
- [ ] put_resource_policy
- [ ] start_document_classification_job
- [ ] start_dominant_language_detection_job
- [ ] start_entities_detection_job
- [ ] start_events_detection_job
- [ ] start_flywheel_iteration
- [ ] start_key_phrases_detection_job
- [ ] start_pii_entities_detection_job
- [ ] start_sentiment_detection_job
- [ ] start_targeted_sentiment_detection_job
- [ ] start_topics_detection_job
- [ ] stop_dominant_language_detection_job
- [ ] stop_entities_detection_job
- [ ] stop_events_detection_job
- [ ] stop_key_phrases_detection_job
- [ ] stop_pii_entities_detection_job
- [ ] stop_sentiment_detection_job
- [ ] stop_targeted_sentiment_detection_job
- [ ] stop_training_document_classifier
- [X] stop_training_entity_recognizer
- [X] tag_resource
- [X] untag_resource
- [ ] update_endpoint
- [ ] update_flywheel

### 2.10.27 config

Implemented features for this service

- [X] batch_get_aggregate_resource_config Returns configuration of resource for current regional backend.

  Item is returned in AWS Config format.

  As far a moto goes – the only real difference between this function and the *batch_get_resource_config* function is that this will require a Config Aggregator be set up a priori and can search based on resource regions.

  Note: moto will IGNORE the resource account ID in the search query.

- [X] batch_get_resource_config Returns configuration of resource for the current regional backend.

  Item is returned in AWS Config format.

  **param resource_keys**
  **param backend_region**

- [X] delete_aggregation_authorization
- [X] delete_config_rule Delete config rule used for evaluating resource compliance.
- [X] delete_configuration_aggregator
- [X] delete_configuration_recorder
- [ ] delete_conformance_pack
- [X] delete_delivery_channel
- [ ] delete_evaluation_results
- [ ] delete_organization_config_rule
- [X] delete_organization_conformance_pack
- [ ] delete_pending_aggregation_request
- [ ] delete_remediation_configuration
- [ ] delete_remediation_exceptions
- [ ] delete_resource_config
- [X] delete_retention_configuration This will delete the retention configuration if one is present with the provided name.
- [ ] delete_stored_query
- [ ] deliver_config_snapshot
- [ ] describe_aggregate_compliance_by_config_rules
- [ ] describe_aggregate_compliance_by_conformance_packs
- [X] describe_aggregation_authorizations
- [ ] describe_compliance_by_config_rule
- [ ] describe_compliance_by_resource
- [ ] describe_config_rule_evaluation_status
- [X] describe_config_rules Return details for the given ConfigRule names or for all rules.
- [ ] describe_configuration_aggregator_sources_status

- [X] describe_configuration_aggregators
- [X] describe_configuration_recorder_status
- [X] describe_configuration_recorders
- [ ] describe_conformance_pack_compliance
- [ ] describe_conformance_pack_status
- [ ] describe_conformance_packs
- [ ] describe_delivery_channel_status
- [X] describe_delivery_channels
- [ ] describe_organization_config_rule_statuses
- [ ] describe_organization_config_rules
- [X] describe_organization_conformance_pack_statuses
- [X] describe_organization_conformance_packs
- [ ] describe_pending_aggregation_requests
- [ ] describe_remediation_configurations
- [ ] describe_remediation_exceptions
- [ ] describe_remediation_execution_status
- [X] describe_retention_configurations

  This will return the retention configuration if one is present.

  This should only receive at most 1 name in. It will raise a ValidationException if more than 1 is supplied.
- [ ] get_aggregate_compliance_details_by_config_rule
- [ ] get_aggregate_config_rule_compliance_summary
- [ ] get_aggregate_conformance_pack_compliance_summary
- [ ] get_aggregate_discovered_resource_counts
- [ ] get_aggregate_resource_config
- [ ] get_compliance_details_by_config_rule
- [ ] get_compliance_details_by_resource
- [ ] get_compliance_summary_by_config_rule
- [ ] get_compliance_summary_by_resource_type
- [ ] get_conformance_pack_compliance_details
- [ ] get_conformance_pack_compliance_summary
- [ ] get_custom_rule_policy
- [ ] get_discovered_resource_counts
- [ ] get_organization_config_rule_detailed_status
- [X] get_organization_conformance_pack_detailed_status
- [ ] get_organization_custom_rule_policy

- [X] get_resource_config_history Returns configuration of resource for the current regional backend.

  Item returned in AWS Config format.

  NOTE: This is –NOT– returning history as it is not supported in moto at this time. (PR's welcome!)

  As such, the later_time, earlier_time, limit, and next_token are ignored as this will only return 1 item. (If no items, it raises an exception).

- [ ] get_resource_evaluation_summary
- [ ] get_stored_query
- [X] list_aggregate_discovered_resources Queries AWS Config listing function that must exist for resource backend.

  As far a moto goes – the only real difference between this function and the *list_discovered_resources* function is that this will require a Config Aggregator be set up a priori and can search based on resource regions.

  **param aggregator_name**
  **param resource_type**
  **param filters**
  **param limit**
  **param next_token**
  **return**

- [ ] list_conformance_pack_compliance_scores
- [X] list_discovered_resources Queries against AWS Config (non-aggregated) listing function.

  The listing function must exist for the resource backend.

  **param resource_type**
  **param backend_region**
  **param ids**
  **param name**
  **param limit**
  **param next_token**
  **return**

- [ ] list_resource_evaluations
- [ ] list_stored_queries
- [X] list_tags_for_resource Return list of tags for AWS Config resource.
- [X] put_aggregation_authorization
- [X] put_config_rule Add/Update config rule for evaluating resource compliance.

  TBD - Only the "accounting" of config rules are handled at the moment. No events are created or triggered. There is no interaction with the config recorder.

- [X] put_configuration_aggregator
- [X] put_configuration_recorder
- [ ] put_conformance_pack
- [X] put_delivery_channel
- [X] put_evaluations
- [ ] put_external_evaluation

- [ ] put_organization_config_rule
- [X] put_organization_conformance_pack
- [ ] put_remediation_configurations
- [ ] put_remediation_exceptions
- [ ] put_resource_config
- [X] put_retention_configuration Creates a Retention Configuration.
- [ ] put_stored_query
- [ ] select_aggregate_resource_config
- [ ] select_resource_config
- [ ] start_config_rules_evaluation
- [X] start_configuration_recorder
- [ ] start_remediation_execution
- [ ] start_resource_evaluation
- [X] stop_configuration_recorder
- [X] tag_resource Add tags in config with a matching ARN.
- [X] untag_resource Remove tags in config with a matching ARN.

  If the tags in the tag_keys don't match any keys for that ARN, they're just ignored.

### 2.10.28 databrew

Implemented features for this service

- [ ] batch_delete_recipe_version
- [X] create_dataset
- [X] create_profile_job
- [ ] create_project
- [X] create_recipe
- [X] create_recipe_job
- [X] create_ruleset
- [ ] create_schedule
- [X] delete_dataset
- [X] delete_job
- [ ] delete_project
- [X] delete_recipe_version
- [X] delete_ruleset
- [ ] delete_schedule
- [X] describe_dataset
- [X] describe_job

- [ ] describe_job_run
- [ ] describe_project
- [X] describe_recipe
- [X] describe_ruleset
- [ ] describe_schedule
- [X] list_datasets
- [ ] list_job_runs
- [X] list_jobs
- [ ] list_projects
- [X] list_recipe_versions
- [X] list_recipes
- [X] list_rulesets
- [ ] list_schedules
- [ ] list_tags_for_resource
- [X] publish_recipe
- [ ] send_project_session_action
- [ ] start_job_run
- [ ] start_project_session
- [ ] stop_job_run
- [ ] tag_resource
- [ ] untag_resource
- [X] update_dataset
- [X] update_profile_job
- [ ] update_project
- [X] update_recipe
- [X] update_recipe_job
- [X] update_ruleset
- [ ] update_schedule

### 2.10.29 datapipeline

Implemented features for this service

- [X] activate_pipeline
- [ ] add_tags
- [X] create_pipeline
- [ ] deactivate_pipeline
- [X] delete_pipeline

- [X] describe_objects
- [X] describe_pipelines
- [ ] evaluate_expression
- [X] get_pipeline_definition
- [X] list_pipelines
- [ ] poll_for_task
- [X] put_pipeline_definition
- [ ] query_objects
- [ ] remove_tags
- [ ] report_task_progress
- [ ] report_task_runner_heartbeat
- [ ] set_status
- [ ] set_task_status
- [ ] validate_pipeline_definition

### 2.10.30 datasync

Implemented features for this service

- [ ] add_storage_system
- [X] cancel_task_execution
- [ ] create_agent
- [ ] create_location_azure_blob
- [ ] create_location_efs
- [ ] create_location_fsx_lustre
- [ ] create_location_fsx_ontap
- [ ] create_location_fsx_open_zfs
- [ ] create_location_fsx_windows
- [ ] create_location_hdfs
- [ ] create_location_nfs
- [ ] create_location_object_storage
- [ ] create_location_s3
- [ ] create_location_smb
- [X] create_task
- [ ] delete_agent
- [X] delete_location
- [X] delete_task
- [ ] describe_agent

- [ ] describe_discovery_job
- [ ] describe_location_azure_blob
- [ ] describe_location_efs
- [ ] describe_location_fsx_lustre
- [ ] describe_location_fsx_ontap
- [ ] describe_location_fsx_open_zfs
- [ ] describe_location_fsx_windows
- [ ] describe_location_hdfs
- [ ] describe_location_nfs
- [ ] describe_location_object_storage
- [ ] describe_location_s3
- [ ] describe_location_smb
- [ ] describe_storage_system
- [ ] describe_storage_system_resource_metrics
- [ ] describe_storage_system_resources
- [ ] describe_task
- [ ] describe_task_execution
- [ ] generate_recommendations
- [ ] list_agents
- [ ] list_discovery_jobs
- [ ] list_locations
- [ ] list_storage_systems
- [ ] list_tags_for_resource
- [ ] list_task_executions
- [ ] list_tasks
- [ ] remove_storage_system
- [ ] start_discovery_job
- [X] start_task_execution
- [ ] stop_discovery_job
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_agent
- [ ] update_discovery_job
- [ ] update_location_azure_blob
- [ ] update_location_hdfs
- [ ] update_location_nfs

- [ ] update_location_object_storage
- [ ] update_location_smb
- [ ] update_storage_system
- [X] update_task
- [ ] update_task_execution

### 2.10.31 dax

Implemented features for this service

- [X] create_cluster

  The following parameters are not yet processed: AvailabilityZones, SubnetGroupNames, SecurityGroups, PreferredMaintenanceWindow, NotificationTopicArn, ParameterGroupName

- [ ] create_parameter_group
- [ ] create_subnet_group
- [X] decrease_replication_factor

  The AvailabilityZones-parameter is not yet implemented

- [X] delete_cluster
- [ ] delete_parameter_group
- [ ] delete_subnet_group
- [X] describe_clusters
- [ ] describe_default_parameters
- [ ] describe_events
- [ ] describe_parameter_groups
- [ ] describe_parameters
- [ ] describe_subnet_groups
- [X] increase_replication_factor

  The AvailabilityZones-parameter is not yet implemented

- [X] list_tags

  Pagination is not yet implemented

- [ ] reboot_node
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_cluster
- [ ] update_parameter_group
- [ ] update_subnet_group

### 2.10.32 dms

Implemented features for this service

- [ ] add_tags_to_resource
- [ ] apply_pending_maintenance_action
- [ ] batch_start_recommendations
- [ ] cancel_replication_task_assessment_run
- [ ] create_data_provider
- [ ] create_endpoint
- [ ] create_event_subscription
- [ ] create_fleet_advisor_collector
- [ ] create_instance_profile
- [ ] create_migration_project
- [ ] create_replication_config
- [ ] create_replication_instance
- [ ] create_replication_subnet_group
- [X] create_replication_task

  The following parameters are not yet implemented: CDCStartTime, CDCStartPosition, CDCStopPosition, Tags, TaskData, ResourceIdentifier
- [ ] delete_certificate
- [ ] delete_connection
- [ ] delete_data_provider
- [ ] delete_endpoint
- [ ] delete_event_subscription
- [ ] delete_fleet_advisor_collector
- [ ] delete_fleet_advisor_databases
- [ ] delete_instance_profile
- [ ] delete_migration_project
- [ ] delete_replication_config
- [ ] delete_replication_instance
- [ ] delete_replication_subnet_group
- [X] delete_replication_task
- [ ] delete_replication_task_assessment_run
- [ ] describe_account_attributes
- [ ] describe_applicable_individual_assessments
- [ ] describe_certificates
- [ ] describe_connections

- [ ] describe_conversion_configuration
- [ ] describe_data_providers
- [ ] describe_endpoint_settings
- [ ] describe_endpoint_types
- [ ] describe_endpoints
- [ ] describe_engine_versions
- [ ] describe_event_categories
- [ ] describe_event_subscriptions
- [ ] describe_events
- [ ] describe_extension_pack_associations
- [ ] describe_fleet_advisor_collectors
- [ ] describe_fleet_advisor_databases
- [ ] describe_fleet_advisor_lsa_analysis
- [ ] describe_fleet_advisor_schema_object_summary
- [ ] describe_fleet_advisor_schemas
- [ ] describe_instance_profiles
- [ ] describe_metadata_model_assessments
- [ ] describe_metadata_model_conversions
- [ ] describe_metadata_model_exports_as_script
- [ ] describe_metadata_model_exports_to_target
- [ ] describe_metadata_model_imports
- [ ] describe_migration_projects
- [ ] describe_orderable_replication_instances
- [ ] describe_pending_maintenance_actions
- [ ] describe_recommendation_limitations
- [ ] describe_recommendations
- [ ] describe_refresh_schemas_status
- [ ] describe_replication_configs
- [ ] describe_replication_instance_task_logs
- [ ] describe_replication_instances
- [ ] describe_replication_subnet_groups
- [ ] describe_replication_table_statistics
- [ ] describe_replication_task_assessment_results
- [ ] describe_replication_task_assessment_runs
- [ ] describe_replication_task_individual_assessments
- [X] describe_replication_tasks

The parameter WithoutSettings has not yet been implemented

- [ ] describe_replications
- [ ] describe_schemas
- [ ] describe_table_statistics
- [ ] export_metadata_model_assessment
- [ ] import_certificate
- [ ] list_tags_for_resource
- [ ] modify_conversion_configuration
- [ ] modify_data_provider
- [ ] modify_endpoint
- [ ] modify_event_subscription
- [ ] modify_instance_profile
- [ ] modify_migration_project
- [ ] modify_replication_config
- [ ] modify_replication_instance
- [ ] modify_replication_subnet_group
- [ ] modify_replication_task
- [ ] move_replication_task
- [ ] reboot_replication_instance
- [ ] refresh_schemas
- [ ] reload_replication_tables
- [ ] reload_tables
- [ ] remove_tags_from_resource
- [ ] run_fleet_advisor_lsa_analysis
- [ ] start_extension_pack_association
- [ ] start_metadata_model_assessment
- [ ] start_metadata_model_conversion
- [ ] start_metadata_model_export_as_script
- [ ] start_metadata_model_export_to_target
- [ ] start_metadata_model_import
- [ ] start_recommendations
- [ ] start_replication
- [X] start_replication_task

  The following parameters have not yet been implemented: StartReplicationTaskType, CDCStartTime, CDCStartPosition, CDCStopPosition

- [ ] start_replication_task_assessment

- [ ] start_replication_task_assessment_run
- [ ] stop_replication
- [X] stop_replication_task
- [ ] test_connection
- [ ] update_subscriptions_to_event_bridge

### 2.10.33 ds

**class** moto.ds.models.**DirectoryServiceBackend**(*region_name: str*, *account_id: str*)

Implementation of DirectoryService APIs.

Implemented features for this service

- [ ] accept_shared_directory
- [ ] add_ip_routes
- [ ] add_region
- [X] add_tags_to_resource Add or overwrite one or more tags for specified directory.
- [ ] cancel_schema_extension
- [X] connect_directory Create a fake AD Connector.
- [X] create_alias Create and assign an alias to a directory.
- [ ] create_computer
- [ ] create_conditional_forwarder
- [X] create_directory Create a fake Simple Ad Directory.
- [ ] create_log_subscription
- [X] create_microsoft_ad Create a fake Microsoft Ad Directory.
- [ ] create_snapshot
- [ ] create_trust
- [ ] delete_conditional_forwarder
- [X] delete_directory Delete directory with the matching ID.
- [ ] delete_log_subscription
- [ ] delete_snapshot
- [ ] delete_trust
- [ ] deregister_certificate
- [ ] deregister_event_topic
- [ ] describe_certificate
- [ ] describe_client_authentication_settings
- [ ] describe_conditional_forwarders
- [X] describe_directories Return info on all directories or directories with matching IDs.
- [ ] describe_domain_controllers

- [ ] describe_event_topics
- [ ] describe_ldaps_settings
- [ ] describe_regions
- [ ] describe_settings
- [ ] describe_shared_directories
- [ ] describe_snapshots
- [ ] describe_trusts
- [ ] describe_update_directory
- [ ] disable_client_authentication
- [ ] disable_ldaps
- [ ] disable_radius
- [X] disable_sso Disable single-sign on for a directory.
- [ ] enable_client_authentication
- [ ] enable_ldaps
- [ ] enable_radius
- [X] enable_sso Enable single-sign on for a directory.
- [X] get_directory_limits Return hard-coded limits for the directories.
- [ ] get_snapshot_limits
- [ ] list_certificates
- [ ] list_ip_routes
- [ ] list_log_subscriptions
- [ ] list_schema_extensions
- [X] list_tags_for_resource List all tags on a directory.
- [ ] register_certificate
- [ ] register_event_topic
- [ ] reject_shared_directory
- [ ] remove_ip_routes
- [ ] remove_region
- [X] remove_tags_from_resource Removes tags from a directory.
- [ ] reset_user_password
- [ ] restore_from_snapshot
- [ ] share_directory
- [ ] start_schema_extension
- [ ] unshare_directory
- [ ] update_conditional_forwarder
- [ ] update_directory_setup

- [ ] update_number_of_domain_controllers
- [ ] update_radius
- [ ] update_settings
- [ ] update_trust
- [ ] verify_trust

### 2.10.34 dynamodb

Implemented features for this service

- [X] batch_execute_statement

  Please see the documentation for *execute_statement* to see the limitations of what is supported.
- [X] batch_get_item
- [X] batch_write_item
- [X] create_backup
- [ ] create_global_table
- [X] create_table
- [X] delete_backup
- [X] delete_item
- [X] delete_table
- [X] describe_backup
- [X] describe_continuous_backups
- [ ] describe_contributor_insights
- [X] describe_endpoints
- [ ] describe_export
- [ ] describe_global_table
- [ ] describe_global_table_settings
- [ ] describe_import
- [ ] describe_kinesis_streaming_destination
- [ ] describe_limits
- [X] describe_table
- [ ] describe_table_replica_auto_scaling
- [X] describe_time_to_live
- [ ] disable_kinesis_streaming_destination
- [ ] enable_kinesis_streaming_destination
- [X] execute_statement

  Pagination is not yet implemented.

  Parsing is highly experimental - please raise an issue if you find any bugs.

- [X] execute_transaction

  Please see the documentation for *execute_statement* to see the limitations of what is supported.

- [ ] export_table_to_point_in_time
- [X] get_item
- [ ] import_table
- [X] list_backups
- [ ] list_contributor_insights
- [ ] list_exports
- [ ] list_global_tables
- [ ] list_imports
- [X] list_tables
- [X] list_tags_of_resource
- [X] put_item
- [X] query
- [X] restore_table_from_backup
- [X] restore_table_to_point_in_time

  Currently this only accepts the source and target table elements, and will copy all items from the source without respect to other arguments.

- [X] scan
- [X] tag_resource
- [X] transact_get_items
- [X] transact_write_items
- [X] untag_resource
- [X] update_continuous_backups
- [ ] update_contributor_insights
- [ ] update_global_table
- [ ] update_global_table_settings
- [X] update_item
- [ ] update_kinesis_streaming_destination
- [X] update_table
- [ ] update_table_replica_auto_scaling
- [X] update_time_to_live

### 2.10.35 dynamodbstreams

Implemented features for this service

- [X] describe_stream
- [X] get_records
- [X] get_shard_iterator
- [X] list_streams

### 2.10.36 ebs

**class** moto.ebs.models.**EBSBackend**(*region_name: str*, *account_id: str*)

Implementation of EBS APIs.

Implemented features for this service

- [X] complete_snapshot
- [X] get_snapshot_block

  The BlockToken-parameter is not yet implemented
- [X] list_changed_blocks

  The following parameters are not yet implemented: NextToken, MaxResults, StartingBlockIndex
- [X] list_snapshot_blocks
- [X] put_snapshot_block
- [X] start_snapshot

### 2.10.37 ec2

**class** moto.ec2.models.**EC2Backend**(**args: Any*, ***kwargs: Any*)

moto includes a limited set of AMIs in *moto/ec2/resources/amis.json*. Additionally, the default AMI's specified by SSM will be provided.

If you require specific AMIs to be available during your tests, you can provide your own AMI definitions by setting the environment variable *MOTO_AMIS_PATH* to point to a JSON file containing definitions of the required AMIs. No other AMI's will be loaded if this environment variable is set.

To create such a file, refer to *scripts/get_amis.py*

---

**Note:** You must set *MOTO_AMIS_PATH* before importing moto.

---

Implemented features for this service

- [ ] accept_address_transfer
- [ ] accept_reserved_instances_exchange_quote
- [ ] accept_transit_gateway_multicast_domain_associations
- [X] accept_transit_gateway_peering_attachment
- [ ] accept_transit_gateway_vpc_attachment

- [ ] accept_vpc_endpoint_connections
- [X] accept_vpc_peering_connection
- [ ] advertise_byoip_cidr
- [X] allocate_address
- [X] allocate_hosts
- [ ] allocate_ipam_pool_cidr
- [ ] apply_security_groups_to_client_vpn_target_network
- [X] assign_ipv6_addresses
- [X] assign_private_ip_addresses
- [ ] assign_private_nat_gateway_address
- [X] associate_address
- [ ] associate_client_vpn_target_network
- [X] associate_dhcp_options
- [ ] associate_enclave_certificate_iam_role
- [X] associate_iam_instance_profile
- [ ] associate_instance_event_window
- [ ] associate_ipam_byoasn
- [ ] associate_ipam_resource_discovery
- [ ] associate_nat_gateway_address
- [X] associate_route_table
- [X] associate_subnet_cidr_block
- [ ] associate_transit_gateway_multicast_domain
- [ ] associate_transit_gateway_policy_table
- [X] associate_transit_gateway_route_table
- [ ] associate_trunk_interface
- [X] associate_vpc_cidr_block
- [ ] attach_classic_link_vpc
- [X] attach_internet_gateway
- [X] attach_network_interface
- [ ] attach_verified_access_trust_provider
- [X] attach_volume
- [X] attach_vpn_gateway
- [ ] authorize_client_vpn_ingress
- [X] authorize_security_group_egress
- [X] authorize_security_group_ingress
- [ ] bundle_instance

- [ ] cancel_bundle_task
- [ ] cancel_capacity_reservation
- [ ] cancel_capacity_reservation_fleets
- [ ] cancel_conversion_task
- [ ] cancel_export_task
- [ ] cancel_image_launch_permission
- [ ] cancel_import_task
- [ ] cancel_reserved_instances_listing
- [X] cancel_spot_fleet_requests
- [X] cancel_spot_instance_requests
- [ ] confirm_product_instance
- [ ] copy_fpga_image
- [X] copy_image
- [X] copy_snapshot
- [ ] create_capacity_reservation
- [ ] create_capacity_reservation_fleet
- [X] create_carrier_gateway
- [ ] create_client_vpn_endpoint
- [ ] create_client_vpn_route
- [ ] create_coip_cidr
- [ ] create_coip_pool
- [X] create_customer_gateway
- [ ] create_default_subnet
- [X] create_default_vpc
- [X] create_dhcp_options
- [X] create_egress_only_internet_gateway
- [X] create_fleet
- [X] create_flow_logs
- [ ] create_fpga_image
- [X] create_image
- [ ] create_instance_connect_endpoint
- [ ] create_instance_event_window
- [ ] create_instance_export_task
- [X] create_internet_gateway
- [ ] create_ipam
- [ ] create_ipam_pool

- [ ] create_ipam_resource_discovery
- [ ] create_ipam_scope
- [X] create_key_pair
- [X] create_launch_template
- [ ] create_launch_template_version
- [ ] create_local_gateway_route
- [ ] create_local_gateway_route_table
- [ ] create_local_gateway_route_table_virtual_interface_group_association
- [ ] create_local_gateway_route_table_vpc_association
- [X] create_managed_prefix_list
- [X] create_nat_gateway
- [X] create_network_acl
- [X] create_network_acl_entry
- [ ] create_network_insights_access_scope
- [ ] create_network_insights_path
- [X] create_network_interface
- [ ] create_network_interface_permission
- [ ] create_placement_group
- [ ] create_public_ipv4_pool
- [ ] create_replace_root_volume_task
- [ ] create_reserved_instances_listing
- [ ] create_restore_image_task
- [X] create_route
- [X] create_route_table
- [X] create_security_group
- [X] create_snapshot
- [X] create_snapshots

  The CopyTagsFromSource-parameter is not yet implemented.
- [ ] create_spot_datafeed_subscription
- [ ] create_store_image_task
- [X] create_subnet
- [ ] create_subnet_cidr_reservation
- [X] create_tags
- [ ] create_traffic_mirror_filter
- [ ] create_traffic_mirror_filter_rule
- [ ] create_traffic_mirror_session

- [ ] create_traffic_mirror_target
- [X] create_transit_gateway
- [ ] create_transit_gateway_connect
- [ ] create_transit_gateway_connect_peer
- [ ] create_transit_gateway_multicast_domain
- [X] create_transit_gateway_peering_attachment
- [ ] create_transit_gateway_policy_table
- [ ] create_transit_gateway_prefix_list_reference
- [X] create_transit_gateway_route
- [X] create_transit_gateway_route_table
- [ ] create_transit_gateway_route_table_announcement
- [X] create_transit_gateway_vpc_attachment
- [ ] create_verified_access_endpoint
- [ ] create_verified_access_group
- [ ] create_verified_access_instance
- [ ] create_verified_access_trust_provider
- [X] create_volume
- [X] create_vpc
- [X] create_vpc_endpoint
- [ ] create_vpc_endpoint_connection_notification
- [X] create_vpc_endpoint_service_configuration
- [X] create_vpc_peering_connection
- [X] create_vpn_connection
- [ ] create_vpn_connection_route
- [X] create_vpn_gateway
- [X] delete_carrier_gateway
- [ ] delete_client_vpn_endpoint
- [ ] delete_client_vpn_route
- [ ] delete_coip_cidr
- [ ] delete_coip_pool
- [X] delete_customer_gateway
- [ ] delete_dhcp_options
- [X] delete_egress_only_internet_gateway
- [X] delete_fleets
- [X] delete_flow_logs
- [ ] delete_fpga_image

- [ ] delete_instance_connect_endpoint
- [ ] delete_instance_event_window
- [X] delete_internet_gateway
- [ ] delete_ipam
- [ ] delete_ipam_pool
- [ ] delete_ipam_resource_discovery
- [ ] delete_ipam_scope
- [X] delete_key_pair
- [X] delete_launch_template
- [ ] delete_launch_template_versions
- [ ] delete_local_gateway_route
- [ ] delete_local_gateway_route_table
- [ ] delete_local_gateway_route_table_virtual_interface_group_association
- [ ] delete_local_gateway_route_table_vpc_association
- [X] delete_managed_prefix_list
- [X] delete_nat_gateway
- [X] delete_network_acl
- [X] delete_network_acl_entry
- [ ] delete_network_insights_access_scope
- [ ] delete_network_insights_access_scope_analysis
- [ ] delete_network_insights_analysis
- [ ] delete_network_insights_path
- [X] delete_network_interface
- [ ] delete_network_interface_permission
- [ ] delete_placement_group
- [ ] delete_public_ipv4_pool
- [ ] delete_queued_reserved_instances
- [X] delete_route
- [X] delete_route_table
- [X] delete_security_group
- [X] delete_snapshot
- [ ] delete_spot_datafeed_subscription
- [X] delete_subnet
- [ ] delete_subnet_cidr_reservation
- [X] delete_tags
- [ ] delete_traffic_mirror_filter

- [ ] delete_traffic_mirror_filter_rule
- [ ] delete_traffic_mirror_session
- [ ] delete_traffic_mirror_target
- [X] delete_transit_gateway
- [ ] delete_transit_gateway_connect
- [ ] delete_transit_gateway_connect_peer
- [ ] delete_transit_gateway_multicast_domain
- [X] delete_transit_gateway_peering_attachment
- [ ] delete_transit_gateway_policy_table
- [ ] delete_transit_gateway_prefix_list_reference
- [X] delete_transit_gateway_route
- [X] delete_transit_gateway_route_table
- [ ] delete_transit_gateway_route_table_announcement
- [X] delete_transit_gateway_vpc_attachment
- [ ] delete_verified_access_endpoint
- [ ] delete_verified_access_group
- [ ] delete_verified_access_instance
- [ ] delete_verified_access_trust_provider
- [X] delete_volume
- [X] delete_vpc
- [ ] delete_vpc_endpoint_connection_notifications
- [X] delete_vpc_endpoint_service_configurations
- [X] delete_vpc_endpoints
- [X] delete_vpc_peering_connection
- [X] delete_vpn_connection
- [ ] delete_vpn_connection_route
- [X] delete_vpn_gateway
- [ ] deprovision_byoip_cidr
- [ ] deprovision_ipam_byoasn
- [ ] deprovision_ipam_pool_cidr
- [ ] deprovision_public_ipv4_pool_cidr
- [X] deregister_image
- [ ] deregister_instance_event_notification_attributes
- [ ] deregister_transit_gateway_multicast_group_members
- [ ] deregister_transit_gateway_multicast_group_sources
- [ ] describe_account_attributes

- [ ] describe_address_transfers
- [X] describe_addresses
- [ ] describe_addresses_attribute
- [ ] describe_aggregate_id_format
- [X] describe_availability_zones

  The following parameters are supported: ZoneIds, ZoneNames, Filters The following filters are supported: zone-id, zone-type, zone-name, region-name, state
- [ ] describe_aws_network_performance_metric_subscriptions
- [ ] describe_bundle_tasks
- [ ] describe_byoip_cidrs
- [ ] describe_capacity_block_offerings
- [ ] describe_capacity_reservation_fleets
- [ ] describe_capacity_reservations
- [X] describe_carrier_gateways
- [ ] describe_classic_link_instances
- [ ] describe_client_vpn_authorization_rules
- [ ] describe_client_vpn_connections
- [ ] describe_client_vpn_endpoints
- [ ] describe_client_vpn_routes
- [ ] describe_client_vpn_target_networks
- [ ] describe_coip_pools
- [ ] describe_conversion_tasks
- [X] describe_customer_gateways
- [X] describe_dhcp_options
- [X] describe_egress_only_internet_gateways

  The Filters-argument is not yet supported
- [ ] describe_elastic_gpus
- [ ] describe_export_image_tasks
- [ ] describe_export_tasks
- [ ] describe_fast_launch_images
- [ ] describe_fast_snapshot_restores
- [ ] describe_fleet_history
- [X] describe_fleet_instances
- [X] describe_fleets
- [X] describe_flow_logs
- [ ] describe_fpga_image_attribute

- [ ] describe_fpga_images
- [ ] describe_host_reservation_offerings
- [ ] describe_host_reservations
- [X] describe_hosts

  Pagination is not yet implemented
- [X] describe_iam_instance_profile_associations
- [ ] describe_id_format
- [ ] describe_identity_id_format
- [X] describe_image_attribute
- [X] describe_images
- [ ] describe_import_image_tasks
- [ ] describe_import_snapshot_tasks
- [X] describe_instance_attribute
- [ ] describe_instance_connect_endpoints
- [X] describe_instance_credit_specifications
- [ ] describe_instance_event_notification_attributes
- [ ] describe_instance_event_windows
- [X] describe_instance_status
- [ ] describe_instance_topology
- [X] describe_instance_type_offerings
- [X] describe_instance_types
- [X] describe_instances
- [X] describe_internet_gateways
- [ ] describe_ipam_byoasn
- [ ] describe_ipam_pools
- [ ] describe_ipam_resource_discoveries
- [ ] describe_ipam_resource_discovery_associations
- [ ] describe_ipam_scopes
- [ ] describe_ipams
- [ ] describe_ipv6_pools
- [X] describe_key_pairs
- [ ] describe_launch_template_versions
- [X] describe_launch_templates
- [ ] describe_local_gateway_route_table_virtual_interface_group_associations
- [ ] describe_local_gateway_route_table_vpc_associations
- [ ] describe_local_gateway_route_tables

- [ ] describe_local_gateway_virtual_interface_groups
- [ ] describe_local_gateway_virtual_interfaces
- [ ] describe_local_gateways
- [ ] describe_locked_snapshots
- [X] describe_managed_prefix_lists
- [ ] describe_moving_addresses
- [X] describe_nat_gateways
- [X] describe_network_acls
- [ ] describe_network_insights_access_scope_analyses
- [ ] describe_network_insights_access_scopes
- [ ] describe_network_insights_analyses
- [ ] describe_network_insights_paths
- [ ] describe_network_interface_attribute
- [ ] describe_network_interface_permissions
- [X] describe_network_interfaces
- [ ] describe_placement_groups
- [ ] describe_prefix_lists
- [ ] describe_principal_id_format
- [ ] describe_public_ipv4_pools
- [X] describe_regions
- [ ] describe_replace_root_volume_tasks
- [ ] describe_reserved_instances
- [ ] describe_reserved_instances_listings
- [ ] describe_reserved_instances_modifications
- [ ] describe_reserved_instances_offerings
- [X] describe_route_tables
- [ ] describe_scheduled_instance_availability
- [ ] describe_scheduled_instances
- [ ] describe_security_group_references
- [X] describe_security_group_rules
- [X] describe_security_groups
- [ ] describe_snapshot_attribute
- [ ] describe_snapshot_tier_status
- [X] describe_snapshots
- [ ] describe_spot_datafeed_subscription
- [X] describe_spot_fleet_instances

- [ ] describe_spot_fleet_request_history
- [X] describe_spot_fleet_requests
- [X] describe_spot_instance_requests
- [X] describe_spot_price_history
- [ ] describe_stale_security_groups
- [ ] describe_store_image_tasks
- [X] describe_subnets
- [X] describe_tags
- [ ] describe_traffic_mirror_filters
- [ ] describe_traffic_mirror_sessions
- [ ] describe_traffic_mirror_targets
- [X] describe_transit_gateway_attachments
- [ ] describe_transit_gateway_connect_peers
- [ ] describe_transit_gateway_connects
- [ ] describe_transit_gateway_multicast_domains
- [X] describe_transit_gateway_peering_attachments
- [ ] describe_transit_gateway_policy_tables
- [ ] describe_transit_gateway_route_table_announcements
- [ ] describe_transit_gateway_route_tables
- [X] describe_transit_gateway_vpc_attachments
- [X] describe_transit_gateways
- [ ] describe_trunk_interface_associations
- [ ] describe_verified_access_endpoints
- [ ] describe_verified_access_groups
- [ ] describe_verified_access_instance_logging_configurations
- [ ] describe_verified_access_instances
- [ ] describe_verified_access_trust_providers
- [ ] describe_volume_attribute
- [ ] describe_volume_status
- [X] describe_volumes
- [X] describe_volumes_modifications
- [X] describe_vpc_attribute
- [ ] describe_vpc_classic_link
- [ ] describe_vpc_classic_link_dns_support
- [ ] describe_vpc_endpoint_connection_notifications
- [ ] describe_vpc_endpoint_connections

- [X] describe_vpc_endpoint_service_configurations

  The Filters, MaxResults, NextToken parameters are not yet implemented

- [X] describe_vpc_endpoint_service_permissions

  The Filters, MaxResults, NextToken parameters are not yet implemented

- [X] describe_vpc_endpoint_services Return info on services to which you can create a VPC endpoint.

  Currently only the default endpoint services are returned. When create_vpc_endpoint_service_configuration() is implemented, a list of those private endpoints would be kept and when this API is invoked, those private endpoints would be added to the list of default endpoint services.

  The DryRun parameter is ignored.

- [X] describe_vpc_endpoints
- [X] describe_vpc_peering_connections
- [X] describe_vpcs
- [X] describe_vpn_connections
- [X] describe_vpn_gateways
- [ ] detach_classic_link_vpc
- [X] detach_internet_gateway
- [X] detach_network_interface
- [ ] detach_verified_access_trust_provider
- [X] detach_volume
- [X] detach_vpn_gateway
- [ ] disable_address_transfer
- [ ] disable_aws_network_performance_metric_subscription
- [X] disable_ebs_encryption_by_default
- [ ] disable_fast_launch
- [ ] disable_fast_snapshot_restores
- [ ] disable_image
- [ ] disable_image_block_public_access
- [ ] disable_image_deprecation
- [ ] disable_ipam_organization_admin_account
- [ ] disable_serial_console_access
- [ ] disable_snapshot_block_public_access
- [X] disable_transit_gateway_route_table_propagation
- [ ] disable_vgw_route_propagation
- [X] disable_vpc_classic_link
- [X] disable_vpc_classic_link_dns_support
- [X] disassociate_address

- [ ] disassociate_client_vpn_target_network
- [ ] disassociate_enclave_certificate_iam_role
- [X] disassociate_iam_instance_profile
- [ ] disassociate_instance_event_window
- [ ] disassociate_ipam_byoasn
- [ ] disassociate_ipam_resource_discovery
- [ ] disassociate_nat_gateway_address
- [X] disassociate_route_table
- [X] disassociate_subnet_cidr_block
- [ ] disassociate_transit_gateway_multicast_domain
- [ ] disassociate_transit_gateway_policy_table
- [X] disassociate_transit_gateway_route_table
- [ ] disassociate_trunk_interface
- [X] disassociate_vpc_cidr_block
- [ ] enable_address_transfer
- [ ] enable_aws_network_performance_metric_subscription
- [X] enable_ebs_encryption_by_default
- [ ] enable_fast_launch
- [ ] enable_fast_snapshot_restores
- [ ] enable_image
- [ ] enable_image_block_public_access
- [ ] enable_image_deprecation
- [ ] enable_ipam_organization_admin_account
- [ ] enable_reachability_analyzer_organization_sharing
- [ ] enable_serial_console_access
- [ ] enable_snapshot_block_public_access
- [X] enable_transit_gateway_route_table_propagation
- [ ] enable_vgw_route_propagation
- [ ] enable_volume_io
- [X] enable_vpc_classic_link
- [X] enable_vpc_classic_link_dns_support
- [ ] export_client_vpn_client_certificate_revocation_list
- [ ] export_client_vpn_client_configuration
- [ ] export_image
- [ ] export_transit_gateway_routes
- [ ] get_associated_enclave_certificate_iam_roles

- [ ] get_associated_ipv6_pool_cidrs
- [ ] get_aws_network_performance_data
- [ ] get_capacity_reservation_usage
- [ ] get_coip_pool_usage
- [ ] get_console_output
- [ ] get_console_screenshot
- [ ] get_default_credit_specification
- [ ] get_ebs_default_kms_key_id
- [X] get_ebs_encryption_by_default
- [ ] get_flow_logs_integration_template
- [ ] get_groups_for_capacity_reservation
- [ ] get_host_reservation_purchase_preview
- [ ] get_image_block_public_access_state
- [ ] get_instance_types_from_instance_requirements
- [ ] get_instance_uefi_data
- [ ] get_ipam_address_history
- [ ] get_ipam_discovered_accounts
- [ ] get_ipam_discovered_public_addresses
- [ ] get_ipam_discovered_resource_cidrs
- [ ] get_ipam_pool_allocations
- [ ] get_ipam_pool_cidrs
- [ ] get_ipam_resource_cidrs
- [X] get_launch_template_data
- [ ] get_managed_prefix_list_associations
- [X] get_managed_prefix_list_entries
- [ ] get_network_insights_access_scope_analysis_findings
- [ ] get_network_insights_access_scope_content
- [X] get_password_data
- [ ] get_reserved_instances_exchange_quote
- [ ] get_security_groups_for_vpc
- [ ] get_serial_console_access_status
- [ ] get_snapshot_block_public_access_state
- [ ] get_spot_placement_scores
- [ ] get_subnet_cidr_reservations
- [ ] get_transit_gateway_attachment_propagations
- [ ] get_transit_gateway_multicast_domain_associations

- [ ] get_transit_gateway_policy_table_associations
- [ ] get_transit_gateway_policy_table_entries
- [ ] get_transit_gateway_prefix_list_references
- [X] get_transit_gateway_route_table_associations
- [X] get_transit_gateway_route_table_propagations
- [ ] get_verified_access_endpoint_policy
- [ ] get_verified_access_group_policy
- [ ] get_vpn_connection_device_sample_configuration
- [ ] get_vpn_connection_device_types
- [ ] get_vpn_tunnel_replacement_status
- [ ] import_client_vpn_client_certificate_revocation_list
- [ ] import_image
- [ ] import_instance
- [X] import_key_pair
- [ ] import_snapshot
- [ ] import_volume
- [ ] list_images_in_recycle_bin
- [ ] list_snapshots_in_recycle_bin
- [ ] lock_snapshot
- [ ] modify_address_attribute
- [ ] modify_availability_zone_group
- [ ] modify_capacity_reservation
- [ ] modify_capacity_reservation_fleet
- [ ] modify_client_vpn_endpoint
- [ ] modify_default_credit_specification
- [ ] modify_ebs_default_kms_key_id
- [ ] modify_fleet
- [ ] modify_fpga_image_attribute
- [X] modify_hosts
- [ ] modify_id_format
- [ ] modify_identity_id_format
- [X] modify_image_attribute
- [X] modify_instance_attribute
- [ ] modify_instance_capacity_reservation_attributes
- [ ] modify_instance_credit_specification
- [ ] modify_instance_event_start_time

- [ ] modify_instance_event_window
- [ ] modify_instance_maintenance_options
- [ ] modify_instance_metadata_options
- [ ] modify_instance_placement
- [ ] modify_ipam
- [ ] modify_ipam_pool
- [ ] modify_ipam_resource_cidr
- [ ] modify_ipam_resource_discovery
- [ ] modify_ipam_scope
- [ ] modify_launch_template
- [ ] modify_local_gateway_route
- [X] modify_managed_prefix_list
- [X] modify_network_interface_attribute
- [ ] modify_private_dns_name_options
- [ ] modify_reserved_instances
- [ ] modify_security_group_rules
- [ ] modify_snapshot_attribute
- [ ] modify_snapshot_tier
- [X] modify_spot_fleet_request
- [X] modify_subnet_attribute
- [ ] modify_traffic_mirror_filter_network_services
- [ ] modify_traffic_mirror_filter_rule
- [ ] modify_traffic_mirror_session
- [X] modify_transit_gateway
- [ ] modify_transit_gateway_prefix_list_reference
- [X] modify_transit_gateway_vpc_attachment
- [ ] modify_verified_access_endpoint
- [ ] modify_verified_access_endpoint_policy
- [ ] modify_verified_access_group
- [ ] modify_verified_access_group_policy
- [ ] modify_verified_access_instance
- [ ] modify_verified_access_instance_logging_configuration
- [ ] modify_verified_access_trust_provider
- [X] modify_volume
- [ ] modify_volume_attribute
- [X] modify_vpc_attribute

- [X] modify_vpc_endpoint
- [ ] modify_vpc_endpoint_connection_notification
- [X] modify_vpc_endpoint_service_configuration

  The following parameters are not yet implemented: RemovePrivateDnsName
- [ ] modify_vpc_endpoint_service_payer_responsibility
- [X] modify_vpc_endpoint_service_permissions
- [X] modify_vpc_peering_connection_options
- [X] modify_vpc_tenancy
- [ ] modify_vpn_connection
- [ ] modify_vpn_connection_options
- [ ] modify_vpn_tunnel_certificate
- [ ] modify_vpn_tunnel_options
- [ ] monitor_instances
- [ ] move_address_to_vpc
- [ ] move_byoip_cidr_to_ipam
- [ ] provision_byoip_cidr
- [ ] provision_ipam_byoasn
- [ ] provision_ipam_pool_cidr
- [ ] provision_public_ipv4_pool_cidr
- [ ] purchase_capacity_block
- [ ] purchase_host_reservation
- [ ] purchase_reserved_instances_offering
- [ ] purchase_scheduled_instances
- [X] reboot_instances
- [X] register_image
- [ ] register_instance_event_notification_attributes
- [ ] register_transit_gateway_multicast_group_members
- [ ] register_transit_gateway_multicast_group_sources
- [ ] reject_transit_gateway_multicast_domain_associations
- [X] reject_transit_gateway_peering_attachment
- [ ] reject_transit_gateway_vpc_attachment
- [ ] reject_vpc_endpoint_connections
- [X] reject_vpc_peering_connection
- [X] release_address
- [X] release_hosts
- [ ] release_ipam_pool_allocation

- [X] replace_iam_instance_profile_association
- [X] replace_network_acl_association
- [X] replace_network_acl_entry
- [X] replace_route
- [X] replace_route_table_association
- [ ] replace_transit_gateway_route
- [ ] replace_vpn_tunnel
- [ ] report_instance_status
- [X] request_spot_fleet
- [X] request_spot_instances
- [ ] reset_address_attribute
- [ ] reset_ebs_default_kms_key_id
- [ ] reset_fpga_image_attribute
- [ ] reset_image_attribute
- [ ] reset_instance_attribute
- [ ] reset_network_interface_attribute
- [ ] reset_snapshot_attribute
- [ ] restore_address_to_classic
- [ ] restore_image_from_recycle_bin
- [ ] restore_managed_prefix_list_version
- [ ] restore_snapshot_from_recycle_bin
- [ ] restore_snapshot_tier
- [ ] revoke_client_vpn_ingress
- [X] revoke_security_group_egress
- [X] revoke_security_group_ingress
- [X] run_instances

  The Placement-parameter is validated to verify the availability-zone exists for the current region.

  The InstanceType-parameter can be validated, to see if it is a known instance-type. Enable this validation by setting the environment variable *MOTO_EC2_ENABLE_INSTANCE_TYPE_VALIDATION=true*

  The ImageId-parameter can be validated, to see if it is a known AMI. Enable this validation by setting the environment variable *MOTO_ENABLE_AMI_VALIDATION=true*

  The KeyPair-parameter can be validated, to see if it is a known key-pair. Enable this validation by setting the environment variable *MOTO_ENABLE_KEYPAIR_VALIDATION=true*

- [ ] run_scheduled_instances
- [ ] search_local_gateway_routes
- [ ] search_transit_gateway_multicast_groups

- [X] search_transit_gateway_routes

  The following filters are currently supported: type, state, route-search.exact-match

- [ ] send_diagnostic_interrupt
- [X] start_instances
- [ ] start_network_insights_access_scope_analysis
- [ ] start_network_insights_analysis
- [ ] start_vpc_endpoint_service_private_dns_verification
- [X] stop_instances
- [ ] terminate_client_vpn_connections
- [X] terminate_instances
- [X] unassign_ipv6_addresses
- [X] unassign_private_ip_addresses
- [ ] unassign_private_nat_gateway_address
- [ ] unlock_snapshot
- [ ] unmonitor_instances
- [X] update_security_group_rule_descriptions_egress
- [X] update_security_group_rule_descriptions_ingress
- [ ] withdraw_byoip_cidr

### 2.10.38 ec2-instance-connect

Implemented features for this service

- [ ] send_serial_console_ssh_public_key
- [X] send_ssh_public_key

### 2.10.39 ecr

Implemented features for this service

- [ ] batch_check_layer_availability
- [X] batch_delete_image
- [X] batch_get_image

  The parameter AcceptedMediaTypes has not yet been implemented

- [X] batch_get_repository_scanning_configuration
- [ ] complete_layer_upload
- [ ] create_pull_through_cache_rule
- [X] create_repository
- [X] delete_lifecycle_policy
- [ ] delete_pull_through_cache_rule

- [X] delete_registry_policy
- [X] delete_repository
- [X] delete_repository_policy
- [ ] describe_image_replication_status
- [X] describe_image_scan_findings
- [X] describe_images
- [ ] describe_pull_through_cache_rules
- [X] describe_registry
- [X] describe_repositories

  maxResults and nextToken not implemented
- [ ] get_authorization_token
- [ ] get_download_url_for_layer
- [X] get_lifecycle_policy
- [ ] get_lifecycle_policy_preview
- [X] get_registry_policy
- [X] get_registry_scanning_configuration
- [X] get_repository_policy
- [ ] initiate_layer_upload
- [X] list_images

  maxResults and filtering not implemented
- [X] list_tags_for_resource
- [X] put_image
- [X] put_image_scanning_configuration
- [X] put_image_tag_mutability
- [X] put_lifecycle_policy
- [X] put_registry_policy
- [X] put_registry_scanning_configuration
- [X] put_replication_configuration
- [X] set_repository_policy
- [X] start_image_scan
- [ ] start_lifecycle_policy_preview
- [X] tag_resource
- [X] untag_resource
- [ ] update_pull_through_cache_rule
- [ ] upload_layer_part
- [ ] validate_pull_through_cache_rule

### 2.10.40 ecs

**class** moto.ecs.models.**EC2ContainerServiceBackend**(*region_name: str*, *account_id: str*)

ECS resources use the new ARN format by default. Use the following environment variable to revert back to the old/short ARN format: *MOTO_ECS_NEW_ARN=false*

AWS reference: https://aws.amazon.com/blogs/compute/migrating-your-amazon-ecs-deployment-to-the-new-arn-and-resource-i

Implemented features for this service

- [X] create_capacity_provider
- [X] create_cluster
- [X] create_service
- [X] create_task_set
- [X] delete_account_setting
- [X] delete_attributes
- [X] delete_capacity_provider
- [X] delete_cluster
- [X] delete_service
- [ ] delete_task_definitions
- [X] delete_task_set

  The Force-parameter is not yet implemented
- [X] deregister_container_instance
- [X] deregister_task_definition
- [X] describe_capacity_providers
- [X] describe_clusters

  Only include=TAGS is currently supported.
- [X] describe_container_instances
- [X] describe_services
- [X] describe_task_definition
- [X] describe_task_sets
- [X] describe_tasks

  Only include=TAGS is currently supported.
- [ ] discover_poll_endpoint
- [ ] execute_command
- [ ] get_task_protection
- [X] list_account_settings
- [X] list_attributes

  Pagination is not yet implemented
- [X] list_clusters

maxSize and pagination not implemented

- [X] list_container_instances
- [X] list_services
- [ ] list_services_by_namespace
- [X] list_tags_for_resource Currently implemented only for task definitions and services
- [X] list_task_definition_families

  The Status and pagination parameters are not yet implemented
- [X] list_task_definitions
- [X] list_tasks
- [X] put_account_setting
- [ ] put_account_setting_default
- [X] put_attributes
- [X] put_cluster_capacity_providers
- [X] register_container_instance
- [X] register_task_definition
- [X] run_task
- [X] start_task
- [X] stop_task
- [ ] submit_attachment_state_changes
- [ ] submit_container_state_change
- [ ] submit_task_state_change
- [X] tag_resource
- [X] untag_resource
- [X] update_capacity_provider
- [X] update_cluster

  The serviceConnectDefaults-parameter is not yet implemented
- [ ] update_cluster_settings
- [ ] update_container_agent
- [X] update_container_instances_state
- [X] update_service
- [X] update_service_primary_task_set Updates task sets be PRIMARY or ACTIVE for given cluster:service task sets
- [ ] update_task_protection
- [X] update_task_set

### 2.10.41 efs

**class** moto.efs.models.**EFSBackend**(*region_name: str*, *account_id: str*)

The backend manager of EFS resources.

This is the state-machine for each region, tracking the file systems, mount targets, and eventually access points that are deployed. Creating, updating, and destroying such resources should always go through this class.

Implemented features for this service

- [X] create_access_point
- [X] create_file_system Create a new EFS File System Volume.

  https://docs.aws.amazon.com/efs/latest/ug/API_CreateFileSystem.html
- [X] create_mount_target Create a new EFS Mount Target for a given File System to a given subnet.

  Note that you can only create one mount target for each availability zone (which is implied by the subnet ID).

  https://docs.aws.amazon.com/efs/latest/ug/API_CreateMountTarget.html
- [ ] create_replication_configuration
- [ ] create_tags
- [X] delete_access_point
- [X] delete_file_system Delete the file system specified by the given file_system_id.

  Note that mount targets must be deleted first.

  https://docs.aws.amazon.com/efs/latest/ug/API_DeleteFileSystem.html
- [ ] delete_file_system_policy
- [X] delete_mount_target Delete a mount target specified by the given mount_target_id.

  Note that this will also delete a network interface.

  https://docs.aws.amazon.com/efs/latest/ug/API_DeleteMountTarget.html
- [ ] delete_replication_configuration
- [ ] delete_tags
- [X] describe_access_points

  Pagination is not yet implemented
- [ ] describe_account_preferences
- [X] describe_backup_policy
- [ ] describe_file_system_policy
- [X] describe_file_systems Describe all the EFS File Systems, or specific File Systems.

  https://docs.aws.amazon.com/efs/latest/ug/API_DescribeFileSystems.html
- [X] describe_lifecycle_configuration
- [X] describe_mount_target_security_groups
- [X] describe_mount_targets Describe the mount targets given an access point ID, mount target ID or a file system ID.

  https://docs.aws.amazon.com/efs/latest/ug/API_DescribeMountTargets.html

- [ ] describe_replication_configurations
- [ ] describe_tags
- [X] list_tags_for_resource
- [X] modify_mount_target_security_groups
- [ ] put_account_preferences
- [ ] put_backup_policy
- [ ] put_file_system_policy
- [X] put_lifecycle_configuration
- [X] tag_resource
- [X] untag_resource
- [ ] update_file_system
- [ ] update_file_system_protection

### 2.10.42 eks

Implemented features for this service

- [ ] associate_access_policy
- [ ] associate_encryption_config
- [ ] associate_identity_provider_config
- [ ] create_access_entry
- [ ] create_addon
- [X] create_cluster
- [ ] create_eks_anywhere_subscription
- [X] create_fargate_profile
- [X] create_nodegroup
- [ ] create_pod_identity_association
- [ ] delete_access_entry
- [ ] delete_addon
- [X] delete_cluster
- [ ] delete_eks_anywhere_subscription
- [X] delete_fargate_profile
- [X] delete_nodegroup
- [ ] delete_pod_identity_association
- [ ] deregister_cluster
- [ ] describe_access_entry
- [ ] describe_addon
- [ ] describe_addon_configuration

- [ ] describe_addon_versions
- [X] describe_cluster
- [ ] describe_eks_anywhere_subscription
- [X] describe_fargate_profile
- [ ] describe_identity_provider_config
- [ ] describe_insight
- [X] describe_nodegroup
- [ ] describe_pod_identity_association
- [ ] describe_update
- [ ] disassociate_access_policy
- [ ] disassociate_identity_provider_config
- [ ] list_access_entries
- [ ] list_access_policies
- [ ] list_addons
- [ ] list_associated_access_policies
- [X] list_clusters
- [ ] list_eks_anywhere_subscriptions
- [X] list_fargate_profiles
- [ ] list_identity_provider_configs
- [ ] list_insights
- [X] list_nodegroups
- [ ] list_pod_identity_associations
- [X] list_tags_for_resource

  This function currently will list tags on an EKS cluster only. It does not list tags from a managed node group

- [ ] list_updates
- [ ] register_cluster
- [X] tag_resource

  This function currently will tag an EKS cluster only. It does not tag a managed node group

- [X] untag_resource

  This function currently will remove tags on an EKS cluster only. It does not remove tags from a managed node group

- [ ] update_access_entry
- [ ] update_addon
- [ ] update_cluster_config
- [ ] update_cluster_version
- [ ] update_eks_anywhere_subscription

- [ ] update_nodegroup_config
- [ ] update_nodegroup_version
- [ ] update_pod_identity_association

### 2.10.43 elasticache

**class** moto.elasticache.models.**ElastiCacheBackend**(*region_name: str*, *account_id: str*)

Implementation of ElastiCache APIs.

Implemented features for this service

- [ ] add_tags_to_resource
- [ ] authorize_cache_security_group_ingress
- [ ] batch_apply_update_action
- [ ] batch_stop_update_action
- [ ] complete_migration
- [ ] copy_serverless_cache_snapshot
- [ ] copy_snapshot
- [X] create_cache_cluster
- [ ] create_cache_parameter_group
- [ ] create_cache_security_group
- [ ] create_cache_subnet_group
- [ ] create_global_replication_group
- [ ] create_replication_group
- [ ] create_serverless_cache
- [ ] create_serverless_cache_snapshot
- [ ] create_snapshot
- [X] create_user
- [ ] create_user_group
- [ ] decrease_node_groups_in_global_replication_group
- [ ] decrease_replica_count
- [X] delete_cache_cluster
- [ ] delete_cache_parameter_group
- [ ] delete_cache_security_group
- [ ] delete_cache_subnet_group
- [ ] delete_global_replication_group
- [ ] delete_replication_group
- [ ] delete_serverless_cache
- [ ] delete_serverless_cache_snapshot

- [ ] delete_snapshot
- [X] delete_user
- [ ] delete_user_group
- [X] describe_cache_clusters
- [ ] describe_cache_engine_versions
- [ ] describe_cache_parameter_groups
- [ ] describe_cache_parameters
- [ ] describe_cache_security_groups
- [ ] describe_cache_subnet_groups
- [ ] describe_engine_default_parameters
- [ ] describe_events
- [ ] describe_global_replication_groups
- [ ] describe_replication_groups
- [ ] describe_reserved_cache_nodes
- [ ] describe_reserved_cache_nodes_offerings
- [ ] describe_serverless_cache_snapshots
- [ ] describe_serverless_caches
- [ ] describe_service_updates
- [ ] describe_snapshots
- [ ] describe_update_actions
- [ ] describe_user_groups
- [X] describe_users

  Only the *user_id* parameter is currently supported. Pagination is not yet implemented.
- [ ] disassociate_global_replication_group
- [ ] export_serverless_cache_snapshot
- [ ] failover_global_replication_group
- [ ] increase_node_groups_in_global_replication_group
- [ ] increase_replica_count
- [ ] list_allowed_node_type_modifications
- [X] list_tags_for_resource
- [ ] modify_cache_cluster
- [ ] modify_cache_parameter_group
- [ ] modify_cache_subnet_group
- [ ] modify_global_replication_group
- [ ] modify_replication_group
- [ ] modify_replication_group_shard_configuration

- [ ] modify_serverless_cache
- [ ] modify_user
- [ ] modify_user_group
- [ ] purchase_reserved_cache_nodes_offering
- [ ] rebalance_slots_in_global_replication_group
- [ ] reboot_cache_cluster
- [ ] remove_tags_from_resource
- [ ] reset_cache_parameter_group
- [ ] revoke_cache_security_group_ingress
- [ ] start_migration
- [ ] test_failover
- [ ] test_migration

### 2.10.44 elasticbeanstalk

Implemented features for this service

- [ ] abort_environment_update
- [ ] apply_environment_managed_action
- [ ] associate_environment_operations_role
- [ ] check_dns_availability
- [ ] compose_environments
- [X] create_application
- [ ] create_application_version
- [ ] create_configuration_template
- [X] create_environment
- [ ] create_platform_version
- [ ] create_storage_location
- [X] delete_application
- [ ] delete_application_version
- [ ] delete_configuration_template
- [ ] delete_environment_configuration
- [ ] delete_platform_version
- [ ] describe_account_attributes
- [ ] describe_application_versions
- [ ] describe_applications
- [ ] describe_configuration_options
- [ ] describe_configuration_settings

- [ ] describe_environment_health
- [ ] describe_environment_managed_action_history
- [ ] describe_environment_managed_actions
- [ ] describe_environment_resources
- [X] describe_environments
- [ ] describe_events
- [ ] describe_instances_health
- [ ] describe_platform_version
- [ ] disassociate_environment_operations_role
- [X] list_available_solution_stacks
- [ ] list_platform_branches
- [ ] list_platform_versions
- [X] list_tags_for_resource
- [ ] rebuild_environment
- [ ] request_environment_info
- [ ] restart_app_server
- [ ] retrieve_environment_info
- [ ] swap_environment_cnames
- [ ] terminate_environment
- [ ] update_application
- [ ] update_application_resource_lifecycle
- [ ] update_application_version
- [ ] update_configuration_template
- [ ] update_environment
- [X] update_tags_for_resource
- [ ] validate_configuration_settings

### 2.10.45 elastictranscoder

Implemented features for this service

- [ ] cancel_job
- [ ] create_job
- [X] create_pipeline

  The following parameters are not yet implemented: AWSKMSKeyArn, Notifications
- [ ] create_preset
- [X] delete_pipeline
- [ ] delete_preset

- [ ] list_jobs_by_pipeline
- [ ] list_jobs_by_status
- [X] list_pipelines
- [ ] list_presets
- [ ] read_job
- [X] read_pipeline
- [ ] read_preset
- [ ] test_role
- [X] update_pipeline

  The following parameters are not yet implemented: AWSKMSKeyArn, Notifications, ContentConfig, ThumbnailConfig
- [ ] update_pipeline_notifications
- [ ] update_pipeline_status

### 2.10.46 elb

Implemented features for this service

- [ ] add_tags
- [X] apply_security_groups_to_load_balancer
- [X] attach_load_balancer_to_subnets
- [X] configure_health_check
- [X] create_app_cookie_stickiness_policy
- [X] create_lb_cookie_stickiness_policy
- [X] create_load_balancer
- [X] create_load_balancer_listeners
- [X] create_load_balancer_policy
- [X] delete_load_balancer
- [X] delete_load_balancer_listeners
- [X] delete_load_balancer_policy
- [ ] deregister_instances_from_load_balancer
- [ ] describe_account_limits
- [X] describe_instance_health
- [ ] describe_load_balancer_attributes
- [X] describe_load_balancer_policies
- [ ] describe_load_balancer_policy_types
- [X] describe_load_balancers
- [ ] describe_tags

- [X] detach_load_balancer_from_subnets
- [X] disable_availability_zones_for_load_balancer
- [X] enable_availability_zones_for_load_balancer
- [X] modify_load_balancer_attributes
- [ ] register_instances_with_load_balancer
- [ ] remove_tags
- [X] set_load_balancer_listener_ssl_certificate
- [X] set_load_balancer_policies_for_backend_server
- [X] set_load_balancer_policies_of_listener

### 2.10.47 elbv2

Implemented features for this service

- [X] add_listener_certificates
- [X] add_tags
- [ ] add_trust_store_revocations
- [X] create_listener
- [X] create_load_balancer
- [X] create_rule
- [X] create_target_group
- [ ] create_trust_store
- [X] delete_listener
- [X] delete_load_balancer
- [X] delete_rule
- [X] delete_target_group
- [ ] delete_trust_store
- [X] deregister_targets
- [ ] describe_account_limits
- [X] describe_listener_certificates
- [X] describe_listeners
- [X] describe_load_balancer_attributes
- [X] describe_load_balancers
- [X] describe_rules
- [ ] describe_ssl_policies
- [X] describe_tags
- [ ] describe_target_group_attributes
- [X] describe_target_groups

- [X] describe_target_health
- [ ] describe_trust_store_associations
- [ ] describe_trust_store_revocations
- [ ] describe_trust_stores
- [ ] get_trust_store_ca_certificates_bundle
- [ ] get_trust_store_revocation_content
- [X] modify_listener
- [X] modify_load_balancer_attributes
- [X] modify_rule
- [X] modify_target_group
- [X] modify_target_group_attributes
- [ ] modify_trust_store
- [X] register_targets
- [X] remove_listener_certificates
- [X] remove_tags
- [ ] remove_trust_store_revocations
- [X] set_ip_address_type
- [X] set_rule_priorities
- [X] set_security_groups
- [X] set_subnets

### 2.10.48 emr

Implemented features for this service

- [ ] add_instance_fleet
- [X] add_instance_groups
- [X] add_job_flow_steps
- [X] add_tags
- [ ] cancel_steps
- [X] create_security_configuration
- [ ] create_studio
- [ ] create_studio_session_mapping
- [X] delete_security_configuration
- [ ] delete_studio
- [ ] delete_studio_session_mapping
- [X] describe_cluster
- [X] describe_job_flows

- [ ] describe_notebook_execution
- [ ] describe_release_label
- [ ] describe_security_configuration
- [X] describe_step
- [ ] describe_studio
- [ ] get_auto_termination_policy
- [ ] get_block_public_access_configuration
- [ ] get_cluster_session_credentials
- [ ] get_managed_scaling_policy
- [ ] get_studio_session_mapping
- [X] list_bootstrap_actions
- [X] list_clusters
- [ ] list_instance_fleets
- [X] list_instance_groups
- [X] list_instances
- [ ] list_notebook_executions
- [ ] list_release_labels
- [ ] list_security_configurations
- [X] list_steps
- [ ] list_studio_session_mappings
- [ ] list_studios
- [ ] list_supported_instance_types
- [X] modify_cluster
- [ ] modify_instance_fleet
- [X] modify_instance_groups
- [X] put_auto_scaling_policy
- [ ] put_auto_termination_policy
- [ ] put_block_public_access_configuration
- [ ] put_managed_scaling_policy
- [X] remove_auto_scaling_policy
- [ ] remove_auto_termination_policy
- [ ] remove_managed_scaling_policy
- [X] remove_tags
- [X] run_job_flow
- [ ] set_keep_job_flow_alive_when_no_steps
- [X] set_termination_protection

- [ ] set_unhealthy_node_replacement
- [X] set_visible_to_all_users
- [ ] start_notebook_execution
- [ ] stop_notebook_execution
- [X] terminate_job_flows
- [ ] update_studio
- [ ] update_studio_session_mapping

### 2.10.49 emr-containers

**class** moto.emrcontainers.models.**EMRContainersBackend**(*region_name: str*, *account_id: str*)

Implementation of EMRContainers APIs.

Implemented features for this service

- [X] cancel_job_run
- [ ] create_job_template
- [ ] create_managed_endpoint
- [X] create_virtual_cluster
- [ ] delete_job_template
- [ ] delete_managed_endpoint
- [X] delete_virtual_cluster
- [X] describe_job_run
- [ ] describe_job_template
- [ ] describe_managed_endpoint
- [X] describe_virtual_cluster
- [ ] get_managed_endpoint_session_credentials
- [X] list_job_runs
- [ ] list_job_templates
- [ ] list_managed_endpoints
- [ ] list_tags_for_resource
- [X] list_virtual_clusters
- [X] start_job_run
- [ ] tag_resource
- [ ] untag_resource

### 2.10.50 emr-serverless

**class** moto.emrserverless.models.**EMRServerlessBackend**(*region_name: str*, *account_id: str*)

Implementation of EMRServerless APIs.

Implemented features for this service

- [ ] cancel_job_run
- [X] create_application
- [X] delete_application
- [X] get_application
- [ ] get_dashboard_for_job_run
- [ ] get_job_run
- [X] list_applications
- [ ] list_job_runs
- [ ] list_tags_for_resource
- [X] start_application
- [ ] start_job_run
- [X] stop_application
- [ ] tag_resource
- [ ] untag_resource
- [X] update_application

### 2.10.51 es

**class** moto.es.models.**ElasticsearchServiceBackend**(*region_name: str*, *account_id: str*)

Implementation of ElasticsearchService APIs.

Implemented features for this service

- [ ] accept_inbound_cross_cluster_search_connection
- [ ] add_tags
- [ ] associate_package
- [ ] authorize_vpc_endpoint_access
- [ ] cancel_domain_config_change
- [ ] cancel_elasticsearch_service_software_update
- [X] create_elasticsearch_domain
- [ ] create_outbound_cross_cluster_search_connection
- [ ] create_package
- [ ] create_vpc_endpoint
- [X] delete_elasticsearch_domain
- [ ] delete_elasticsearch_service_role

- [ ] delete_inbound_cross_cluster_search_connection
- [ ] delete_outbound_cross_cluster_search_connection
- [ ] delete_package
- [ ] delete_vpc_endpoint
- [ ] describe_domain_auto_tunes
- [ ] describe_domain_change_progress
- [X] describe_elasticsearch_domain
- [ ] describe_elasticsearch_domain_config
- [ ] describe_elasticsearch_domains
- [ ] describe_elasticsearch_instance_type_limits
- [ ] describe_inbound_cross_cluster_search_connections
- [ ] describe_outbound_cross_cluster_search_connections
- [ ] describe_packages
- [ ] describe_reserved_elasticsearch_instance_offerings
- [ ] describe_reserved_elasticsearch_instances
- [ ] describe_vpc_endpoints
- [ ] dissociate_package
- [ ] get_compatible_elasticsearch_versions
- [ ] get_package_version_history
- [ ] get_upgrade_history
- [ ] get_upgrade_status
- [X] list_domain_names

  The engine-type parameter is not yet supported. Pagination is not yet implemented.
- [ ] list_domains_for_package
- [ ] list_elasticsearch_instance_types
- [ ] list_elasticsearch_versions
- [ ] list_packages_for_domain
- [ ] list_tags
- [ ] list_vpc_endpoint_access
- [ ] list_vpc_endpoints
- [ ] list_vpc_endpoints_for_domain
- [ ] purchase_reserved_elasticsearch_instance_offering
- [ ] reject_inbound_cross_cluster_search_connection
- [ ] remove_tags
- [ ] revoke_vpc_endpoint_access
- [ ] start_elasticsearch_service_software_update

- [ ] update_elasticsearch_domain_config
- [ ] update_package
- [ ] update_vpc_endpoint
- [ ] upgrade_elasticsearch_domain

### 2.10.52 events

**class** moto.events.models.**EventsBackend**(*region_name: str*, *account_id: str*)

Some Moto services are configured to generate events and send them to EventBridge. See the AWS documentation here: https://docs.aws.amazon.com/eventbridge/latest/userguide/eb-service-event.html

Events that currently supported

- S3:CreateBucket

Targets that are currently supported

- AWSLambda functions

Please let us know if you want support for an event/target that is not yet listed here.

Implemented features for this service

- [ ] activate_event_source
- [X] cancel_replay
- [X] create_api_destination
- [X] create_archive
- [X] create_connection
- [ ] create_endpoint
- [X] create_event_bus
- [X] create_partner_event_source
- [ ] deactivate_event_source
- [ ] deauthorize_connection
- [X] delete_api_destination
- [X] delete_archive
- [X] delete_connection
- [ ] delete_endpoint
- [X] delete_event_bus
- [X] delete_partner_event_source
- [X] delete_rule
- [X] describe_api_destination
- [X] describe_archive
- [X] describe_connection
- [ ] describe_endpoint

- [X] describe_event_bus
- [X] describe_event_source
- [X] describe_partner_event_source
- [X] describe_replay
- [X] describe_rule
- [X] disable_rule
- [X] enable_rule
- [X] list_api_destinations
- [X] list_archives
- [X] list_connections
- [ ] list_endpoints
- [X] list_event_buses
- [ ] list_event_sources
- [ ] list_partner_event_source_accounts
- [ ] list_partner_event_sources
- [X] list_replays
- [X] list_rule_names_by_target
- [X] list_rules
- [X] list_tags_for_resource
- [X] list_targets_by_rule
- [X] put_events

  The following targets are supported at the moment:

  - CloudWatch Log Group
  - EventBridge Archive
  - SQS Queue + FIFO Queue
  - Cross-region/account EventBus
  - HTTP requests (only enabled when MOTO_EVENTS_INVOKE_HTTP=true)
- [X] put_partner_events

  Validation of the entries is not yet implemented.
- [X] put_permission
- [X] put_rule
- [X] put_targets
- [X] remove_permission
- [X] remove_targets
- [X] start_replay
- [X] tag_resource

- [X] test_event_pattern
- [X] untag_resource
- [X] update_api_destination
- [X] update_archive
- [X] update_connection
- [ ] update_endpoint

### 2.10.53 firehose

**class** moto.firehose.models.**FirehoseBackend**(*region_name: str*, *account_id: str*)

Implementation of Firehose APIs.

Implemented features for this service

- [X] create_delivery_stream Create a Kinesis Data Firehose delivery stream.
- [X] delete_delivery_stream Delete a delivery stream and its data.

  AllowForceDelete option is ignored as we only superficially apply state.
- [X] describe_delivery_stream Return description of specified delivery stream and its status.

  Note: the 'limit' and 'exclusive_start_destination_id' parameters are not currently processed/implemented.
- [X] list_delivery_streams Return list of delivery streams in alphabetic order of names.
- [X] list_tags_for_delivery_stream Return list of tags.
- [X] put_record Write a single data record into a Kinesis Data firehose stream.
- [X] put_record_batch Write multiple data records into a Kinesis Data firehose stream.
- [X] start_delivery_stream_encryption
- [X] stop_delivery_stream_encryption
- [X] tag_delivery_stream Add/update tags for specified delivery stream.
- [X] untag_delivery_stream Removes tags from specified delivery stream.
- [X] update_destination

### 2.10.54 forecast

Implemented features for this service

- [ ] create_auto_predictor
- [ ] create_dataset
- [X] create_dataset_group
- [ ] create_dataset_import_job
- [ ] create_explainability
- [ ] create_explainability_export
- [ ] create_forecast

- [ ] create_forecast_export_job
- [ ] create_monitor
- [ ] create_predictor
- [ ] create_predictor_backtest_export_job
- [ ] create_what_if_analysis
- [ ] create_what_if_forecast
- [ ] create_what_if_forecast_export
- [ ] delete_dataset
- [X] delete_dataset_group
- [ ] delete_dataset_import_job
- [ ] delete_explainability
- [ ] delete_explainability_export
- [ ] delete_forecast
- [ ] delete_forecast_export_job
- [ ] delete_monitor
- [ ] delete_predictor
- [ ] delete_predictor_backtest_export_job
- [ ] delete_resource_tree
- [ ] delete_what_if_analysis
- [ ] delete_what_if_forecast
- [ ] delete_what_if_forecast_export
- [ ] describe_auto_predictor
- [ ] describe_dataset
- [X] describe_dataset_group
- [ ] describe_dataset_import_job
- [ ] describe_explainability
- [ ] describe_explainability_export
- [ ] describe_forecast
- [ ] describe_forecast_export_job
- [ ] describe_monitor
- [ ] describe_predictor
- [ ] describe_predictor_backtest_export_job
- [ ] describe_what_if_analysis
- [ ] describe_what_if_forecast
- [ ] describe_what_if_forecast_export
- [ ] get_accuracy_metrics

- [X] list_dataset_groups
- [ ] list_dataset_import_jobs
- [ ] list_datasets
- [ ] list_explainabilities
- [ ] list_explainability_exports
- [ ] list_forecast_export_jobs
- [ ] list_forecasts
- [ ] list_monitor_evaluations
- [ ] list_monitors
- [ ] list_predictor_backtest_export_jobs
- [ ] list_predictors
- [ ] list_tags_for_resource
- [ ] list_what_if_analyses
- [ ] list_what_if_forecast_exports
- [ ] list_what_if_forecasts
- [ ] resume_resource
- [ ] stop_resource
- [ ] tag_resource
- [ ] untag_resource
- [X] update_dataset_group

### 2.10.55 glacier

Implemented features for this service

- [ ] abort_multipart_upload
- [ ] abort_vault_lock
- [ ] add_tags_to_vault
- [ ] complete_multipart_upload
- [ ] complete_vault_lock
- [X] create_vault
- [ ] delete_archive
- [X] delete_vault
- [ ] delete_vault_access_policy
- [ ] delete_vault_notifications
- [X] describe_job
- [ ] describe_vault
- [ ] get_data_retrieval_policy

- [X] get_job_output
- [ ] get_vault_access_policy
- [ ] get_vault_lock
- [ ] get_vault_notifications
- [X] initiate_job
- [ ] initiate_multipart_upload
- [ ] initiate_vault_lock
- [X] list_jobs
- [ ] list_multipart_uploads
- [ ] list_parts
- [ ] list_provisioned_capacity
- [ ] list_tags_for_vault
- [X] list_vaults
- [ ] purchase_provisioned_capacity
- [ ] remove_tags_from_vault
- [ ] set_data_retrieval_policy
- [ ] set_vault_access_policy
- [ ] set_vault_notifications
- [X] upload_archive
- [ ] upload_multipart_part

### 2.10.56 glue

Implemented features for this service

- [X] batch_create_partition
- [ ] batch_delete_connection
- [X] batch_delete_partition
- [X] batch_delete_table
- [ ] batch_delete_table_version
- [ ] batch_get_blueprints
- [X] batch_get_crawlers
- [ ] batch_get_custom_entity_types
- [ ] batch_get_data_quality_result
- [ ] batch_get_dev_endpoints
- [X] batch_get_jobs
- [X] batch_get_partition
- [ ] batch_get_table_optimizer

- [X] batch_get_triggers
- [ ] batch_get_workflows
- [ ] batch_stop_job_run
- [X] batch_update_partition
- [ ] cancel_data_quality_rule_recommendation_run
- [ ] cancel_data_quality_ruleset_evaluation_run
- [ ] cancel_ml_task_run
- [ ] cancel_statement
- [ ] check_schema_version_validity
- [ ] create_blueprint
- [ ] create_classifier
- [ ] create_connection
- [X] create_crawler
- [ ] create_custom_entity_type
- [ ] create_data_quality_ruleset
- [X] create_database
- [ ] create_dev_endpoint
- [X] create_job
- [ ] create_ml_transform
- [X] create_partition
- [ ] create_partition_index
- [X] create_registry
- [X] create_schema

  The following parameters/features are not yet implemented: Glue Schema Registry: compatibility checks NONE | BACKWARD | BACKWARD_ALL | FORWARD | FORWARD_ALL | FULL | FULL_ALL and Data format parsing and syntax validation.
- [ ] create_script
- [ ] create_security_configuration
- [X] create_session
- [X] create_table
- [ ] create_table_optimizer
- [X] create_trigger
- [ ] create_user_defined_function
- [ ] create_workflow
- [ ] delete_blueprint
- [ ] delete_classifier
- [ ] delete_column_statistics_for_partition

- [ ] delete_column_statistics_for_table
- [ ] delete_connection
- [X] delete_crawler
- [ ] delete_custom_entity_type
- [ ] delete_data_quality_ruleset
- [X] delete_database
- [ ] delete_dev_endpoint
- [X] delete_job
- [ ] delete_ml_transform
- [X] delete_partition
- [ ] delete_partition_index
- [X] delete_registry
- [ ] delete_resource_policy
- [X] delete_schema
- [ ] delete_schema_versions
- [ ] delete_security_configuration
- [X] delete_session
- [X] delete_table
- [ ] delete_table_optimizer
- [X] delete_table_version
- [X] delete_trigger
- [ ] delete_user_defined_function
- [ ] delete_workflow
- [ ] get_blueprint
- [ ] get_blueprint_run
- [ ] get_blueprint_runs
- [ ] get_catalog_import_status
- [ ] get_classifier
- [ ] get_classifiers
- [ ] get_column_statistics_for_partition
- [ ] get_column_statistics_for_table
- [ ] get_column_statistics_task_run
- [ ] get_column_statistics_task_runs
- [ ] get_connection
- [ ] get_connections
- [X] get_crawler

- [ ] get_crawler_metrics
- [X] get_crawlers
- [ ] get_custom_entity_type
- [ ] get_data_catalog_encryption_settings
- [ ] get_data_quality_result
- [ ] get_data_quality_rule_recommendation_run
- [ ] get_data_quality_ruleset
- [ ] get_data_quality_ruleset_evaluation_run
- [X] get_database
- [X] get_databases
- [ ] get_dataflow_graph
- [ ] get_dev_endpoint
- [ ] get_dev_endpoints
- [X] get_job
- [ ] get_job_bookmark
- [X] get_job_run
- [ ] get_job_runs
- [X] get_jobs
- [ ] get_mapping
- [ ] get_ml_task_run
- [ ] get_ml_task_runs
- [ ] get_ml_transform
- [ ] get_ml_transforms
- [X] get_partition
- [ ] get_partition_indexes
- [X] get_partitions

  See https://docs.aws.amazon.com/glue/latest/webapi/API_GetPartitions.html for supported expressions.

  Expression caveats:

  - Column names must consist of UPPERCASE, lowercase, dots and underscores only.
  - Literal dates and timestamps must be valid, i.e. no support for February 31st.
  - LIKE expressions are converted to Python regexes, escaping special characters. Only % and _ wildcards are supported, and SQL escaping using [] does not work.
- [ ] get_plan
- [X] get_registry
- [ ] get_resource_policies
- [ ] get_resource_policy

- [X] get_schema
- [X] get_schema_by_definition
- [X] get_schema_version
- [ ] get_schema_versions_diff
- [ ] get_security_configuration
- [ ] get_security_configurations
- [X] get_session
- [ ] get_statement
- [X] get_table
- [ ] get_table_optimizer
- [X] get_table_version
- [X] get_table_versions
- [X] get_tables
- [X] get_tags
- [X] get_trigger
- [X] get_triggers
- [ ] get_unfiltered_partition_metadata
- [ ] get_unfiltered_partitions_metadata
- [ ] get_unfiltered_table_metadata
- [ ] get_user_defined_function
- [ ] get_user_defined_functions
- [ ] get_workflow
- [ ] get_workflow_run
- [ ] get_workflow_run_properties
- [ ] get_workflow_runs
- [ ] import_catalog_to_glue
- [ ] list_blueprints
- [ ] list_column_statistics_task_runs
- [X] list_crawlers
- [ ] list_crawls
- [ ] list_custom_entity_types
- [ ] list_data_quality_results
- [ ] list_data_quality_rule_recommendation_runs
- [ ] list_data_quality_ruleset_evaluation_runs
- [ ] list_data_quality_rulesets
- [ ] list_dev_endpoints

- [X] list_jobs
- [ ] list_ml_transforms
- [X] list_registries
- [ ] list_schema_versions
- [ ] list_schemas
- [X] list_sessions
- [ ] list_statements
- [ ] list_table_optimizer_runs
- [X] list_triggers
- [ ] list_workflows
- [ ] put_data_catalog_encryption_settings
- [ ] put_resource_policy
- [X] put_schema_version_metadata
- [ ] put_workflow_run_properties
- [ ] query_schema_version_metadata
- [X] register_schema_version
- [ ] remove_schema_version_metadata
- [ ] reset_job_bookmark
- [ ] resume_workflow_run
- [ ] run_statement
- [ ] search_tables
- [ ] start_blueprint_run
- [ ] start_column_statistics_task_run
- [X] start_crawler
- [ ] start_crawler_schedule
- [ ] start_data_quality_rule_recommendation_run
- [ ] start_data_quality_ruleset_evaluation_run
- [ ] start_export_labels_task_run
- [ ] start_import_labels_task_run
- [X] start_job_run
- [ ] start_ml_evaluation_task_run
- [ ] start_ml_labeling_set_generation_task_run
- [X] start_trigger
- [ ] start_workflow_run
- [ ] stop_column_statistics_task_run
- [X] stop_crawler

- [ ] stop_crawler_schedule
- [X] stop_session
- [X] stop_trigger
- [ ] stop_workflow_run
- [X] tag_resource
- [X] untag_resource
- [ ] update_blueprint
- [ ] update_classifier
- [ ] update_column_statistics_for_partition
- [ ] update_column_statistics_for_table
- [ ] update_connection
- [ ] update_crawler
- [ ] update_crawler_schedule
- [ ] update_data_quality_ruleset
- [X] update_database
- [ ] update_dev_endpoint
- [ ] update_job
- [ ] update_job_from_source_control
- [ ] update_ml_transform
- [X] update_partition
- [ ] update_registry
- [X] update_schema

  The SchemaVersionNumber-argument is not yet implemented
- [ ] update_source_control_from_job
- [X] update_table
- [ ] update_table_optimizer
- [ ] update_trigger
- [ ] update_user_defined_function
- [ ] update_workflow

### 2.10.57 greengrass

Implemented features for this service

- [X] associate_role_to_group
- [ ] associate_service_role_to_account
- [ ] create_connector_definition
- [ ] create_connector_definition_version
- [X] create_core_definition
- [X] create_core_definition_version
- [X] create_deployment
- [X] create_device_definition
- [X] create_device_definition_version
- [X] create_function_definition
- [X] create_function_definition_version
- [X] create_group
- [ ] create_group_certificate_authority
- [X] create_group_version
- [ ] create_logger_definition
- [ ] create_logger_definition_version
- [X] create_resource_definition
- [X] create_resource_definition_version
- [ ] create_software_update_job
- [X] create_subscription_definition
- [X] create_subscription_definition_version
- [ ] delete_connector_definition
- [X] delete_core_definition
- [X] delete_device_definition
- [X] delete_function_definition
- [X] delete_group
- [ ] delete_logger_definition
- [X] delete_resource_definition
- [X] delete_subscription_definition
- [X] disassociate_role_from_group
- [ ] disassociate_service_role_from_account
- [X] get_associated_role
- [ ] get_bulk_deployment_status
- [ ] get_connectivity_info

- [ ] get_connector_definition
- [ ] get_connector_definition_version
- [X] get_core_definition
- [X] get_core_definition_version
- [X] get_deployment_status
- [X] get_device_definition
- [X] get_device_definition_version
- [X] get_function_definition
- [X] get_function_definition_version
- [X] get_group
- [ ] get_group_certificate_authority
- [ ] get_group_certificate_configuration
- [X] get_group_version
- [ ] get_logger_definition
- [ ] get_logger_definition_version
- [X] get_resource_definition
- [X] get_resource_definition_version
- [ ] get_service_role_for_account
- [X] get_subscription_definition
- [X] get_subscription_definition_version
- [ ] get_thing_runtime_configuration
- [ ] list_bulk_deployment_detailed_reports
- [ ] list_bulk_deployments
- [ ] list_connector_definition_versions
- [ ] list_connector_definitions
- [X] list_core_definition_versions
- [X] list_core_definitions
- [X] list_deployments
- [X] list_device_definition_versions
- [X] list_device_definitions
- [X] list_function_definition_versions
- [X] list_function_definitions
- [ ] list_group_certificate_authorities
- [X] list_group_versions
- [X] list_groups
- [ ] list_logger_definition_versions

- [ ] list_logger_definitions
- [X] list_resource_definition_versions
- [X] list_resource_definitions
- [X] list_subscription_definition_versions
- [X] list_subscription_definitions
- [ ] list_tags_for_resource
- [X] reset_deployments
- [ ] start_bulk_deployment
- [ ] stop_bulk_deployment
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_connectivity_info
- [ ] update_connector_definition
- [X] update_core_definition
- [X] update_device_definition
- [X] update_function_definition
- [X] update_group
- [ ] update_group_certificate_configuration
- [ ] update_logger_definition
- [X] update_resource_definition
- [X] update_subscription_definition
- [ ] update_thing_runtime_configuration

### 2.10.58 guardduty

Implemented features for this service

- [ ] accept_administrator_invitation
- [ ] accept_invitation
- [ ] archive_findings
- [X] create_detector
- [X] create_filter
- [ ] create_ip_set
- [ ] create_members
- [ ] create_publishing_destination
- [ ] create_sample_findings
- [ ] create_threat_intel_set
- [ ] decline_invitations

- [X] delete_detector
- [X] delete_filter
- [ ] delete_invitations
- [ ] delete_ip_set
- [ ] delete_members
- [ ] delete_publishing_destination
- [ ] delete_threat_intel_set
- [ ] describe_malware_scans
- [ ] describe_organization_configuration
- [ ] describe_publishing_destination
- [ ] disable_organization_admin_account
- [ ] disassociate_from_administrator_account
- [ ] disassociate_from_master_account
- [ ] disassociate_members
- [X] enable_organization_admin_account
- [ ] get_administrator_account
- [ ] get_coverage_statistics
- [X] get_detector
- [X] get_filter
- [ ] get_findings
- [ ] get_findings_statistics
- [ ] get_invitations_count
- [ ] get_ip_set
- [ ] get_malware_scan_settings
- [ ] get_master_account
- [ ] get_member_detectors
- [ ] get_members
- [ ] get_organization_statistics
- [ ] get_remaining_free_trial_days
- [ ] get_threat_intel_set
- [ ] get_usage_statistics
- [ ] invite_members
- [ ] list_coverage
- [X] list_detectors

  The MaxResults and NextToken-parameter have not yet been implemented.
- [ ] list_filters

- [ ] list_findings
- [ ] list_invitations
- [ ] list_ip_sets
- [ ] list_members
- [X] list_organization_admin_accounts

  Pagination is not yet implemented
- [ ] list_publishing_destinations
- [ ] list_tags_for_resource
- [ ] list_threat_intel_sets
- [ ] start_malware_scan
- [ ] start_monitoring_members
- [ ] stop_monitoring_members
- [ ] tag_resource
- [ ] unarchive_findings
- [ ] untag_resource
- [X] update_detector
- [X] update_filter
- [ ] update_findings_feedback
- [ ] update_ip_set
- [ ] update_malware_scan_settings
- [ ] update_member_detectors
- [ ] update_organization_configuration
- [ ] update_publishing_destination
- [ ] update_threat_intel_set

### 2.10.59 iam

Implemented features for this service

- [ ] add_client_id_to_open_id_connect_provider
- [X] add_role_to_instance_profile
- [X] add_user_to_group
- [X] attach_group_policy
- [X] attach_role_policy
- [X] attach_user_policy
- [ ] change_password
- [X] create_access_key
- [X] create_account_alias

- [X] create_group
- [X] create_instance_profile
- [X] create_login_profile
- [X] create_open_id_connect_provider
- [X] create_policy
- [X] create_policy_version
- [X] create_role
- [X] create_saml_provider
- [X] create_service_linked_role
- [ ] create_service_specific_credential
- [X] create_user
- [X] create_virtual_mfa_device
- [X] deactivate_mfa_device Deactivate and detach MFA Device from user if device exists.
- [X] delete_access_key
- [X] delete_account_alias
- [X] delete_account_password_policy
- [X] delete_group
- [X] delete_group_policy
- [X] delete_instance_profile
- [X] delete_login_profile
- [X] delete_open_id_connect_provider
- [X] delete_policy
- [X] delete_policy_version
- [X] delete_role
- [X] delete_role_permissions_boundary
- [X] delete_role_policy
- [X] delete_saml_provider
- [X] delete_server_certificate
- [X] delete_service_linked_role
- [ ] delete_service_specific_credential
- [X] delete_signing_certificate
- [X] delete_ssh_public_key
- [X] delete_user
- [ ] delete_user_permissions_boundary
- [X] delete_user_policy
- [X] delete_virtual_mfa_device

- [X] detach_group_policy
- [X] detach_role_policy
- [X] detach_user_policy
- [X] enable_mfa_device Enable MFA Device for user.
- [ ] generate_credential_report
- [ ] generate_organizations_access_report
- [ ] generate_service_last_accessed_details
- [X] get_access_key_last_used
- [X] get_account_authorization_details
- [X] get_account_password_policy
- [X] get_account_summary
- [ ] get_context_keys_for_custom_policy
- [ ] get_context_keys_for_principal_policy
- [X] get_credential_report
- [X] get_group

  Pagination is not yet implemented
- [X] get_group_policy
- [X] get_instance_profile
- [X] get_login_profile
- [ ] get_mfa_device
- [X] get_open_id_connect_provider
- [ ] get_organizations_access_report
- [X] get_policy
- [X] get_policy_version
- [X] get_role
- [X] get_role_policy
- [X] get_saml_provider
- [X] get_server_certificate
- [ ] get_service_last_accessed_details
- [ ] get_service_last_accessed_details_with_entities
- [X] get_service_linked_role_deletion_status

  This method always succeeds for now - we do not yet keep track of deletions
- [X] get_ssh_public_key
- [X] get_user
- [X] get_user_policy
- [X] list_access_keys

Pagination is not yet implemented

- [X] list_account_aliases
- [X] list_attached_group_policies
- [X] list_attached_role_policies
- [X] list_attached_user_policies
- [ ] list_entities_for_policy
- [X] list_group_policies

  Pagination is not yet implemented
- [X] list_groups
- [ ] list_groups_for_user
- [ ] list_instance_profile_tags
- [ ] list_instance_profiles
- [ ] list_instance_profiles_for_role
- [ ] list_mfa_device_tags
- [X] list_mfa_devices
- [X] list_open_id_connect_provider_tags
- [X] list_open_id_connect_providers
- [X] list_policies
- [ ] list_policies_granting_service_access
- [X] list_policy_tags
- [X] list_policy_versions
- [X] list_role_policies
- [X] list_role_tags
- [X] list_roles
- [ ] list_saml_provider_tags
- [X] list_saml_providers
- [ ] list_server_certificate_tags
- [X] list_server_certificates

  Pagination is not yet implemented
- [ ] list_service_specific_credentials
- [X] list_signing_certificates
- [ ] list_ssh_public_keys
- [X] list_user_policies
- [X] list_user_tags
- [X] list_users
- [X] list_virtual_mfa_devices

- [X] put_group_policy
- [X] put_role_permissions_boundary
- [X] put_role_policy
- [ ] put_user_permissions_boundary
- [X] put_user_policy
- [ ] remove_client_id_from_open_id_connect_provider
- [X] remove_role_from_instance_profile
- [X] remove_user_from_group
- [ ] reset_service_specific_credential
- [ ] resync_mfa_device
- [X] set_default_policy_version
- [ ] set_security_token_service_preferences
- [ ] simulate_custom_policy
- [ ] simulate_principal_policy
- [ ] tag_instance_profile
- [ ] tag_mfa_device
- [X] tag_open_id_connect_provider
- [X] tag_policy
- [X] tag_role
- [ ] tag_saml_provider
- [ ] tag_server_certificate
- [X] tag_user
- [ ] untag_instance_profile
- [ ] untag_mfa_device
- [X] untag_open_id_connect_provider
- [X] untag_policy
- [X] untag_role
- [ ] untag_saml_provider
- [ ] untag_server_certificate
- [X] untag_user
- [X] update_access_key
- [X] update_account_password_policy
- [X] update_assume_role_policy
- [X] update_group
- [X] update_login_profile
- [X] update_open_id_connect_provider_thumbprint

- [X] update_role
- [X] update_role_description
- [X] update_saml_provider
- [ ] update_server_certificate
- [ ] update_service_specific_credential
- [X] update_signing_certificate
- [X] update_ssh_public_key
- [X] update_user
- [X] upload_server_certificate
- [X] upload_signing_certificate
- [X] upload_ssh_public_key

### 2.10.60 identitystore

**class** moto.identitystore.models.**IdentityStoreBackend**(*region_name: str*, *account_id: str*)

Implementation of IdentityStore APIs.

Implemented features for this service

- [X] create_group
- [X] create_group_membership
- [X] create_user
- [X] delete_group
- [X] delete_group_membership
- [X] delete_user
- [X] describe_group
- [ ] describe_group_membership
- [X] describe_user
- [X] get_group_id

  The ExternalId alternate identifier is not yet implemented
- [ ] get_group_membership_id
- [ ] get_user_id
- [ ] is_member_in_groups
- [X] list_group_memberships
- [X] list_group_memberships_for_member
- [X] list_groups
- [X] list_users
- [ ] update_group
- [ ] update_user

### 2.10.61 inspector2

Implemented features for this service

- [X] associate_member
- [X] batch_get_account_status
- [ ] batch_get_code_snippet
- [ ] batch_get_finding_details
- [ ] batch_get_free_trial_info
- [ ] batch_get_member_ec2_deep_inspection_status
- [ ] batch_update_member_ec2_deep_inspection_status
- [ ] cancel_findings_report
- [ ] cancel_sbom_export
- [ ] create_cis_scan_configuration
- [X] create_filter
- [ ] create_findings_report
- [ ] create_sbom_export
- [ ] delete_cis_scan_configuration
- [X] delete_filter
- [X] describe_organization_configuration
- [X] disable
- [X] disable_delegated_admin_account
- [X] disassociate_member
- [X] enable
- [X] enable_delegated_admin_account
- [ ] get_cis_scan_report
- [ ] get_cis_scan_result_details
- [ ] get_configuration
- [ ] get_delegated_admin_account
- [ ] get_ec2_deep_inspection_configuration
- [ ] get_encryption_key
- [ ] get_findings_report_status
- [X] get_member
- [ ] get_sbom_export
- [ ] list_account_permissions
- [ ] list_cis_scan_configurations
- [ ] list_cis_scan_results_aggregated_by_checks
- [ ] list_cis_scan_results_aggregated_by_target_resource

- [ ] list_cis_scans
- [ ] list_coverage
- [ ] list_coverage_statistics
- [X] list_delegated_admin_accounts
- [X] list_filters

  Pagination is not yet implemented

- [ ] list_finding_aggregations
- [X] list_findings

  This call will always return 0 findings by default.

  You can use a dedicated API to override this, by configuring a queue of expected results.

  A request to *list_findings* will take the first result from that queue, and assign it to the provided arguments. Subsequent calls using the same arguments will return the same result. Other requests using a different SQL-query will take the next result from the queue, or return an empty result if the queue is empty.

  Configure this queue by making an HTTP request to */moto-api/static/inspector2/findings-results*. An example invocation looks like this:

```
findings = {
    "results": [
        [{
            "awsAccountId": "111122223333",
            "codeVulnerabilityDetails": {"cwes": ["a"], "detectorId": ".."},
        }],
        # .. other findings as required
    ],
    "account_id": "123456789012",  # This is the default - can be omitted
    "region": "us-east-1",  # This is the default - can be omitted
}
resp = requests.post(
    "http://motoapi.amazonaws.com/moto-api/static/inspector2/findings-
↪results",
    json=findings,
)

inspector2 = boto3.client("inspector2", region_name="us-east-1")
findings = inspector2.list_findings()["findings"]
```

- [X] list_members
- [X] list_tags_for_resource
- [ ] list_usage_totals
- [ ] reset_encryption_key
- [ ] search_vulnerabilities
- [ ] send_cis_session_health
- [ ] send_cis_session_telemetry
- [ ] start_cis_session

- [ ] stop_cis_session
- [X] tag_resource
- [X] untag_resource
- [ ] update_cis_scan_configuration
- [ ] update_configuration
- [ ] update_ec2_deep_inspection_configuration
- [ ] update_encryption_key
- [ ] update_filter
- [ ] update_org_ec2_deep_inspection_configuration
- [X] update_organization_configuration

### 2.10.62 iot

Implemented features for this service

- [ ] accept_certificate_transfer
- [ ] add_thing_to_billing_group
- [X] add_thing_to_thing_group
- [ ] associate_targets_with_job
- [X] attach_policy
- [X] attach_principal_policy
- [ ] attach_security_profile
- [X] attach_thing_principal
- [ ] cancel_audit_mitigation_actions_task
- [ ] cancel_audit_task
- [ ] cancel_certificate_transfer
- [ ] cancel_detect_mitigation_actions_task
- [X] cancel_job
- [X] cancel_job_execution

  The parameters ExpectedVersion and StatusDetails are not yet implemented
- [ ] clear_default_authorizer
- [ ] confirm_topic_rule_destination
- [ ] create_audit_suppression
- [ ] create_authorizer
- [ ] create_billing_group
- [X] create_certificate_from_csr
- [ ] create_certificate_provider
- [ ] create_custom_metric

- [ ] create_dimension
- [X] create_domain_configuration

  The ValidationCertificateArn-parameter is not yet implemented
- [ ] create_dynamic_thing_group
- [ ] create_fleet_metric
- [X] create_job
- [ ] create_job_template
- [X] create_keys_and_certificate
- [ ] create_mitigation_action
- [ ] create_ota_update
- [ ] create_package
- [ ] create_package_version
- [X] create_policy
- [X] create_policy_version
- [ ] create_provisioning_claim
- [ ] create_provisioning_template
- [ ] create_provisioning_template_version
- [ ] create_role_alias
- [ ] create_scheduled_audit
- [ ] create_security_profile
- [ ] create_stream
- [X] create_thing
- [X] create_thing_group
- [X] create_thing_type
- [X] create_topic_rule
- [ ] create_topic_rule_destination
- [ ] delete_account_audit_configuration
- [ ] delete_audit_suppression
- [ ] delete_authorizer
- [ ] delete_billing_group
- [X] delete_ca_certificate
- [X] delete_certificate
- [ ] delete_certificate_provider
- [ ] delete_custom_metric
- [ ] delete_dimension
- [X] delete_domain_configuration

- [ ] delete_dynamic_thing_group
- [ ] delete_fleet_metric
- [X] delete_job
- [X] delete_job_execution
- [ ] delete_job_template
- [ ] delete_mitigation_action
- [ ] delete_ota_update
- [ ] delete_package
- [ ] delete_package_version
- [X] delete_policy
- [X] delete_policy_version
- [ ] delete_provisioning_template
- [ ] delete_provisioning_template_version
- [ ] delete_registration_code
- [ ] delete_role_alias
- [ ] delete_scheduled_audit
- [ ] delete_security_profile
- [ ] delete_stream
- [X] delete_thing

  The ExpectedVersion-parameter is not yet implemented
- [X] delete_thing_group

  The ExpectedVersion-parameter is not yet implemented
- [X] delete_thing_type
- [X] delete_topic_rule
- [ ] delete_topic_rule_destination
- [ ] delete_v2_logging_level
- [X] deprecate_thing_type
- [ ] describe_account_audit_configuration
- [ ] describe_audit_finding
- [ ] describe_audit_mitigation_actions_task
- [ ] describe_audit_suppression
- [ ] describe_audit_task
- [ ] describe_authorizer
- [ ] describe_billing_group
- [X] describe_ca_certificate
- [X] describe_certificate

- [ ] describe_certificate_provider
- [ ] describe_custom_metric
- [ ] describe_default_authorizer
- [ ] describe_detect_mitigation_actions_task
- [ ] describe_dimension
- [X] describe_domain_configuration
- [X] describe_endpoint
- [ ] describe_event_configurations
- [ ] describe_fleet_metric
- [ ] describe_index
- [X] describe_job
- [X] describe_job_execution
- [ ] describe_job_template
- [ ] describe_managed_job_template
- [ ] describe_mitigation_action
- [ ] describe_provisioning_template
- [ ] describe_provisioning_template_version
- [ ] describe_role_alias
- [ ] describe_scheduled_audit
- [ ] describe_security_profile
- [ ] describe_stream
- [X] describe_thing
- [X] describe_thing_group
- [ ] describe_thing_registration_task
- [X] describe_thing_type
- [X] detach_policy
- [X] detach_principal_policy
- [ ] detach_security_profile
- [X] detach_thing_principal
- [X] disable_topic_rule
- [X] enable_topic_rule
- [ ] get_behavior_model_training_summaries
- [ ] get_buckets_aggregation
- [ ] get_cardinality
- [ ] get_effective_policies
- [ ] get_indexing_configuration

- [X] get_job_document
- [ ] get_logging_options
- [ ] get_ota_update
- [ ] get_package
- [ ] get_package_configuration
- [ ] get_package_version
- [ ] get_percentiles
- [X] get_policy
- [X] get_policy_version
- [X] get_registration_code
- [ ] get_statistics
- [X] get_topic_rule
- [ ] get_topic_rule_destination
- [ ] get_v2_logging_options
- [ ] list_active_violations
- [X] list_attached_policies

  Pagination is not yet implemented
- [ ] list_audit_findings
- [ ] list_audit_mitigation_actions_executions
- [ ] list_audit_mitigation_actions_tasks
- [ ] list_audit_suppressions
- [ ] list_audit_tasks
- [ ] list_authorizers
- [ ] list_billing_groups
- [ ] list_ca_certificates
- [ ] list_certificate_providers
- [X] list_certificates

  Pagination is not yet implemented
- [X] list_certificates_by_ca

  Pagination is not yet implemented
- [ ] list_custom_metrics
- [ ] list_detect_mitigation_actions_executions
- [ ] list_detect_mitigation_actions_tasks
- [ ] list_dimensions
- [X] list_domain_configurations
- [ ] list_fleet_metrics

- [ ] list_indices
- [X] list_job_executions_for_job
- [X] list_job_executions_for_thing
- [ ] list_job_templates
- [X] list_jobs

  The following parameter are not yet implemented: Status, TargetSelection, ThingGroupName, ThingGroupId
- [ ] list_managed_job_templates
- [ ] list_metric_values
- [ ] list_mitigation_actions
- [ ] list_ota_updates
- [ ] list_outgoing_certificates
- [ ] list_package_versions
- [ ] list_packages
- [X] list_policies

  Pagination is not yet implemented
- [X] list_policy_principals

  Pagination is not yet implemented
- [X] list_policy_versions
- [X] list_principal_policies

  Pagination is not yet implemented
- [X] list_principal_things
- [ ] list_provisioning_template_versions
- [ ] list_provisioning_templates
- [ ] list_related_resources_for_audit_finding
- [ ] list_role_aliases
- [ ] list_scheduled_audits
- [ ] list_security_profiles
- [ ] list_security_profiles_for_target
- [ ] list_streams
- [ ] list_tags_for_resource
- [X] list_targets_for_policy

  Pagination is not yet implemented
- [ ] list_targets_for_security_profile
- [X] list_thing_groups
- [X] list_thing_groups_for_thing

Pagination is not yet implemented

- [X] list_thing_principals
- [ ] list_thing_registration_task_reports
- [ ] list_thing_registration_tasks
- [X] list_thing_types
- [X] list_things
- [ ] list_things_in_billing_group
- [X] list_things_in_thing_group

  Pagination and the recursive-parameter is not yet implemented
- [ ] list_topic_rule_destinations
- [X] list_topic_rules
- [ ] list_v2_logging_levels
- [ ] list_violation_events
- [ ] put_verification_state_on_violation
- [X] register_ca_certificate

  The VerificationCertificate-parameter is not yet implemented
- [X] register_certificate
- [X] register_certificate_without_ca
- [ ] register_thing
- [ ] reject_certificate_transfer
- [ ] remove_thing_from_billing_group
- [X] remove_thing_from_thing_group
- [X] replace_topic_rule
- [X] search_index

  Pagination is not yet implemented. Only basic search queries are supported for now.
- [ ] set_default_authorizer
- [X] set_default_policy_version
- [ ] set_logging_options
- [ ] set_v2_logging_level
- [ ] set_v2_logging_options
- [ ] start_audit_mitigation_actions_task
- [ ] start_detect_mitigation_actions_task
- [ ] start_on_demand_audit_task
- [ ] start_thing_registration_task
- [ ] stop_thing_registration_task
- [ ] tag_resource

- [ ] test_authorization
- [ ] test_invoke_authorizer
- [ ] transfer_certificate
- [ ] untag_resource
- [ ] update_account_audit_configuration
- [ ] update_audit_suppression
- [ ] update_authorizer
- [ ] update_billing_group
- [X] update_ca_certificate

  The newAutoRegistrationStatus and removeAutoRegistration-parameters are not yet implemented
- [X] update_certificate
- [ ] update_certificate_provider
- [ ] update_custom_metric
- [ ] update_dimension
- [X] update_domain_configuration
- [ ] update_dynamic_thing_group
- [ ] update_event_configurations
- [ ] update_fleet_metric
- [ ] update_indexing_configuration
- [ ] update_job
- [ ] update_mitigation_action
- [ ] update_package
- [ ] update_package_configuration
- [ ] update_package_version
- [ ] update_provisioning_template
- [ ] update_role_alias
- [ ] update_scheduled_audit
- [ ] update_security_profile
- [ ] update_stream
- [X] update_thing

  The ExpectedVersion-parameter is not yet implemented
- [X] update_thing_group
- [X] update_thing_groups_for_thing
- [ ] update_topic_rule_destination
- [ ] validate_security_profile_behaviors

### 2.10.63 iot-data

Implemented features for this service

- [X] delete_thing_shadow
- [ ] get_retained_message
- [X] get_thing_shadow
- [X] list_named_shadows_for_thing
- [ ] list_retained_messages
- [X] publish
- [X] update_thing_shadow

  **spec of payload:**

  - need node *state*
  - state node must be an Object
  - State contains an invalid node: 'foo'

### 2.10.64 ivs

**class** moto.ivs.models.**IVSBackend**(*region_name: str*, *account_id: str*)

Implementation of IVS APIs.

Implemented features for this service

- [X] batch_get_channel
- [ ] batch_get_stream_key
- [ ] batch_start_viewer_session_revocation
- [X] create_channel
- [ ] create_playback_restriction_policy
- [ ] create_recording_configuration
- [ ] create_stream_key
- [X] delete_channel
- [ ] delete_playback_key_pair
- [ ] delete_playback_restriction_policy
- [ ] delete_recording_configuration
- [ ] delete_stream_key
- [X] get_channel
- [ ] get_playback_key_pair
- [ ] get_playback_restriction_policy
- [ ] get_recording_configuration
- [ ] get_stream
- [ ] get_stream_key

- [ ] get_stream_session
- [ ] import_playback_key_pair
- [X] list_channels
- [ ] list_playback_key_pairs
- [ ] list_playback_restriction_policies
- [ ] list_recording_configurations
- [ ] list_stream_keys
- [ ] list_stream_sessions
- [ ] list_streams
- [ ] list_tags_for_resource
- [ ] put_metadata
- [ ] start_viewer_session_revocation
- [ ] stop_stream
- [ ] tag_resource
- [ ] untag_resource
- [X] update_channel
- [ ] update_playback_restriction_policy

### 2.10.65 kinesis

Implemented features for this service

- [X] add_tags_to_stream
- [X] create_stream
- [X] decrease_stream_retention_period
- [ ] delete_resource_policy
- [X] delete_stream
- [X] deregister_stream_consumer
- [ ] describe_limits
- [X] describe_stream
- [X] describe_stream_consumer
- [X] describe_stream_summary
- [X] disable_enhanced_monitoring
- [X] enable_enhanced_monitoring
- [X] get_records
- [ ] get_resource_policy
- [X] get_shard_iterator
- [X] increase_stream_retention_period

- [X] list_shards
- [X] list_stream_consumers

  Pagination is not yet implemented
- [X] list_streams
- [X] list_tags_for_stream
- [X] merge_shards
- [X] put_record
- [X] put_records
- [ ] put_resource_policy
- [X] register_stream_consumer
- [X] remove_tags_from_stream
- [X] split_shard
- [X] start_stream_encryption
- [X] stop_stream_encryption
- [ ] subscribe_to_shard
- [X] update_shard_count
- [X] update_stream_mode

### 2.10.66 kinesis-video-archived-media

Implemented features for this service

- [X] get_clip
- [X] get_dash_streaming_session_url
- [X] get_hls_streaming_session_url
- [ ] get_images
- [ ] get_media_for_fragment_list
- [ ] list_fragments

### 2.10.67 kinesisvideo

Implemented features for this service

- [ ] create_signaling_channel
- [X] create_stream
- [ ] delete_edge_configuration
- [ ] delete_signaling_channel
- [X] delete_stream

  The CurrentVersion-parameter is not yet implemented
- [ ] describe_edge_configuration

- [ ] describe_image_generation_configuration
- [ ] describe_mapped_resource_configuration
- [ ] describe_media_storage_configuration
- [ ] describe_notification_configuration
- [ ] describe_signaling_channel
- [X] describe_stream
- [X] get_data_endpoint
- [ ] get_signaling_channel_endpoint
- [ ] list_edge_agent_configurations
- [ ] list_signaling_channels
- [X] list_streams

  Pagination and the StreamNameCondition-parameter are not yet implemented
- [ ] list_tags_for_resource
- [ ] list_tags_for_stream
- [ ] start_edge_configuration_update
- [ ] tag_resource
- [ ] tag_stream
- [ ] untag_resource
- [ ] untag_stream
- [ ] update_data_retention
- [ ] update_image_generation_configuration
- [ ] update_media_storage_configuration
- [ ] update_notification_configuration
- [ ] update_signaling_channel
- [ ] update_stream

### 2.10.68 kms

Implemented features for this service

- [X] cancel_key_deletion
- [ ] connect_custom_key_store
- [ ] create_alias
- [ ] create_custom_key_store
- [X] create_grant
- [X] create_key

  The provided Policy currently does not need to be valid. If it is valid, Moto will perform authorization checks on key-related operations, just like AWS does.

**These authorization checks are quite basic for now. Moto will only throw an AccessDeniedException if the following conditions are met:**

- The principal is set to "*"
- The resource is set to "*"
- The Action matches *describe_key*

- [X] decrypt
- [X] delete_alias Delete the alias.
- [ ] delete_custom_key_store
- [ ] delete_imported_key_material
- [ ] describe_custom_key_stores
- [X] describe_key
- [X] disable_key
- [X] disable_key_rotation
- [ ] disconnect_custom_key_store
- [X] enable_key
- [X] enable_key_rotation
- [X] encrypt
- [X] generate_data_key
- [ ] generate_data_key_pair
- [ ] generate_data_key_pair_without_plaintext
- [ ] generate_data_key_without_plaintext
- [ ] generate_mac
- [ ] generate_random
- [X] get_key_policy
- [X] get_key_rotation_status
- [ ] get_parameters_for_import
- [X] get_public_key
- [ ] import_key_material
- [ ] list_aliases
- [X] list_grants
- [ ] list_key_policies
- [X] list_keys
- [X] list_resource_tags
- [X] list_retirable_grants
- [X] put_key_policy
- [X] re_encrypt
- [X] replicate_key

- [X] retire_grant
- [X] revoke_grant
- [X] schedule_key_deletion
- [X] sign

  Sign message using generated private key.

  - grant_tokens are not implemented
- [X] tag_resource
- [X] untag_resource
- [ ] update_alias
- [ ] update_custom_key_store
- [X] update_key_description
- [ ] update_primary_region
- [X] verify

  Verify message using public key from generated private key.

  - grant_tokens are not implemented
  - The MessageType-parameter DIGEST is not yet implemented
- [ ] verify_mac

### 2.10.69 lakeformation

Implemented features for this service

- [X] add_lf_tags_to_resource
- [ ] assume_decorated_role_with_saml
- [X] batch_grant_permissions
- [X] batch_revoke_permissions
- [ ] cancel_transaction
- [ ] commit_transaction
- [ ] create_data_cells_filter
- [ ] create_lake_formation_identity_center_configuration
- [ ] create_lake_formation_opt_in
- [X] create_lf_tag
- [ ] delete_data_cells_filter
- [ ] delete_lake_formation_identity_center_configuration
- [ ] delete_lake_formation_opt_in
- [X] delete_lf_tag
- [ ] delete_objects_on_cancel
- [X] deregister_resource

- [ ] describe_lake_formation_identity_center_configuration
- [X] describe_resource
- [ ] describe_transaction
- [ ] extend_transaction
- [ ] get_data_cells_filter
- [X] get_data_lake_settings
- [ ] get_effective_permissions_for_path
- [X] get_lf_tag
- [ ] get_query_state
- [ ] get_query_statistics
- [X] get_resource_lf_tags
- [ ] get_table_objects
- [ ] get_temporary_glue_partition_credentials
- [ ] get_temporary_glue_table_credentials
- [ ] get_work_unit_results
- [ ] get_work_units
- [X] grant_permissions
- [X] list_data_cells_filter

  This currently just returns an empty list, as the corresponding Create is not yet implemented
- [ ] list_lake_formation_opt_ins
- [X] list_lf_tags
- [X] list_permissions

  No pagination has been implemented yet.
- [X] list_resources
- [ ] list_table_storage_optimizers
- [ ] list_transactions
- [X] put_data_lake_settings
- [X] register_resource
- [X] remove_lf_tags_from_resource
- [X] revoke_permissions
- [ ] search_databases_by_lf_tags
- [ ] search_tables_by_lf_tags
- [ ] start_query_planning
- [ ] start_transaction
- [ ] update_data_cells_filter
- [ ] update_lake_formation_identity_center_configuration

- [X] update_lf_tag
- [ ] update_resource
- [ ] update_table_objects
- [ ] update_table_storage_optimizer

### 2.10.70 lambda

**class** moto.awslambda.models.**LambdaBackend**(*region_name: str*, *account_id: str*)

Implementation of the AWS Lambda endpoint. Invoking functions is supported - they will run inside a Docker container, emulating the real AWS behaviour as closely as possible.

> **Warning:** When invoking a function using the decorators, the created Docker container cannot reach Moto (or it's in-memory state). Any AWS SDK-requests within your Lambda will try to connect to AWS instead.

It is possible to connect from AWS Lambdas to other services, as long as you are running MotoProxy or the MotoServer in a Docker container.

When running the MotoProxy, calls to other AWS services are automatically proxied.

When running MotoServer, the Lambda has access to environment variables *MOTO_HOST* and *MOTO_PORT*, which can be used to build the url that MotoServer runs on:

```
def lambda_handler(event, context):
    host = os.environ.get("MOTO_HOST")
    port = os.environ.get("MOTO_PORT")
    url = host + ":" + port
    ec2 = boto3.client('ec2', region_name='us-west-2', endpoint_url=url)

    # Or even simpler:
    full_url = os.environ.get("MOTO_HTTP_ENDPOINT")
    ec2 = boto3.client("ec2", region_name="eu-west-1", endpoint_url=full_url)

    ec2.do_whatever_inside_the_existing_moto_server()
```

Moto will run on port 5000 by default. This can be overwritten by setting an environment variable when starting Moto:

```
# This env var will be propagated to the Docker container running the Lambda␣
↪functions
MOTO_PORT=5000 moto_server
```

The Docker container uses the default network mode, *bridge*. The following environment variables are available for fine-grained control over the Docker connection options:

```
# Provide the name of a custom network to connect to
MOTO_DOCKER_NETWORK_NAME=mycustomnetwork moto_server

# Override the network mode
# For example, network_mode=host would use the network of the host machine
# Note that this option will be ignored if MOTO_DOCKER_NETWORK_NAME is also set
MOTO_DOCKER_NETWORK_MODE=host moto_server
```

_-_-_-_

The Docker images used by Moto are taken from the following repositories:

- *mlupin/docker-lambda* (for recent versions)
- *lambci/lambda* (for older/outdated versions)

Use the following environment variable to configure Moto to look for images in an additional repository:

```
MOTO_DOCKER_LAMBDA_IMAGE=mlupin/docker-lambda
```

_-_-_-_

Use the following environment variable if you want to configure the data directory used by the Docker containers:

```
MOTO_LAMBDA_DATA_DIR=/tmp/data
```

_-_-_-_

If you want to mock the Lambda-containers invocation without starting a Docker-container, use the simple decorator:

```
@mock_aws(config={"lambda": {"use_docker": False}})
```

Implemented features for this service

- [ ] add_layer_version_permission
- [X] add_permission
- [X] create_alias
- [ ] create_code_signing_config
- [X] create_event_source_mapping
- [X] create_function

  The Code.ImageUri is not validated by default. Set environment variable MOTO_LAMBDA_STUB_ECR=false if you want to validate the image exists in our mocked ECR.

- [X] create_function_url_config

  The Qualifier-parameter is not yet implemented. Function URLs are not yet mocked, so invoking them will fail

- [X] delete_alias
- [ ] delete_code_signing_config
- [X] delete_event_source_mapping
- [X] delete_function
- [ ] delete_function_code_signing_config
- [X] delete_function_concurrency
- [X] delete_function_event_invoke_config
- [X] delete_function_url_config

  The Qualifier-parameter is not yet implemented

- [X] delete_layer_version

- [ ] delete_provisioned_concurrency_config
- [ ] get_account_settings
- [X] get_alias
- [X] get_code_signing_config
- [X] get_event_source_mapping
- [X] get_function
- [ ] get_function_code_signing_config
- [X] get_function_concurrency
- [ ] get_function_configuration
- [X] get_function_event_invoke_config
- [X] get_function_url_config

  The Qualifier-parameter is not yet implemented
- [X] get_layer_version
- [ ] get_layer_version_by_arn
- [ ] get_layer_version_policy
- [X] get_policy
- [ ] get_provisioned_concurrency_config
- [ ] get_runtime_management_config
- [X] invoke

  Invoking a Function with PackageType=Image is not yet supported.

  Invoking a Funcation against Lambda without docker now supports customised responses, the default being *Simple Lambda happy path OK*. You can use a dedicated API to override this, by configuring a queue of expected results.

  A request to *invoke* will take the first result from that queue.

  Configure this queue by making an HTTP request to */moto-api/static/lambda-simple/response*. An example invocation looks like this:

```
expected_results = {"results": ["test", "test 2"], "region": "us-east-1"}
resp = requests.post(
    "http://motoapi.amazonaws.com/moto-api/static/lambda-simple/response",
    json=expected_results
)
assert resp.status_code == 201

client = boto3.client("lambda", region_name="us-east-1")
resp = client.invoke(...) # resp["Payload"].read().decode() == "test"
resp = client.invoke(...) # resp["Payload"].read().decode() == "test2"
```

- [ ] invoke_async
- [ ] invoke_with_response_stream
- [X] list_aliases
- [ ] list_code_signing_configs

- [X] list_event_source_mappings
- [X] list_function_event_invoke_configs
- [ ] list_function_url_configs
- [X] list_functions
- [ ] list_functions_by_code_signing_config
- [ ] list_layer_versions
- [X] list_layers
- [ ] list_provisioned_concurrency_configs
- [X] list_tags
- [X] list_versions_by_function
- [X] publish_layer_version
- [ ] publish_version
- [ ] put_function_code_signing_config
- [X] put_function_concurrency Establish concurrency limit/reservations for a function

  Actual lambda restricts concurrency to 1000 (default) per region/account across all functions; we approximate that behavior by summing across all functions (hopefully all in the same account and region) and allowing the caller to simulate an increased quota.

  By default, no quota is enforced in order to preserve compatibility with existing code that assumes it can do as many things as it likes. To model actual AWS behavior, define the MOTO_LAMBDA_CONCURRENCY_QUOTA environment variable prior to testing.
- [X] put_function_event_invoke_config
- [ ] put_provisioned_concurrency_config
- [ ] put_runtime_management_config
- [ ] remove_layer_version_permission
- [X] remove_permission
- [X] tag_resource
- [X] untag_resource
- [X] update_alias

  The RevisionId parameter is not yet implemented
- [ ] update_code_signing_config
- [X] update_event_source_mapping
- [X] update_function_code
- [X] update_function_configuration
- [X] update_function_event_invoke_config
- [X] update_function_url_config

  The Qualifier-parameter is not yet implemented

### 2.10.71 logs

Implemented features for this service

- [ ] associate_kms_key
- [ ] cancel_export_task
- [ ] create_delivery
- [X] create_export_task
- [ ] create_log_anomaly_detector
- [X] create_log_group
- [X] create_log_stream
- [ ] delete_account_policy
- [ ] delete_data_protection_policy
- [ ] delete_delivery
- [ ] delete_delivery_destination
- [ ] delete_delivery_destination_policy
- [ ] delete_delivery_source
- [X] delete_destination
- [ ] delete_log_anomaly_detector
- [X] delete_log_group
- [X] delete_log_stream
- [X] delete_metric_filter
- [ ] delete_query_definition
- [X] delete_resource_policy

  Remove resource policy with a policy name matching given name.
- [X] delete_retention_policy
- [X] delete_subscription_filter
- [ ] describe_account_policies
- [ ] describe_deliveries
- [ ] describe_delivery_destinations
- [ ] describe_delivery_sources
- [X] describe_destinations
- [X] describe_export_tasks

  Pagination is not yet implemented
- [X] describe_log_groups
- [X] describe_log_streams
- [X] describe_metric_filters
- [X] describe_queries

Pagination is not yet implemented

- [ ] describe_query_definitions
- [X] describe_resource_policies

  Return list of resource policies.

  The next_token and limit arguments are ignored. The maximum number of resource policies per region is a small number (less than 50), so pagination isn't needed.

- [X] describe_subscription_filters
- [ ] disassociate_kms_key
- [X] filter_log_events

  The following filter patterns are currently supported: Single Terms, Multiple Terms, Exact Phrases. If the pattern is not supported, all events are returned.

- [ ] get_data_protection_policy
- [ ] get_delivery
- [ ] get_delivery_destination
- [ ] get_delivery_destination_policy
- [ ] get_delivery_source
- [ ] get_log_anomaly_detector
- [X] get_log_events
- [ ] get_log_group_fields
- [ ] get_log_record
- [X] get_query_results

  Not all query commands are implemented yet. Please raise an issue if you encounter unexpected results.

- [ ] list_anomalies
- [ ] list_log_anomaly_detectors
- [X] list_tags_for_resource
- [X] list_tags_log_group
- [ ] put_account_policy
- [ ] put_data_protection_policy
- [ ] put_delivery_destination
- [ ] put_delivery_destination_policy
- [ ] put_delivery_source
- [X] put_destination
- [X] put_destination_policy
- [X] put_log_events

  The SequenceToken-parameter is not yet implemented

- [X] put_metric_filter

- [ ] put_query_definition
- [X] put_resource_policy

  Creates/updates resource policy and return policy object
- [X] put_retention_policy
- [X] put_subscription_filter
- [ ] start_live_tail
- [X] start_query
- [ ] stop_query
- [X] tag_log_group
- [X] tag_resource
- [ ] test_metric_filter
- [X] untag_log_group
- [X] untag_resource
- [ ] update_anomaly
- [ ] update_log_anomaly_detector

### 2.10.72 managedblockchain

Implemented features for this service

- [ ] create_accessor
- [X] create_member
- [X] create_network
- [X] create_node
- [X] create_proposal
- [ ] delete_accessor
- [X] delete_member
- [X] delete_node
- [ ] get_accessor
- [X] get_member
- [X] get_network
- [X] get_node
- [X] get_proposal
- [ ] list_accessors
- [X] list_invitations
- [X] list_members
- [X] list_networks
- [X] list_nodes

- [X] list_proposal_votes
- [X] list_proposals
- [ ] list_tags_for_resource
- [X] reject_invitation
- [ ] tag_resource
- [ ] untag_resource
- [X] update_member
- [X] update_node
- [X] vote_on_proposal

### 2.10.73 mediaconnect

Implemented features for this service

- [ ] add_bridge_outputs
- [ ] add_bridge_sources
- [ ] add_flow_media_streams
- [X] add_flow_outputs
- [X] add_flow_sources
- [X] add_flow_vpc_interfaces
- [ ] create_bridge
- [X] create_flow
- [ ] create_gateway
- [ ] delete_bridge
- [X] delete_flow
- [ ] delete_gateway
- [ ] deregister_gateway_instance
- [ ] describe_bridge
- [X] describe_flow
- [ ] describe_flow_source_metadata
- [ ] describe_gateway
- [ ] describe_gateway_instance
- [ ] describe_offering
- [ ] describe_reservation
- [X] grant_flow_entitlements
- [ ] list_bridges
- [ ] list_entitlements
- [X] list_flows

Pagination is not yet implemented

- [ ] list_gateway_instances
- [ ] list_gateways
- [ ] list_offerings
- [ ] list_reservations
- [X] list_tags_for_resource
- [ ] purchase_offering
- [ ] remove_bridge_output
- [ ] remove_bridge_source
- [ ] remove_flow_media_stream
- [X] remove_flow_output
- [ ] remove_flow_source
- [X] remove_flow_vpc_interface
- [X] revoke_flow_entitlement
- [X] start_flow
- [X] stop_flow
- [X] tag_resource
- [ ] untag_resource
- [ ] update_bridge
- [ ] update_bridge_output
- [ ] update_bridge_source
- [ ] update_bridge_state
- [ ] update_flow
- [X] update_flow_entitlement
- [ ] update_flow_media_stream
- [X] update_flow_output
- [X] update_flow_source
- [ ] update_gateway_instance

### 2.10.74 medialive

Implemented features for this service

- [ ] accept_input_device_transfer
- [ ] batch_delete
- [ ] batch_start
- [ ] batch_stop
- [ ] batch_update_schedule

- [ ] cancel_input_device_transfer
- [ ] claim_device
- [X] create_channel

  The RequestID and Reserved parameters are not yet implemented
- [X] create_input

  The VPC and RequestId parameters are not yet implemented
- [ ] create_input_security_group
- [ ] create_multiplex
- [ ] create_multiplex_program
- [ ] create_partner_input
- [ ] create_tags
- [X] delete_channel
- [X] delete_input
- [ ] delete_input_security_group
- [ ] delete_multiplex
- [ ] delete_multiplex_program
- [ ] delete_reservation
- [ ] delete_schedule
- [ ] delete_tags
- [ ] describe_account_configuration
- [X] describe_channel
- [X] describe_input
- [ ] describe_input_device
- [ ] describe_input_device_thumbnail
- [ ] describe_input_security_group
- [ ] describe_multiplex
- [ ] describe_multiplex_program
- [ ] describe_offering
- [ ] describe_reservation
- [ ] describe_schedule
- [ ] describe_thumbnails
- [X] list_channels

  Pagination is not yet implemented
- [ ] list_input_device_transfers
- [ ] list_input_devices
- [ ] list_input_security_groups

- [X] list_inputs

  Pagination is not yet implemented
- [ ] list_multiplex_programs
- [ ] list_multiplexes
- [ ] list_offerings
- [ ] list_reservations
- [ ] list_tags_for_resource
- [ ] purchase_offering
- [ ] reboot_input_device
- [ ] reject_input_device_transfer
- [ ] restart_channel_pipelines
- [X] start_channel
- [ ] start_input_device
- [ ] start_input_device_maintenance_window
- [ ] start_multiplex
- [X] stop_channel
- [ ] stop_input_device
- [ ] stop_multiplex
- [ ] transfer_input_device
- [ ] update_account_configuration
- [X] update_channel
- [ ] update_channel_class
- [X] update_input
- [ ] update_input_device
- [ ] update_input_security_group
- [ ] update_multiplex
- [ ] update_multiplex_program
- [ ] update_reservation

### 2.10.75 mediapackage

Implemented features for this service

- [ ] configure_logs
- [X] create_channel
- [ ] create_harvest_job
- [X] create_origin_endpoint
- [X] delete_channel

- [X] delete_origin_endpoint
- [X] describe_channel
- [ ] describe_harvest_job
- [X] describe_origin_endpoint
- [X] list_channels
- [ ] list_harvest_jobs
- [X] list_origin_endpoints
- [ ] list_tags_for_resource
- [ ] rotate_channel_credentials
- [ ] rotate_ingest_endpoint_credentials
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_channel
- [X] update_origin_endpoint

### 2.10.76 mediastore

Implemented features for this service

- [X] create_container
- [X] delete_container
- [ ] delete_container_policy
- [ ] delete_cors_policy
- [ ] delete_lifecycle_policy
- [ ] delete_metric_policy
- [X] describe_container
- [X] get_container_policy
- [ ] get_cors_policy
- [X] get_lifecycle_policy
- [X] get_metric_policy
- [X] list_containers

  Pagination is not yet implemented
- [X] list_tags_for_resource
- [X] put_container_policy
- [ ] put_cors_policy
- [X] put_lifecycle_policy
- [X] put_metric_policy
- [ ] start_access_logging

- [ ] stop_access_logging
- [ ] tag_resource
- [ ] untag_resource

### 2.10.77 mediastore-data

Implemented features for this service

- [X] delete_object
- [ ] describe_object
- [X] get_object

  The Range-parameter is not yet supported.
- [X] list_items

  The Path- and MaxResults-parameters are not yet supported.
- [X] put_object

  The following parameters are not yet implemented: ContentType, CacheControl, UploadAvailability

### 2.10.78 meteringmarketplace

Implemented features for this service

- [X] batch_meter_usage
- [ ] meter_usage
- [ ] register_usage
- [ ] resolve_customer

### 2.10.79 mq

**class** moto.mq.models.**MQBackend**(*region_name: str*, *account_id: str*)

No EC2 integration exists yet - subnet ID's and security group values are not validated. Default values may not exist.

Implemented features for this service

- [X] create_broker
- [X] create_configuration
- [X] create_tags
- [X] create_user
- [X] delete_broker
- [X] delete_tags
- [X] delete_user
- [X] describe_broker
- [ ] describe_broker_engine_types

- [ ] describe_broker_instance_options
- [X] describe_configuration
- [X] describe_configuration_revision
- [X] describe_user
- [X] list_brokers

  Pagination is not yet implemented
- [ ] list_configuration_revisions
- [X] list_configurations

  Pagination has not yet been implemented.
- [X] list_tags
- [X] list_users
- [ ] promote
- [X] reboot_broker
- [X] update_broker
- [X] update_configuration

  No validation occurs on the provided XML. The authenticationStrategy may be changed depending on the provided configuration.
- [X] update_user

### 2.10.80 neptune

**class** moto.neptune.models.**NeptuneBackend**(*region_name: str*, *account_id: str*)

Implementation of Neptune APIs.

Implemented features for this service

- [ ] add_role_to_db_cluster
- [ ] add_source_identifier_to_subscription
- [ ] add_tags_to_resource
- [ ] apply_pending_maintenance_action
- [ ] copy_db_cluster_parameter_group
- [ ] copy_db_cluster_snapshot
- [ ] copy_db_parameter_group
- [X] create_db_cluster
- [ ] create_db_cluster_endpoint
- [ ] create_db_cluster_parameter_group
- [ ] create_db_cluster_snapshot
- [ ] create_db_instance
- [ ] create_db_parameter_group

- [ ] create_db_subnet_group
- [ ] create_event_subscription
- [X] create_global_cluster
- [X] delete_db_cluster

  The parameters SkipFinalSnapshot and FinalDBSnapshotIdentifier are not yet implemented. The DeletionProtection-attribute is not yet enforced
- [ ] delete_db_cluster_endpoint
- [ ] delete_db_cluster_parameter_group
- [ ] delete_db_cluster_snapshot
- [ ] delete_db_instance
- [ ] delete_db_parameter_group
- [ ] delete_db_subnet_group
- [ ] delete_event_subscription
- [X] delete_global_cluster
- [ ] describe_db_cluster_endpoints
- [ ] describe_db_cluster_parameter_groups
- [ ] describe_db_cluster_parameters
- [ ] describe_db_cluster_snapshot_attributes
- [ ] describe_db_cluster_snapshots
- [X] describe_db_clusters

  Pagination and the Filters-argument is not yet implemented
- [ ] describe_db_engine_versions
- [ ] describe_db_instances
- [ ] describe_db_parameter_groups
- [ ] describe_db_parameters
- [ ] describe_db_subnet_groups
- [ ] describe_engine_default_cluster_parameters
- [ ] describe_engine_default_parameters
- [ ] describe_event_categories
- [ ] describe_event_subscriptions
- [ ] describe_events
- [X] describe_global_clusters
- [X] describe_orderable_db_instance_options

  Only the EngineVersion-parameter is currently implemented.
- [ ] describe_pending_maintenance_actions
- [ ] describe_valid_db_instance_modifications

- [ ] failover_db_cluster
- [ ] failover_global_cluster
- [ ] list_tags_for_resource
- [X] modify_db_cluster
- [ ] modify_db_cluster_endpoint
- [ ] modify_db_cluster_parameter_group
- [ ] modify_db_cluster_snapshot_attribute
- [ ] modify_db_instance
- [ ] modify_db_parameter_group
- [ ] modify_db_subnet_group
- [ ] modify_event_subscription
- [ ] modify_global_cluster
- [ ] promote_read_replica_db_cluster
- [ ] reboot_db_instance
- [ ] remove_from_global_cluster
- [ ] remove_role_from_db_cluster
- [ ] remove_source_identifier_from_subscription
- [ ] remove_tags_from_resource
- [ ] reset_db_cluster_parameter_group
- [ ] reset_db_parameter_group
- [ ] restore_db_cluster_from_snapshot
- [ ] restore_db_cluster_to_point_in_time
- [X] start_db_cluster
- [ ] stop_db_cluster

### 2.10.81 opensearch

**class** moto.opensearch.models.**OpenSearchServiceBackend**(*region_name: str*, *account_id: str*)

Implementation of OpenSearchService APIs.

Implemented features for this service

- [ ] accept_inbound_connection
- [ ] add_data_source
- [X] add_tags
- [ ] associate_package
- [ ] authorize_vpc_endpoint_access
- [ ] cancel_domain_config_change
- [ ] cancel_service_software_update

- [X] create_domain
- [ ] create_outbound_connection
- [ ] create_package
- [ ] create_vpc_endpoint
- [ ] delete_data_source
- [X] delete_domain
- [ ] delete_inbound_connection
- [ ] delete_outbound_connection
- [ ] delete_package
- [ ] delete_vpc_endpoint
- [X] describe_domain
- [ ] describe_domain_auto_tunes
- [ ] describe_domain_change_progress
- [X] describe_domain_config
- [ ] describe_domain_health
- [ ] describe_domain_nodes
- [ ] describe_domains
- [ ] describe_dry_run_progress
- [ ] describe_inbound_connections
- [ ] describe_instance_type_limits
- [ ] describe_outbound_connections
- [ ] describe_packages
- [ ] describe_reserved_instance_offerings
- [ ] describe_reserved_instances
- [ ] describe_vpc_endpoints
- [ ] dissociate_package
- [X] get_compatible_versions
- [ ] get_data_source
- [ ] get_domain_maintenance_status
- [ ] get_package_version_history
- [ ] get_upgrade_history
- [ ] get_upgrade_status
- [ ] list_data_sources
- [ ] list_domain_maintenances
- [X] list_domain_names
- [ ] list_domains_for_package

- [ ] list_instance_type_details
- [ ] list_packages_for_domain
- [ ] list_scheduled_actions
- [X] list_tags
- [ ] list_versions
- [ ] list_vpc_endpoint_access
- [ ] list_vpc_endpoints
- [ ] list_vpc_endpoints_for_domain
- [ ] purchase_reserved_instance_offering
- [ ] reject_inbound_connection
- [X] remove_tags
- [ ] revoke_vpc_endpoint_access
- [ ] start_domain_maintenance
- [ ] start_service_software_update
- [ ] update_data_source
- [X] update_domain_config
- [ ] update_package
- [ ] update_scheduled_action
- [ ] update_vpc_endpoint
- [ ] upgrade_domain

### 2.10.82 opsworks

Implemented features for this service

- [ ] assign_instance
- [ ] assign_volume
- [ ] associate_elastic_ip
- [ ] attach_elastic_load_balancer
- [ ] clone_stack
- [X] create_app
- [ ] create_deployment
- [X] create_instance
- [X] create_layer
- [X] create_stack
- [ ] create_user_profile
- [ ] delete_app
- [ ] delete_instance

- [ ] delete_layer
- [ ] delete_stack
- [ ] delete_user_profile
- [ ] deregister_ecs_cluster
- [ ] deregister_elastic_ip
- [ ] deregister_instance
- [ ] deregister_rds_db_instance
- [ ] deregister_volume
- [ ] describe_agent_versions
- [X] describe_apps
- [ ] describe_commands
- [ ] describe_deployments
- [ ] describe_ecs_clusters
- [ ] describe_elastic_ips
- [ ] describe_elastic_load_balancers
- [X] describe_instances
- [X] describe_layers
- [ ] describe_load_based_auto_scaling
- [ ] describe_my_user_profile
- [ ] describe_operating_systems
- [ ] describe_permissions
- [ ] describe_raid_arrays
- [ ] describe_rds_db_instances
- [ ] describe_service_errors
- [ ] describe_stack_provisioning_parameters
- [ ] describe_stack_summary
- [X] describe_stacks
- [ ] describe_time_based_auto_scaling
- [ ] describe_user_profiles
- [ ] describe_volumes
- [ ] detach_elastic_load_balancer
- [ ] disassociate_elastic_ip
- [ ] get_hostname_suggestion
- [ ] grant_access
- [ ] list_tags
- [ ] reboot_instance

- [ ] register_ecs_cluster
- [ ] register_elastic_ip
- [ ] register_instance
- [ ] register_rds_db_instance
- [ ] register_volume
- [ ] set_load_based_auto_scaling
- [ ] set_permission
- [ ] set_time_based_auto_scaling
- [X] start_instance
- [ ] start_stack
- [ ] stop_instance
- [ ] stop_stack
- [ ] tag_resource
- [ ] unassign_instance
- [ ] unassign_volume
- [ ] untag_resource
- [ ] update_app
- [ ] update_elastic_ip
- [ ] update_instance
- [ ] update_layer
- [ ] update_my_user_profile
- [ ] update_rds_db_instance
- [ ] update_stack
- [ ] update_user_profile
- [ ] update_volume

### 2.10.83 organizations

Implemented features for this service

- [ ] accept_handshake
- [X] attach_policy
- [ ] cancel_handshake
- [X] close_account
- [X] create_account
- [ ] create_gov_cloud_account
- [X] create_organization
- [X] create_organizational_unit

- [X] create_policy
- [ ] decline_handshake
- [X] delete_organization
- [X] delete_organizational_unit
- [X] delete_policy
- [ ] delete_resource_policy
- [X] deregister_delegated_administrator
- [X] describe_account
- [X] describe_create_account_status
- [ ] describe_effective_policy
- [ ] describe_handshake
- [X] describe_organization
- [X] describe_organizational_unit
- [X] describe_policy
- [ ] describe_resource_policy
- [X] detach_policy
- [X] disable_aws_service_access
- [X] disable_policy_type
- [ ] enable_all_features
- [X] enable_aws_service_access
- [X] enable_policy_type
- [ ] invite_account_to_organization
- [ ] leave_organization
- [X] list_accounts
- [X] list_accounts_for_parent
- [X] list_aws_service_access_for_organization
- [X] list_children
- [X] list_create_account_status
- [X] list_delegated_administrators
- [X] list_delegated_services_for_account
- [ ] list_handshakes_for_account
- [ ] list_handshakes_for_organization
- [X] list_organizational_units_for_parent
- [X] list_parents
- [X] list_policies
- [X] list_policies_for_target

- [X] list_roots
- [X] list_tags_for_resource
- [X] list_targets_for_policy
- [X] move_account
- [ ] put_resource_policy
- [X] register_delegated_administrator
- [X] remove_account_from_organization
- [X] tag_resource
- [X] untag_resource
- [X] update_organizational_unit
- [X] update_policy

### 2.10.84 panorama

Implemented features for this service

- [ ] create_application_instance
- [ ] create_job_for_devices
- [ ] create_node_from_template_job
- [ ] create_package
- [ ] create_package_import_job
- [X] delete_device
- [ ] delete_package
- [ ] deregister_package_version
- [ ] describe_application_instance
- [ ] describe_application_instance_details
- [X] describe_device
- [ ] describe_device_job
- [ ] describe_node
- [ ] describe_node_from_template_job
- [ ] describe_package
- [ ] describe_package_import_job
- [ ] describe_package_version
- [ ] list_application_instance_dependencies
- [ ] list_application_instance_node_instances
- [ ] list_application_instances
- [X] list_devices
- [ ] list_devices_jobs

- [ ] list_node_from_template_jobs
- [ ] list_nodes
- [ ] list_package_import_jobs
- [ ] list_packages
- [ ] list_tags_for_resource
- [X] provision_device
- [ ] register_package_version
- [ ] remove_application_instance
- [ ] signal_application_instance_node_instances
- [ ] tag_resource
- [ ] untag_resource
- [X] update_device_metadata

### 2.10.85 Patching other Services

Since `moto` does not support every AWS service available there is a way to patch `boto3` calls until they are supported.

To do so, you need to mock the `botocore.client.BaseClient._make_api_call` function using mock.patch:

```
import boto3
import botocore
from unittest.mock import patch

# Original botocore _make_api_call function
orig = botocore.client.BaseClient._make_api_call

# Mocked botocore _make_api_call function
def mock_make_api_call(self, operation_name, kwarg):
    # For example for the Access Analyzer service
    # As you can see the operation_name has the list_analyzers snake_case form but
    # we are using the ListAnalyzers form.
    # Rationale -> https://github.com/boto/botocore/blob/develop/botocore/client.py
↪#L810:L816
    if operation_name == 'ListAnalyzers':
        return { "analyzers":
            [{
                "arn": "ARN",
                "name": "Test Analyzer" ,
                "status": "Enabled",
                "findings": 0,
                "tags":"",
                "type": "ACCOUNT",
                "region": "eu-west-1"
                }
            ]}
    # If we don't want to patch the API call
    return orig(self, operation_name, kwarg)
```

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```
def test_list_findings():
    client = boto3.client("accessanalyzer")

    with patch('botocore.client.BaseClient._make_api_call', new=mock_make_api_call):
        analyzers_list = client.list_analyzers()
        assert len(analyzers_list["analyzers"]) == 1
        # include your assertions here
```

Note that this does not use Moto, to keep it simple, but if you use any `moto`-decorators in addition to the patch, the call to `orig(self, operation_name, kwarg)` will be intercepted by Moto.

### 2.10.86 personalize

**class** moto.personalize.models.**PersonalizeBackend**(*region_name: str*, *account_id: str*)

Implementation of Personalize APIs.

Implemented features for this service

- [ ] create_batch_inference_job
- [ ] create_batch_segment_job
- [ ] create_campaign
- [ ] create_dataset
- [ ] create_dataset_export_job
- [ ] create_dataset_group
- [ ] create_dataset_import_job
- [ ] create_event_tracker
- [ ] create_filter
- [ ] create_metric_attribution
- [ ] create_recommender
- [X] create_schema
- [ ] create_solution
- [ ] create_solution_version
- [ ] delete_campaign
- [ ] delete_dataset
- [ ] delete_dataset_group
- [ ] delete_event_tracker
- [ ] delete_filter
- [ ] delete_metric_attribution
- [ ] delete_recommender
- [X] delete_schema

- [ ] delete_solution
- [ ] describe_algorithm
- [ ] describe_batch_inference_job
- [ ] describe_batch_segment_job
- [ ] describe_campaign
- [ ] describe_dataset
- [ ] describe_dataset_export_job
- [ ] describe_dataset_group
- [ ] describe_dataset_import_job
- [ ] describe_event_tracker
- [ ] describe_feature_transformation
- [ ] describe_filter
- [ ] describe_metric_attribution
- [ ] describe_recipe
- [ ] describe_recommender
- [X] describe_schema
- [ ] describe_solution
- [ ] describe_solution_version
- [ ] get_solution_metrics
- [ ] list_batch_inference_jobs
- [ ] list_batch_segment_jobs
- [ ] list_campaigns
- [ ] list_dataset_export_jobs
- [ ] list_dataset_groups
- [ ] list_dataset_import_jobs
- [ ] list_datasets
- [ ] list_event_trackers
- [ ] list_filters
- [ ] list_metric_attribution_metrics
- [ ] list_metric_attributions
- [ ] list_recipes
- [ ] list_recommenders
- [X] list_schemas

  Pagination is not yet implemented
- [ ] list_solution_versions
- [ ] list_solutions

- [ ] list_tags_for_resource
- [ ] start_recommender
- [ ] stop_recommender
- [ ] stop_solution_version_creation
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_campaign
- [ ] update_dataset
- [ ] update_metric_attribution
- [ ] update_recommender

### 2.10.87 pinpoint

**class** moto.pinpoint.models.**PinpointBackend**(*region_name: str*, *account_id: str*)

Implementation of Pinpoint APIs.

Implemented features for this service

- [X] create_app
- [ ] create_campaign
- [ ] create_email_template
- [ ] create_export_job
- [ ] create_import_job
- [ ] create_in_app_template
- [ ] create_journey
- [ ] create_push_template
- [ ] create_recommender_configuration
- [ ] create_segment
- [ ] create_sms_template
- [ ] create_voice_template
- [ ] delete_adm_channel
- [ ] delete_apns_channel
- [ ] delete_apns_sandbox_channel
- [ ] delete_apns_voip_channel
- [ ] delete_apns_voip_sandbox_channel
- [X] delete_app
- [ ] delete_baidu_channel
- [ ] delete_campaign
- [ ] delete_email_channel

- [ ] delete_email_template
- [ ] delete_endpoint
- [X] delete_event_stream
- [ ] delete_gcm_channel
- [ ] delete_in_app_template
- [ ] delete_journey
- [ ] delete_push_template
- [ ] delete_recommender_configuration
- [ ] delete_segment
- [ ] delete_sms_channel
- [ ] delete_sms_template
- [ ] delete_user_endpoints
- [ ] delete_voice_channel
- [ ] delete_voice_template
- [ ] get_adm_channel
- [ ] get_apns_channel
- [ ] get_apns_sandbox_channel
- [ ] get_apns_voip_channel
- [ ] get_apns_voip_sandbox_channel
- [X] get_app
- [ ] get_application_date_range_kpi
- [X] get_application_settings
- [X] get_apps

  Pagination is not yet implemented
- [ ] get_baidu_channel
- [ ] get_campaign
- [ ] get_campaign_activities
- [ ] get_campaign_date_range_kpi
- [ ] get_campaign_version
- [ ] get_campaign_versions
- [ ] get_campaigns
- [ ] get_channels
- [ ] get_email_channel
- [ ] get_email_template
- [ ] get_endpoint
- [X] get_event_stream

- [ ] get_export_job
- [ ] get_export_jobs
- [ ] get_gcm_channel
- [ ] get_import_job
- [ ] get_import_jobs
- [ ] get_in_app_messages
- [ ] get_in_app_template
- [ ] get_journey
- [ ] get_journey_date_range_kpi
- [ ] get_journey_execution_activity_metrics
- [ ] get_journey_execution_metrics
- [ ] get_journey_run_execution_activity_metrics
- [ ] get_journey_run_execution_metrics
- [ ] get_journey_runs
- [ ] get_push_template
- [ ] get_recommender_configuration
- [ ] get_recommender_configurations
- [ ] get_segment
- [ ] get_segment_export_jobs
- [ ] get_segment_import_jobs
- [ ] get_segment_version
- [ ] get_segment_versions
- [ ] get_segments
- [ ] get_sms_channel
- [ ] get_sms_template
- [ ] get_user_endpoints
- [ ] get_voice_channel
- [ ] get_voice_template
- [ ] list_journeys
- [X] list_tags_for_resource
- [ ] list_template_versions
- [ ] list_templates
- [ ] phone_number_validate
- [X] put_event_stream
- [ ] put_events
- [ ] remove_attributes

- [ ] send_messages
- [ ] send_otp_message
- [ ] send_users_messages
- [X] tag_resource
- [X] untag_resource
- [ ] update_adm_channel
- [ ] update_apns_channel
- [ ] update_apns_sandbox_channel
- [ ] update_apns_voip_channel
- [ ] update_apns_voip_sandbox_channel
- [X] update_application_settings
- [ ] update_baidu_channel
- [ ] update_campaign
- [ ] update_email_channel
- [ ] update_email_template
- [ ] update_endpoint
- [ ] update_endpoints_batch
- [ ] update_gcm_channel
- [ ] update_in_app_template
- [ ] update_journey
- [ ] update_journey_state
- [ ] update_push_template
- [ ] update_recommender_configuration
- [ ] update_segment
- [ ] update_sms_channel
- [ ] update_sms_template
- [ ] update_template_active_version
- [ ] update_voice_channel
- [ ] update_voice_template
- [ ] verify_otp_message

### 2.10.88 polly

Implemented features for this service

- [X] delete_lexicon
- [X] describe_voices

  Pagination is not yet implemented
- [X] get_lexicon
- [ ] get_speech_synthesis_task
- [X] list_lexicons

  Pagination is not yet implemented
- [ ] list_speech_synthesis_tasks
- [X] put_lexicon
- [ ] start_speech_synthesis_task
- [ ] synthesize_speech

### 2.10.89 quicksight

**class** moto.quicksight.models.**QuickSightBackend**(*region_name: str*, *account_id: str*)

Implementation of QuickSight APIs.

Implemented features for this service

- [ ] cancel_ingestion
- [ ] create_account_customization
- [ ] create_account_subscription
- [ ] create_analysis
- [ ] create_dashboard
- [X] create_data_set
- [ ] create_data_source
- [ ] create_folder
- [ ] create_folder_membership
- [X] create_group
- [X] create_group_membership
- [ ] create_iam_policy_assignment
- [X] create_ingestion
- [ ] create_namespace
- [ ] create_refresh_schedule
- [ ] create_role_membership
- [ ] create_template
- [ ] create_template_alias

- [ ] create_theme
- [ ] create_theme_alias
- [ ] create_topic
- [ ] create_topic_refresh_schedule
- [ ] create_vpc_connection
- [ ] delete_account_customization
- [ ] delete_account_subscription
- [ ] delete_analysis
- [ ] delete_dashboard
- [ ] delete_data_set
- [ ] delete_data_set_refresh_properties
- [ ] delete_data_source
- [ ] delete_folder
- [ ] delete_folder_membership
- [X] delete_group
- [ ] delete_group_membership
- [ ] delete_iam_policy_assignment
- [ ] delete_identity_propagation_config
- [ ] delete_namespace
- [ ] delete_refresh_schedule
- [ ] delete_role_custom_permission
- [ ] delete_role_membership
- [ ] delete_template
- [ ] delete_template_alias
- [ ] delete_theme
- [ ] delete_theme_alias
- [ ] delete_topic
- [ ] delete_topic_refresh_schedule
- [X] delete_user
- [ ] delete_user_by_principal_id
- [ ] delete_vpc_connection
- [ ] describe_account_customization
- [ ] describe_account_settings
- [ ] describe_account_subscription
- [ ] describe_analysis
- [ ] describe_analysis_definition

- [ ] describe_analysis_permissions
- [ ] describe_asset_bundle_export_job
- [ ] describe_asset_bundle_import_job
- [ ] describe_dashboard
- [ ] describe_dashboard_definition
- [ ] describe_dashboard_permissions
- [ ] describe_dashboard_snapshot_job
- [ ] describe_dashboard_snapshot_job_result
- [ ] describe_data_set
- [ ] describe_data_set_permissions
- [ ] describe_data_set_refresh_properties
- [ ] describe_data_source
- [ ] describe_data_source_permissions
- [ ] describe_folder
- [ ] describe_folder_permissions
- [ ] describe_folder_resolved_permissions
- [X] describe_group
- [X] describe_group_membership
- [ ] describe_iam_policy_assignment
- [ ] describe_ingestion
- [ ] describe_ip_restriction
- [ ] describe_namespace
- [ ] describe_refresh_schedule
- [ ] describe_role_custom_permission
- [ ] describe_template
- [ ] describe_template_alias
- [ ] describe_template_definition
- [ ] describe_template_permissions
- [ ] describe_theme
- [ ] describe_theme_alias
- [ ] describe_theme_permissions
- [ ] describe_topic
- [ ] describe_topic_permissions
- [ ] describe_topic_refresh
- [ ] describe_topic_refresh_schedule
- [X] describe_user

- [ ] describe_vpc_connection
- [ ] generate_embed_url_for_anonymous_user
- [ ] generate_embed_url_for_registered_user
- [ ] get_dashboard_embed_url
- [ ] get_session_embed_url
- [ ] list_analyses
- [ ] list_asset_bundle_export_jobs
- [ ] list_asset_bundle_import_jobs
- [ ] list_dashboard_versions
- [ ] list_dashboards
- [ ] list_data_sets
- [ ] list_data_sources
- [ ] list_folder_members
- [ ] list_folders
- [X] list_group_memberships

  The NextToken and MaxResults parameters are not yet implemented
- [X] list_groups

  The NextToken and MaxResults parameters are not yet implemented
- [ ] list_iam_policy_assignments
- [ ] list_iam_policy_assignments_for_user
- [ ] list_identity_propagation_configs
- [ ] list_ingestions
- [ ] list_namespaces
- [ ] list_refresh_schedules
- [ ] list_role_memberships
- [ ] list_tags_for_resource
- [ ] list_template_aliases
- [ ] list_template_versions
- [ ] list_templates
- [ ] list_theme_aliases
- [ ] list_theme_versions
- [ ] list_themes
- [ ] list_topic_refresh_schedules
- [ ] list_topics
- [ ] list_user_groups
- [X] list_users

The NextToken and MaxResults parameters are not yet implemented

- [ ] list_vpc_connections
- [ ] put_data_set_refresh_properties
- [X] register_user

  The following parameters are not yet implemented: IamArn, SessionName, CustomsPermissionsName, ExternalLoginFederationProviderType, CustomFederationProviderUrl, ExternalLoginId
- [ ] restore_analysis
- [ ] search_analyses
- [ ] search_dashboards
- [ ] search_data_sets
- [ ] search_data_sources
- [ ] search_folders
- [ ] search_groups
- [ ] start_asset_bundle_export_job
- [ ] start_asset_bundle_import_job
- [ ] start_dashboard_snapshot_job
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_account_customization
- [ ] update_account_settings
- [ ] update_analysis
- [ ] update_analysis_permissions
- [ ] update_dashboard
- [ ] update_dashboard_links
- [ ] update_dashboard_permissions
- [ ] update_dashboard_published_version
- [ ] update_data_set
- [ ] update_data_set_permissions
- [ ] update_data_source
- [ ] update_data_source_permissions
- [ ] update_folder
- [ ] update_folder_permissions
- [X] update_group
- [ ] update_iam_policy_assignment
- [ ] update_identity_propagation_config
- [ ] update_ip_restriction

- [ ] update_public_sharing_settings
- [ ] update_refresh_schedule
- [ ] update_role_custom_permission
- [ ] update_template
- [ ] update_template_alias
- [ ] update_template_permissions
- [ ] update_theme
- [ ] update_theme_alias
- [ ] update_theme_permissions
- [ ] update_topic
- [ ] update_topic_permissions
- [ ] update_topic_refresh_schedule
- [ ] update_user
- [ ] update_vpc_connection

### 2.10.90 ram

Implemented features for this service

- [ ] accept_resource_share_invitation
- [ ] associate_resource_share
- [ ] associate_resource_share_permission
- [ ] create_permission
- [ ] create_permission_version
- [X] create_resource_share
- [ ] delete_permission
- [ ] delete_permission_version
- [X] delete_resource_share
- [ ] disassociate_resource_share
- [ ] disassociate_resource_share_permission
- [X] enable_sharing_with_aws_organization
- [ ] get_permission
- [ ] get_resource_policies
- [ ] get_resource_share_associations
- [ ] get_resource_share_invitations
- [X] get_resource_shares
- [ ] list_pending_invitation_resources
- [ ] list_permission_associations

- [ ] list_permission_versions
- [ ] list_permissions
- [ ] list_principals
- [ ] list_replace_permission_associations_work
- [ ] list_resource_share_permissions
- [ ] list_resource_types
- [ ] list_resources
- [ ] promote_permission_created_from_policy
- [ ] promote_resource_share_created_from_policy
- [ ] reject_resource_share_invitation
- [ ] replace_permission_associations
- [ ] set_default_permission_version
- [ ] tag_resource
- [ ] untag_resource
- [X] update_resource_share

### 2.10.91 rds

Implemented features for this service

- [ ] add_role_to_db_cluster
- [ ] add_role_to_db_instance
- [ ] add_source_identifier_to_subscription
- [X] add_tags_to_resource
- [ ] apply_pending_maintenance_action
- [ ] authorize_db_security_group_ingress
- [ ] backtrack_db_cluster
- [X] cancel_export_task
- [ ] copy_db_cluster_parameter_group
- [X] copy_db_cluster_snapshot
- [ ] copy_db_parameter_group
- [X] copy_db_snapshot
- [ ] copy_option_group
- [ ] create_blue_green_deployment
- [ ] create_custom_db_engine_version
- [X] create_db_cluster
- [ ] create_db_cluster_endpoint
- [X] create_db_cluster_parameter_group

- [X] create_db_cluster_snapshot
- [X] create_db_instance
- [X] create_db_instance_read_replica
- [X] create_db_parameter_group
- [X] create_db_proxy
- [ ] create_db_proxy_endpoint
- [X] create_db_security_group
- [ ] create_db_shard_group
- [X] create_db_snapshot
- [ ] create_db_subnet_group
- [X] create_event_subscription
- [X] create_global_cluster
- [ ] create_integration
- [X] create_option_group
- [ ] create_tenant_database
- [ ] delete_blue_green_deployment
- [ ] delete_custom_db_engine_version
- [X] delete_db_cluster
- [ ] delete_db_cluster_automated_backup
- [ ] delete_db_cluster_endpoint
- [X] delete_db_cluster_parameter_group
- [X] delete_db_cluster_snapshot
- [X] delete_db_instance
- [ ] delete_db_instance_automated_backup
- [X] delete_db_parameter_group
- [ ] delete_db_proxy
- [ ] delete_db_proxy_endpoint
- [ ] delete_db_security_group
- [ ] delete_db_shard_group
- [X] delete_db_snapshot
- [ ] delete_db_subnet_group
- [X] delete_event_subscription
- [X] delete_global_cluster
- [ ] delete_integration
- [X] delete_option_group
- [ ] delete_tenant_database

- [ ] deregister_db_proxy_targets
- [ ] describe_account_attributes
- [ ] describe_blue_green_deployments
- [ ] describe_certificates
- [ ] describe_db_cluster_automated_backups
- [ ] describe_db_cluster_backtracks
- [ ] describe_db_cluster_endpoints
- [X] describe_db_cluster_parameter_groups
- [X] describe_db_cluster_parameters
- [X] describe_db_cluster_snapshot_attributes
- [X] describe_db_cluster_snapshots
- [X] describe_db_clusters
- [ ] describe_db_engine_versions
- [ ] describe_db_instance_automated_backups
- [X] describe_db_instances
- [ ] describe_db_log_files
- [X] describe_db_parameter_groups
- [ ] describe_db_parameters
- [X] describe_db_proxies

  The filters-argument is not yet supported
- [ ] describe_db_proxy_endpoints
- [ ] describe_db_proxy_target_groups
- [ ] describe_db_proxy_targets
- [ ] describe_db_recommendations
- [ ] describe_db_security_groups
- [ ] describe_db_shard_groups
- [X] describe_db_snapshot_attributes
- [ ] describe_db_snapshot_tenant_databases
- [X] describe_db_snapshots
- [X] describe_db_subnet_groups
- [ ] describe_engine_default_cluster_parameters
- [ ] describe_engine_default_parameters
- [ ] describe_event_categories
- [X] describe_event_subscriptions
- [ ] describe_events
- [X] describe_export_tasks

- [X] describe_global_clusters
- [ ] describe_integrations
- [X] describe_option_group_options
- [X] describe_option_groups
- [X] describe_orderable_db_instance_options

  Only the Aurora-Postgresql and Neptune-engine is currently implemented
- [ ] describe_pending_maintenance_actions
- [ ] describe_reserved_db_instances
- [ ] describe_reserved_db_instances_offerings
- [ ] describe_source_regions
- [ ] describe_tenant_databases
- [ ] describe_valid_db_instance_modifications
- [ ] disable_http_endpoint
- [ ] download_db_log_file_portion
- [ ] enable_http_endpoint
- [ ] failover_db_cluster
- [ ] failover_global_cluster
- [X] list_tags_for_resource
- [ ] modify_activity_stream
- [ ] modify_certificates
- [ ] modify_current_db_cluster_capacity
- [ ] modify_custom_db_engine_version
- [X] modify_db_cluster
- [ ] modify_db_cluster_endpoint
- [ ] modify_db_cluster_parameter_group
- [X] modify_db_cluster_snapshot_attribute
- [X] modify_db_instance
- [X] modify_db_parameter_group
- [ ] modify_db_proxy
- [ ] modify_db_proxy_endpoint
- [ ] modify_db_proxy_target_group
- [ ] modify_db_recommendation
- [ ] modify_db_shard_group
- [ ] modify_db_snapshot
- [X] modify_db_snapshot_attribute
- [X] modify_db_subnet_group

- [ ] modify_event_subscription
- [ ] modify_global_cluster
- [X] modify_option_group
- [ ] modify_tenant_database
- [X] promote_read_replica
- [X] promote_read_replica_db_cluster
- [ ] purchase_reserved_db_instances_offering
- [ ] reboot_db_cluster
- [X] reboot_db_instance
- [ ] reboot_db_shard_group
- [ ] register_db_proxy_targets
- [X] remove_from_global_cluster
- [ ] remove_role_from_db_cluster
- [ ] remove_role_from_db_instance
- [ ] remove_source_identifier_from_subscription
- [X] remove_tags_from_resource
- [ ] reset_db_cluster_parameter_group
- [ ] reset_db_parameter_group
- [ ] restore_db_cluster_from_s3
- [X] restore_db_cluster_from_snapshot
- [ ] restore_db_cluster_to_point_in_time
- [X] restore_db_instance_from_db_snapshot
- [ ] restore_db_instance_from_s3
- [X] restore_db_instance_to_point_in_time
- [ ] revoke_db_security_group_ingress
- [ ] start_activity_stream
- [X] start_db_cluster
- [X] start_db_instance
- [ ] start_db_instance_automated_backups_replication
- [X] start_export_task
- [ ] stop_activity_stream
- [X] stop_db_cluster
- [X] stop_db_instance
- [ ] stop_db_instance_automated_backups_replication
- [ ] switchover_blue_green_deployment
- [ ] switchover_global_cluster

- [ ] switchover_read_replica

### 2.10.92 rds-data

Implemented features for this service

- [ ] batch_execute_statement
- [ ] begin_transaction
- [ ] commit_transaction
- [ ] execute_sql
- [X] execute_statement

  There is no validation yet on any of the input parameters.

  SQL statements are not executed by Moto, so this call will always return 0 records by default.

  You can use a dedicated API to override this, by configuring a queue of expected results.

  A request to *execute_statement* will take the first result from that queue, and assign it to the provided SQL-query. Subsequent requests using the same SQL-query will return the same result. Other requests using a different SQL-query will take the next result from the queue, or return an empty result if the queue is empty.

  Configure this queue by making an HTTP request to */moto-api/static/rds-data/statement-results*. An example invocation looks like this:

```
expected_results = {
    "account_id": "123456789012",  # This is the default - can be omitted
    "region": "us-east-1",  # This is the default - can be omitted
    "results": [
        {
            "records": [...],
            "columnMetadata": [...],
            "numberOfRecordsUpdated": 42,
            "generatedFields": [...],
            "formattedRecords": "some json"
        },
        # other results as required
    ],
}
resp = requests.post(
    "http://motoapi.amazonaws.com/moto-api/static/rds-data/statement-results
↪",
    json=expected_results,
)
assert resp.status_code == 201

rdsdata = boto3.client("rds-data", region_name="us-east-1")
resp = rdsdata.execute_statement(resourceArn="not applicable", secretArn=
↪"not applicable", sql="SELECT some FROM thing")
```

- [ ] rollback_transaction

### 2.10.93 redshift

Implemented features for this service

- [ ] accept_reserved_node_exchange
- [ ] add_partner
- [ ] associate_data_share_consumer
- [X] authorize_cluster_security_group_ingress
- [ ] authorize_data_share
- [ ] authorize_endpoint_access
- [ ] authorize_snapshot_access
- [ ] batch_delete_cluster_snapshots
- [ ] batch_modify_cluster_snapshots
- [ ] cancel_resize
- [ ] copy_cluster_snapshot
- [ ] create_authentication_profile
- [X] create_cluster
- [X] create_cluster_parameter_group
- [X] create_cluster_security_group
- [X] create_cluster_snapshot
- [X] create_cluster_subnet_group
- [ ] create_custom_domain_association
- [ ] create_endpoint_access
- [ ] create_event_subscription
- [ ] create_hsm_client_certificate
- [ ] create_hsm_configuration
- [ ] create_redshift_idc_application
- [ ] create_scheduled_action
- [X] create_snapshot_copy_grant
- [ ] create_snapshot_schedule
- [X] create_tags
- [ ] create_usage_limit
- [ ] deauthorize_data_share
- [ ] delete_authentication_profile
- [X] delete_cluster
- [X] delete_cluster_parameter_group
- [X] delete_cluster_security_group
- [X] delete_cluster_snapshot

- [X] delete_cluster_subnet_group
- [ ] delete_custom_domain_association
- [ ] delete_endpoint_access
- [ ] delete_event_subscription
- [ ] delete_hsm_client_certificate
- [ ] delete_hsm_configuration
- [ ] delete_partner
- [ ] delete_redshift_idc_application
- [ ] delete_resource_policy
- [ ] delete_scheduled_action
- [X] delete_snapshot_copy_grant
- [ ] delete_snapshot_schedule
- [X] delete_tags
- [ ] delete_usage_limit
- [ ] describe_account_attributes
- [ ] describe_authentication_profiles
- [ ] describe_cluster_db_revisions
- [X] describe_cluster_parameter_groups
- [ ] describe_cluster_parameters
- [X] describe_cluster_security_groups
- [X] describe_cluster_snapshots
- [X] describe_cluster_subnet_groups
- [ ] describe_cluster_tracks
- [ ] describe_cluster_versions
- [X] describe_clusters
- [ ] describe_custom_domain_associations
- [ ] describe_data_shares
- [ ] describe_data_shares_for_consumer
- [ ] describe_data_shares_for_producer
- [ ] describe_default_cluster_parameters
- [ ] describe_endpoint_access
- [ ] describe_endpoint_authorization
- [ ] describe_event_categories
- [ ] describe_event_subscriptions
- [ ] describe_events
- [ ] describe_hsm_client_certificates

- [ ] describe_hsm_configurations
- [ ] describe_inbound_integrations
- [ ] describe_logging_status
- [ ] describe_node_configuration_options
- [ ] describe_orderable_cluster_options
- [ ] describe_partners
- [ ] describe_redshift_idc_applications
- [ ] describe_reserved_node_exchange_status
- [ ] describe_reserved_node_offerings
- [ ] describe_reserved_nodes
- [ ] describe_resize
- [ ] describe_scheduled_actions
- [X] describe_snapshot_copy_grants
- [ ] describe_snapshot_schedules
- [ ] describe_storage
- [ ] describe_table_restore_status
- [X] describe_tags
- [ ] describe_usage_limits
- [ ] disable_logging
- [X] disable_snapshot_copy
- [ ] disassociate_data_share_consumer
- [ ] enable_logging
- [X] enable_snapshot_copy
- [ ] failover_primary_compute
- [X] get_cluster_credentials
- [ ] get_cluster_credentials_with_iam
- [ ] get_reserved_node_exchange_configuration_options
- [ ] get_reserved_node_exchange_offerings
- [ ] get_resource_policy
- [ ] list_recommendations
- [ ] modify_aqua_configuration
- [ ] modify_authentication_profile
- [X] modify_cluster
- [ ] modify_cluster_db_revision
- [ ] modify_cluster_iam_roles
- [ ] modify_cluster_maintenance

- [ ] modify_cluster_parameter_group
- [ ] modify_cluster_snapshot
- [ ] modify_cluster_snapshot_schedule
- [ ] modify_cluster_subnet_group
- [ ] modify_custom_domain_association
- [ ] modify_endpoint_access
- [ ] modify_event_subscription
- [ ] modify_redshift_idc_application
- [ ] modify_scheduled_action
- [X] modify_snapshot_copy_retention_period
- [ ] modify_snapshot_schedule
- [ ] modify_usage_limit
- [X] pause_cluster
- [ ] purchase_reserved_node_offering
- [ ] put_resource_policy
- [ ] reboot_cluster
- [ ] reject_data_share
- [ ] reset_cluster_parameter_group
- [ ] resize_cluster
- [X] restore_from_cluster_snapshot
- [ ] restore_table_from_cluster_snapshot
- [X] resume_cluster
- [ ] revoke_cluster_security_group_ingress
- [ ] revoke_endpoint_access
- [ ] revoke_snapshot_access
- [ ] rotate_encryption_key
- [ ] update_partner_status

### 2.10.94 redshift-data

Implemented features for this service

- [ ] batch_execute_statement
- [X] cancel_statement
- [X] describe_statement
- [ ] describe_table
- [X] execute_statement

    Runs an SQL statement Validation of parameters is very limited because there is no redshift integration

- [X] get_statement_result

  Return static statement result StatementResult is the result of the SQL query "sql" passed as parameter when calling "execute_statement" As such, it cannot be mocked

- [ ] list_databases
- [ ] list_schemas
- [ ] list_statements
- [ ] list_tables

### 2.10.95 rekognition

**class** moto.rekognition.models.**RekognitionBackend**(*region_name: str*, *account_id: str*)

Implementation of Rekognition APIs.

Implemented features for this service

- [ ] associate_faces
- [X] compare_faces
- [ ] copy_project_version
- [ ] create_collection
- [ ] create_dataset
- [ ] create_face_liveness_session
- [ ] create_project
- [ ] create_project_version
- [ ] create_stream_processor
- [ ] create_user
- [ ] delete_collection
- [ ] delete_dataset
- [ ] delete_faces
- [ ] delete_project
- [ ] delete_project_policy
- [ ] delete_project_version
- [ ] delete_stream_processor
- [ ] delete_user
- [ ] describe_collection
- [ ] describe_dataset
- [ ] describe_project_versions
- [ ] describe_projects
- [ ] describe_stream_processor
- [ ] detect_custom_labels

- [ ] detect_faces
- [X] detect_labels
- [ ] detect_moderation_labels
- [ ] detect_protective_equipment
- [X] detect_text
- [ ] disassociate_faces
- [ ] distribute_dataset_entries
- [ ] get_celebrity_info
- [ ] get_celebrity_recognition
- [ ] get_content_moderation
- [ ] get_face_detection
- [ ] get_face_liveness_session_results
- [X] get_face_search

  This returns hardcoded values and none of the parameters are taken into account.
- [ ] get_label_detection
- [ ] get_media_analysis_job
- [ ] get_person_tracking
- [ ] get_segment_detection
- [X] get_text_detection

  This returns hardcoded values and none of the parameters are taken into account.
- [ ] index_faces
- [ ] list_collections
- [ ] list_dataset_entries
- [ ] list_dataset_labels
- [ ] list_faces
- [ ] list_media_analysis_jobs
- [ ] list_project_policies
- [ ] list_stream_processors
- [ ] list_tags_for_resource
- [ ] list_users
- [ ] put_project_policy
- [ ] recognize_celebrities
- [ ] search_faces
- [ ] search_faces_by_image
- [ ] search_users
- [ ] search_users_by_image

- [ ] start_celebrity_recognition
- [ ] start_content_moderation
- [ ] start_face_detection
- [X] start_face_search
- [ ] start_label_detection
- [ ] start_media_analysis_job
- [ ] start_person_tracking
- [ ] start_project_version
- [ ] start_segment_detection
- [ ] start_stream_processor
- [X] start_text_detection
- [ ] stop_project_version
- [ ] stop_stream_processor
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_dataset_entries
- [ ] update_stream_processor

### 2.10.96 resiliencehub

Implemented features for this service

- [ ] add_draft_app_version_resource_mappings
- [ ] batch_update_recommendation_status
- [X] create_app

  The ClientToken-parameter is not yet implemented
- [X] create_app_version_app_component
- [X] create_app_version_resource
- [ ] create_recommendation_template
- [X] create_resiliency_policy

  The ClientToken-parameter is not yet implemented
- [ ] delete_app
- [ ] delete_app_assessment
- [ ] delete_app_input_source
- [ ] delete_app_version_app_component
- [ ] delete_app_version_resource
- [ ] delete_recommendation_template
- [ ] delete_resiliency_policy

- [X] describe_app
- [ ] describe_app_assessment
- [ ] describe_app_version
- [ ] describe_app_version_app_component
- [ ] describe_app_version_resource
- [ ] describe_app_version_resources_resolution_status
- [ ] describe_app_version_template
- [ ] describe_draft_app_version_resources_import_status
- [X] describe_resiliency_policy
- [X] import_resources_to_draft_app_version
- [ ] list_alarm_recommendations
- [ ] list_app_assessment_compliance_drifts
- [X] list_app_assessments
- [ ] list_app_component_compliances
- [ ] list_app_component_recommendations
- [ ] list_app_input_sources
- [X] list_app_version_app_components
- [ ] list_app_version_resource_mappings
- [X] list_app_version_resources
- [X] list_app_versions
- [X] list_apps

  The FromAssessmentTime/ToAssessmentTime-parameters are not yet implemented
- [ ] list_recommendation_templates
- [X] list_resiliency_policies
- [ ] list_sop_recommendations
- [ ] list_suggested_resiliency_policies
- [X] list_tags_for_resource
- [ ] list_test_recommendations
- [ ] list_unsupported_app_version_resources
- [X] publish_app_version
- [ ] put_draft_app_version_template
- [ ] remove_draft_app_version_resource_mappings
- [ ] resolve_app_version_resources
- [ ] start_app_assessment
- [X] tag_resource
- [X] untag_resource

- [ ] update_app
- [ ] update_app_version
- [ ] update_app_version_app_component
- [ ] update_app_version_resource
- [ ] update_resiliency_policy

### 2.10.97 resource-groups

Implemented features for this service

- [X] create_group
- [X] delete_group
- [ ] get_account_settings
- [X] get_group
- [X] get_group_configuration
- [ ] get_group_query
- [X] get_tags
- [ ] group_resources
- [ ] list_group_resources
- [X] list_groups

  Pagination or the Filters-parameter is not yet implemented
- [X] put_group_configuration
- [ ] search_resources
- [X] tag
- [ ] ungroup_resources
- [X] untag
- [ ] update_account_settings
- [X] update_group
- [X] update_group_query

### 2.10.98 resourcegroupstaggingapi

Implemented features for this service

- [ ] describe_report_creation
- [ ] get_compliance_summary
- [X] get_resources
- [X] get_tag_keys
- [X] get_tag_values
- [ ] start_report_creation

- [X] tag_resources

    Only DynamoDB, Logs and RDS resources are currently supported

- [ ] untag_resources

### 2.10.99 robomaker

Implemented features for this service

- [ ] batch_delete_worlds
- [ ] batch_describe_simulation_job
- [ ] cancel_deployment_job
- [ ] cancel_simulation_job
- [ ] cancel_simulation_job_batch
- [ ] cancel_world_export_job
- [ ] cancel_world_generation_job
- [ ] create_deployment_job
- [ ] create_fleet
- [ ] create_robot
- [X] create_robot_application

    The tags and environment parameters are not yet implemented

- [ ] create_robot_application_version
- [ ] create_simulation_application
- [ ] create_simulation_application_version
- [ ] create_simulation_job
- [ ] create_world_export_job
- [ ] create_world_generation_job
- [ ] create_world_template
- [ ] delete_fleet
- [ ] delete_robot
- [X] delete_robot_application
- [ ] delete_simulation_application
- [ ] delete_world_template
- [ ] deregister_robot
- [ ] describe_deployment_job
- [ ] describe_fleet
- [ ] describe_robot
- [X] describe_robot_application
- [ ] describe_simulation_application

- [ ] describe_simulation_job
- [ ] describe_simulation_job_batch
- [ ] describe_world
- [ ] describe_world_export_job
- [ ] describe_world_generation_job
- [ ] describe_world_template
- [ ] get_world_template_body
- [ ] list_deployment_jobs
- [ ] list_fleets
- [X] list_robot_applications

  Currently returns all applications - none of the parameters are taken into account
- [ ] list_robots
- [ ] list_simulation_applications
- [ ] list_simulation_job_batches
- [ ] list_simulation_jobs
- [ ] list_tags_for_resource
- [ ] list_world_export_jobs
- [ ] list_world_generation_jobs
- [ ] list_world_templates
- [ ] list_worlds
- [ ] register_robot
- [ ] restart_simulation_job
- [ ] start_simulation_job_batch
- [ ] sync_deployment_job
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_robot_application
- [ ] update_simulation_application
- [ ] update_world_template

### 2.10.100 route53

Implemented features for this service

- [ ] activate_key_signing_key
- [X] associate_vpc_with_hosted_zone
- [ ] change_cidr_collection
- [X] change_resource_record_sets
- [X] change_tags_for_resource
- [ ] create_cidr_collection
- [X] create_health_check
- [X] create_hosted_zone
- [ ] create_key_signing_key
- [X] create_query_logging_config Process the create_query_logging_config request.
- [X] create_reusable_delegation_set
- [ ] create_traffic_policy
- [ ] create_traffic_policy_instance
- [ ] create_traffic_policy_version
- [ ] create_vpc_association_authorization
- [ ] deactivate_key_signing_key
- [ ] delete_cidr_collection
- [X] delete_health_check
- [X] delete_hosted_zone
- [ ] delete_key_signing_key
- [X] delete_query_logging_config Delete query logging config, if it exists.
- [X] delete_reusable_delegation_set
- [ ] delete_traffic_policy
- [ ] delete_traffic_policy_instance
- [ ] delete_vpc_association_authorization
- [ ] disable_hosted_zone_dnssec
- [X] disassociate_vpc_from_hosted_zone
- [ ] enable_hosted_zone_dnssec
- [ ] get_account_limit
- [ ] get_change
- [ ] get_checker_ip_ranges
- [X] get_dnssec
- [ ] get_geo_location
- [X] get_health_check

- [ ] get_health_check_count
- [ ] get_health_check_last_failure_reason
- [X] get_health_check_status
- [X] get_hosted_zone
- [X] get_hosted_zone_count
- [ ] get_hosted_zone_limit
- [X] get_query_logging_config Return query logging config, if it exists.
- [X] get_reusable_delegation_set
- [ ] get_reusable_delegation_set_limit
- [ ] get_traffic_policy
- [ ] get_traffic_policy_instance
- [ ] get_traffic_policy_instance_count
- [ ] list_cidr_blocks
- [ ] list_cidr_collections
- [ ] list_cidr_locations
- [ ] list_geo_locations
- [X] list_health_checks
- [X] list_hosted_zones

  The parameters DelegationSetId and HostedZoneType are not yet implemented
- [X] list_hosted_zones_by_name
- [X] list_hosted_zones_by_vpc

  Pagination is not yet implemented
- [X] list_query_logging_configs Return a list of query logging configs.
- [X] list_resource_record_sets

  The StartRecordIdentifier-parameter is not yet implemented
- [X] list_reusable_delegation_sets

  Pagination is not yet implemented
- [X] list_tags_for_resource
- [ ] list_tags_for_resources
- [ ] list_traffic_policies
- [ ] list_traffic_policy_instances
- [ ] list_traffic_policy_instances_by_hosted_zone
- [ ] list_traffic_policy_instances_by_policy
- [ ] list_traffic_policy_versions
- [ ] list_vpc_association_authorizations
- [ ] test_dns_answer

- [X] update_health_check
- [X] update_hosted_zone_comment
- [ ] update_traffic_policy_comment
- [ ] update_traffic_policy_instance

### 2.10.101 route53domains

**class** moto.route53domains.models.**Route53DomainsBackend**(*region_name: str*, *account_id: str*)
Implementation of Route53Domains APIs.

Implemented features for this service

- [ ] accept_domain_transfer_from_another_aws_account
- [ ] associate_delegation_signer_to_domain
- [ ] cancel_domain_transfer_to_another_aws_account
- [ ] check_domain_availability
- [ ] check_domain_transferability
- [X] delete_domain
- [ ] delete_tags_for_domain
- [ ] disable_domain_auto_renew
- [ ] disable_domain_transfer_lock
- [ ] disassociate_delegation_signer_from_domain
- [ ] enable_domain_auto_renew
- [ ] enable_domain_transfer_lock
- [ ] get_contact_reachability_status
- [ ] get_domain_detail
- [ ] get_domain_suggestions
- [ ] get_operation_detail
- [X] list_domains
- [X] list_operations
- [ ] list_prices
- [ ] list_tags_for_domain
- [ ] push_domain
- [X] register_domain Register a domain
- [ ] reject_domain_transfer_from_another_aws_account
- [ ] renew_domain
- [ ] resend_contact_reachability_email
- [ ] resend_operation_authorization
- [ ] retrieve_domain_auth_code

- [ ] transfer_domain
- [ ] transfer_domain_to_another_aws_account
- [ ] update_domain_contact
- [ ] update_domain_contact_privacy
- [X] update_domain_nameservers
- [ ] update_tags_for_domain
- [ ] view_billing

### 2.10.102 route53resolver

**class** moto.route53resolver.models.**Route53ResolverBackend**(*region_name: str*, *account_id: str*)

Implementation of Route53Resolver APIs.

Implemented features for this service

- [ ] associate_firewall_rule_group
- [X] associate_resolver_endpoint_ip_address
- [ ] associate_resolver_query_log_config
- [X] associate_resolver_rule
- [ ] create_firewall_domain_list
- [ ] create_firewall_rule
- [ ] create_firewall_rule_group
- [ ] create_outpost_resolver
- [X] create_resolver_endpoint

  Return description for a newly created resolver endpoint.

  NOTE: IPv6 IPs are currently not being filtered when calculating the create_resolver_endpoint() IpAddresses.
- [ ] create_resolver_query_log_config
- [X] create_resolver_rule Return description for a newly created resolver rule.
- [ ] delete_firewall_domain_list
- [ ] delete_firewall_rule
- [ ] delete_firewall_rule_group
- [ ] delete_outpost_resolver
- [X] delete_resolver_endpoint
- [ ] delete_resolver_query_log_config
- [X] delete_resolver_rule
- [ ] disassociate_firewall_rule_group
- [X] disassociate_resolver_endpoint_ip_address
- [ ] disassociate_resolver_query_log_config

- [X] disassociate_resolver_rule
- [ ] get_firewall_config
- [ ] get_firewall_domain_list
- [ ] get_firewall_rule_group
- [ ] get_firewall_rule_group_association
- [ ] get_firewall_rule_group_policy
- [ ] get_outpost_resolver
- [ ] get_resolver_config
- [ ] get_resolver_dnssec_config
- [X] get_resolver_endpoint
- [ ] get_resolver_query_log_config
- [ ] get_resolver_query_log_config_association
- [ ] get_resolver_query_log_config_policy
- [X] get_resolver_rule Return info for specified resolver rule.
- [X] get_resolver_rule_association
- [ ] get_resolver_rule_policy
- [ ] import_firewall_domains
- [ ] list_firewall_configs
- [ ] list_firewall_domain_lists
- [ ] list_firewall_domains
- [ ] list_firewall_rule_group_associations
- [ ] list_firewall_rule_groups
- [ ] list_firewall_rules
- [ ] list_outpost_resolvers
- [ ] list_resolver_configs
- [ ] list_resolver_dnssec_configs
- [X] list_resolver_endpoint_ip_addresses
- [X] list_resolver_endpoints
- [ ] list_resolver_query_log_config_associations
- [ ] list_resolver_query_log_configs
- [X] list_resolver_rule_associations
- [X] list_resolver_rules
- [X] list_tags_for_resource
- [ ] put_firewall_rule_group_policy
- [ ] put_resolver_query_log_config_policy
- [ ] put_resolver_rule_policy

- [X] tag_resource
- [X] untag_resource
- [ ] update_firewall_config
- [ ] update_firewall_domains
- [ ] update_firewall_rule
- [ ] update_firewall_rule_group_association
- [ ] update_outpost_resolver
- [ ] update_resolver_config
- [ ] update_resolver_dnssec_config
- [X] update_resolver_endpoint
- [ ] update_resolver_rule

### 2.10.103 s3

**class** moto.s3.models.**S3Backend**(*region_name: str*, *account_id: str*)

Custom S3 endpoints are supported, if you are using a S3-compatible storage solution like Ceph. Example usage:

```
os.environ["MOTO_S3_CUSTOM_ENDPOINTS"] = "http://custom.internal.endpoint,http://
↪custom.other.endpoint"

@mock_aws
def test_my_custom_endpoint():
    boto3.client("s3", endpoint_url="http://custom.internal.endpoint")
    ...
```

Note that this only works if the environment variable is set **before** the mock is initialized.

_-_-_-_

When using the MultiPart-API manually, the minimum part size is 5MB, just as with AWS. Use the following environment variable to lower this:

```
S3_UPLOAD_PART_MIN_SIZE=256
```

_-_-_-_

CrossAccount access is allowed by default. If you want Moto to throw an AccessDenied-error when accessing a bucket in another account, use this environment variable:

```
MOTO_S3_ALLOW_CROSSACCOUNT_ACCESS=false
```

_-_-_-_

Install *moto[s3crc32c]* if you use the CRC32C algorithm, and absolutely need the correct value. Alternatively, you can install the *crc32c* dependency manually.

If this dependency is not installed, Moto will fall-back to the CRC32-computation when computing checksums.

Implemented features for this service

- [X] abort_multipart_upload

- [X] complete_multipart_upload
- [X] copy_object
- [X] create_bucket
- [X] create_multipart_upload
- [ ] create_session
- [X] delete_bucket
- [ ] delete_bucket_analytics_configuration
- [X] delete_bucket_cors
- [X] delete_bucket_encryption
- [ ] delete_bucket_intelligent_tiering_configuration
- [ ] delete_bucket_inventory_configuration
- [X] delete_bucket_lifecycle
- [ ] delete_bucket_metrics_configuration
- [X] delete_bucket_ownership_controls
- [X] delete_bucket_policy
- [X] delete_bucket_replication
- [X] delete_bucket_tagging
- [X] delete_bucket_website
- [X] delete_object
- [X] delete_object_tagging
- [X] delete_objects
- [X] delete_public_access_block
- [ ] get_bucket_accelerate_configuration
- [X] get_bucket_acl
- [ ] get_bucket_analytics_configuration
- [X] get_bucket_cors
- [X] get_bucket_encryption
- [ ] get_bucket_intelligent_tiering_configuration
- [ ] get_bucket_inventory_configuration
- [X] get_bucket_lifecycle
- [ ] get_bucket_lifecycle_configuration
- [X] get_bucket_location
- [X] get_bucket_logging
- [ ] get_bucket_metrics_configuration
- [ ] get_bucket_notification
- [X] get_bucket_notification_configuration

- [X] get_bucket_ownership_controls
- [X] get_bucket_policy
- [ ] get_bucket_policy_status
- [X] get_bucket_replication
- [ ] get_bucket_request_payment
- [X] get_bucket_tagging
- [X] get_bucket_versioning
- [ ] get_bucket_website
- [X] get_object
- [X] get_object_acl
- [X] get_object_attributes

  The following attributes are not yet returned: DeleteMarker, RequestCharged, ObjectParts
- [X] get_object_legal_hold
- [X] get_object_lock_configuration
- [ ] get_object_retention
- [X] get_object_tagging
- [ ] get_object_torrent
- [X] get_public_access_block
- [X] head_bucket
- [X] head_object
- [ ] list_bucket_analytics_configurations
- [ ] list_bucket_intelligent_tiering_configurations
- [ ] list_bucket_inventory_configurations
- [ ] list_bucket_metrics_configurations
- [X] list_buckets
- [ ] list_directory_buckets
- [ ] list_multipart_uploads
- [X] list_object_versions
- [X] list_objects
- [X] list_objects_v2
- [X] list_parts
- [X] put_bucket_accelerate_configuration
- [X] put_bucket_acl
- [ ] put_bucket_analytics_configuration
- [X] put_bucket_cors
- [X] put_bucket_encryption

- [ ] put_bucket_intelligent_tiering_configuration
- [ ] put_bucket_inventory_configuration
- [X] put_bucket_lifecycle
- [ ] put_bucket_lifecycle_configuration
- [X] put_bucket_logging
- [ ] put_bucket_metrics_configuration
- [ ] put_bucket_notification
- [X] put_bucket_notification_configuration

  The configuration can be persisted, but at the moment we only send notifications to the following targets:

  - AWSLambda
  - SNS
  - SQS
  - EventBridge

  **For the following events:**

  - 's3:ObjectCreated:CompleteMultipartUpload'
  - 's3:ObjectCreated:Copy'
  - 's3:ObjectCreated:Post'
  - 's3:ObjectCreated:Put'
  - 's3:ObjectDeleted'
  - 's3:ObjectRestore:Post'
- [X] put_bucket_ownership_controls
- [X] put_bucket_policy

  Basic policy enforcement is in place.

  **Restrictions:**

  - Only statements with principal=* are taken into account
  - Conditions are not taken into account
- [X] put_bucket_replication
- [ ] put_bucket_request_payment
- [X] put_bucket_tagging
- [X] put_bucket_versioning
- [ ] put_bucket_website
- [X] put_object
- [X] put_object_acl
- [X] put_object_legal_hold
- [X] put_object_lock_configuration

- [X] put_object_retention
- [X] put_object_tagging
- [X] put_public_access_block
- [X] restore_object
- [X] select_object_content

  Highly experimental. Please raise an issue if you find any inconsistencies/bugs.

  **Known missing features:**

  - Function aliases (count(*) as cnt)
  - Most functions (only count() is supported)
  - Result is always in JSON
  - FieldDelimiters are ignored
- [X] upload_file
- [X] upload_fileobj
- [X] upload_part
- [X] upload_part_copy
- [ ] write_get_object_response

### 2.10.104 s3control

Implemented features for this service

- [ ] associate_access_grants_identity_center
- [ ] create_access_grant
- [ ] create_access_grants_instance
- [ ] create_access_grants_location
- [X] create_access_point
- [ ] create_access_point_for_object_lambda
- [ ] create_bucket
- [ ] create_job
- [ ] create_multi_region_access_point
- [ ] create_storage_lens_group
- [ ] delete_access_grant
- [ ] delete_access_grants_instance
- [ ] delete_access_grants_instance_resource_policy
- [ ] delete_access_grants_location
- [X] delete_access_point
- [ ] delete_access_point_for_object_lambda
- [X] delete_access_point_policy

- [ ] delete_access_point_policy_for_object_lambda
- [ ] delete_bucket
- [ ] delete_bucket_lifecycle_configuration
- [ ] delete_bucket_policy
- [ ] delete_bucket_replication
- [ ] delete_bucket_tagging
- [ ] delete_job_tagging
- [ ] delete_multi_region_access_point
- [X] delete_public_access_block
- [ ] delete_storage_lens_configuration
- [ ] delete_storage_lens_configuration_tagging
- [ ] delete_storage_lens_group
- [ ] describe_job
- [ ] describe_multi_region_access_point_operation
- [ ] dissociate_access_grants_identity_center
- [ ] get_access_grant
- [ ] get_access_grants_instance
- [ ] get_access_grants_instance_for_prefix
- [ ] get_access_grants_instance_resource_policy
- [ ] get_access_grants_location
- [X] get_access_point
- [ ] get_access_point_configuration_for_object_lambda
- [ ] get_access_point_for_object_lambda
- [X] get_access_point_policy
- [ ] get_access_point_policy_for_object_lambda
- [X] get_access_point_policy_status

  We assume the policy status is always public
- [ ] get_access_point_policy_status_for_object_lambda
- [ ] get_bucket
- [ ] get_bucket_lifecycle_configuration
- [ ] get_bucket_policy
- [ ] get_bucket_replication
- [ ] get_bucket_tagging
- [ ] get_bucket_versioning
- [ ] get_data_access
- [ ] get_job_tagging

- [ ] get_multi_region_access_point
- [ ] get_multi_region_access_point_policy
- [ ] get_multi_region_access_point_policy_status
- [ ] get_multi_region_access_point_routes
- [X] get_public_access_block
- [ ] get_storage_lens_configuration
- [ ] get_storage_lens_configuration_tagging
- [ ] get_storage_lens_group
- [ ] list_access_grants
- [ ] list_access_grants_instances
- [ ] list_access_grants_locations
- [ ] list_access_points
- [ ] list_access_points_for_object_lambda
- [ ] list_jobs
- [ ] list_multi_region_access_points
- [ ] list_regional_buckets
- [ ] list_storage_lens_configurations
- [ ] list_storage_lens_groups
- [ ] list_tags_for_resource
- [ ] put_access_grants_instance_resource_policy
- [ ] put_access_point_configuration_for_object_lambda
- [ ] put_access_point_policy
- [ ] put_access_point_policy_for_object_lambda
- [ ] put_bucket_lifecycle_configuration
- [ ] put_bucket_policy
- [ ] put_bucket_replication
- [ ] put_bucket_tagging
- [ ] put_bucket_versioning
- [ ] put_job_tagging
- [ ] put_multi_region_access_point_policy
- [X] put_public_access_block
- [ ] put_storage_lens_configuration
- [ ] put_storage_lens_configuration_tagging
- [ ] submit_multi_region_access_point_routes
- [ ] tag_resource
- [ ] untag_resource

- [ ] update_access_grants_location
- [ ] update_job_priority
- [ ] update_job_status
- [ ] update_storage_lens_group

### 2.10.105 sagemaker

Implemented features for this service

- [ ] add_association
- [X] add_tags
- [X] associate_trial_component
- [ ] batch_describe_model_package
- [ ] create_action
- [ ] create_algorithm
- [ ] create_app
- [ ] create_app_image_config
- [ ] create_artifact
- [ ] create_auto_ml_job
- [ ] create_auto_ml_job_v2
- [ ] create_cluster
- [ ] create_code_repository
- [ ] create_compilation_job
- [ ] create_context
- [ ] create_data_quality_job_definition
- [ ] create_device_fleet
- [ ] create_domain
- [ ] create_edge_deployment_plan
- [ ] create_edge_deployment_stage
- [ ] create_edge_packaging_job
- [X] create_endpoint
- [X] create_endpoint_config
- [X] create_experiment
- [X] create_feature_group
- [ ] create_flow_definition
- [ ] create_hub
- [ ] create_human_task_ui
- [ ] create_hyper_parameter_tuning_job

- [ ] create_image
- [ ] create_image_version
- [ ] create_inference_component
- [ ] create_inference_experiment
- [ ] create_inference_recommendations_job
- [ ] create_labeling_job
- [X] create_model
- [ ] create_model_bias_job_definition
- [ ] create_model_card
- [ ] create_model_card_export_job
- [ ] create_model_explainability_job_definition
- [X] create_model_package
- [X] create_model_package_group
- [ ] create_model_quality_job_definition
- [ ] create_monitoring_schedule
- [X] create_notebook_instance
- [X] create_notebook_instance_lifecycle_config
- [X] create_pipeline
- [ ] create_presigned_domain_url
- [ ] create_presigned_notebook_instance_url
- [X] create_processing_job
- [ ] create_project
- [ ] create_space
- [ ] create_studio_lifecycle_config
- [X] create_training_job
- [X] create_transform_job
- [X] create_trial
- [X] create_trial_component
- [ ] create_user_profile
- [ ] create_workforce
- [ ] create_workteam
- [ ] delete_action
- [ ] delete_algorithm
- [ ] delete_app
- [ ] delete_app_image_config
- [ ] delete_artifact

- [ ] delete_association
- [ ] delete_cluster
- [ ] delete_code_repository
- [ ] delete_compilation_job
- [ ] delete_context
- [ ] delete_data_quality_job_definition
- [ ] delete_device_fleet
- [ ] delete_domain
- [ ] delete_edge_deployment_plan
- [ ] delete_edge_deployment_stage
- [X] delete_endpoint
- [X] delete_endpoint_config
- [X] delete_experiment
- [ ] delete_feature_group
- [ ] delete_flow_definition
- [ ] delete_hub
- [ ] delete_hub_content
- [ ] delete_human_task_ui
- [ ] delete_hyper_parameter_tuning_job
- [ ] delete_image
- [ ] delete_image_version
- [ ] delete_inference_component
- [ ] delete_inference_experiment
- [X] delete_model
- [ ] delete_model_bias_job_definition
- [ ] delete_model_card
- [ ] delete_model_explainability_job_definition
- [ ] delete_model_package
- [ ] delete_model_package_group
- [ ] delete_model_package_group_policy
- [ ] delete_model_quality_job_definition
- [ ] delete_monitoring_schedule
- [X] delete_notebook_instance
- [X] delete_notebook_instance_lifecycle_config
- [X] delete_pipeline
- [ ] delete_project

- [ ] delete_space
- [ ] delete_studio_lifecycle_config
- [X] delete_tags
- [X] delete_trial
- [X] delete_trial_component
- [ ] delete_user_profile
- [ ] delete_workforce
- [ ] delete_workteam
- [ ] deregister_devices
- [ ] describe_action
- [ ] describe_algorithm
- [ ] describe_app
- [ ] describe_app_image_config
- [ ] describe_artifact
- [ ] describe_auto_ml_job
- [ ] describe_auto_ml_job_v2
- [ ] describe_cluster
- [ ] describe_cluster_node
- [ ] describe_code_repository
- [ ] describe_compilation_job
- [ ] describe_context
- [ ] describe_data_quality_job_definition
- [ ] describe_device
- [ ] describe_device_fleet
- [ ] describe_domain
- [ ] describe_edge_deployment_plan
- [ ] describe_edge_packaging_job
- [X] describe_endpoint
- [X] describe_endpoint_config
- [X] describe_experiment
- [X] describe_feature_group
- [ ] describe_feature_metadata
- [ ] describe_flow_definition
- [ ] describe_hub
- [ ] describe_hub_content
- [ ] describe_human_task_ui

- [ ] describe_hyper_parameter_tuning_job
- [ ] describe_image
- [ ] describe_image_version
- [ ] describe_inference_component
- [ ] describe_inference_experiment
- [ ] describe_inference_recommendations_job
- [ ] describe_labeling_job
- [ ] describe_lineage_group
- [X] describe_model
- [ ] describe_model_bias_job_definition
- [ ] describe_model_card
- [ ] describe_model_card_export_job
- [ ] describe_model_explainability_job_definition
- [X] describe_model_package
- [X] describe_model_package_group
- [ ] describe_model_quality_job_definition
- [ ] describe_monitoring_schedule
- [ ] describe_notebook_instance
- [X] describe_notebook_instance_lifecycle_config
- [X] describe_pipeline
- [X] describe_pipeline_definition_for_execution
- [X] describe_pipeline_execution
- [X] describe_processing_job
- [ ] describe_project
- [ ] describe_space
- [ ] describe_studio_lifecycle_config
- [ ] describe_subscribed_workteam
- [X] describe_training_job
- [X] describe_transform_job
- [X] describe_trial
- [X] describe_trial_component
- [ ] describe_user_profile
- [ ] describe_workforce
- [ ] describe_workteam
- [ ] disable_sagemaker_servicecatalog_portfolio
- [X] disassociate_trial_component

- [ ] enable_sagemaker_servicecatalog_portfolio
- [ ] get_device_fleet_report
- [ ] get_lineage_group_policy
- [ ] get_model_package_group_policy
- [ ] get_sagemaker_servicecatalog_portfolio_status
- [ ] get_scaling_configuration_recommendation
- [ ] get_search_suggestions
- [ ] import_hub_content
- [ ] list_actions
- [ ] list_algorithms
- [ ] list_aliases
- [ ] list_app_image_configs
- [ ] list_apps
- [ ] list_artifacts
- [ ] list_associations
- [ ] list_auto_ml_jobs
- [ ] list_candidates_for_auto_ml_job
- [ ] list_cluster_nodes
- [ ] list_clusters
- [ ] list_code_repositories
- [ ] list_compilation_jobs
- [ ] list_contexts
- [ ] list_data_quality_job_definitions
- [ ] list_device_fleets
- [ ] list_devices
- [ ] list_domains
- [ ] list_edge_deployment_plans
- [ ] list_edge_packaging_jobs
- [ ] list_endpoint_configs
- [ ] list_endpoints
- [X] list_experiments
- [ ] list_feature_groups
- [ ] list_flow_definitions
- [ ] list_hub_content_versions
- [ ] list_hub_contents
- [ ] list_hubs

- [ ] list_human_task_uis
- [ ] list_hyper_parameter_tuning_jobs
- [ ] list_image_versions
- [ ] list_images
- [ ] list_inference_components
- [ ] list_inference_experiments
- [ ] list_inference_recommendations_job_steps
- [ ] list_inference_recommendations_jobs
- [ ] list_labeling_jobs
- [ ] list_labeling_jobs_for_workteam
- [ ] list_lineage_groups
- [ ] list_model_bias_job_definitions
- [ ] list_model_card_export_jobs
- [ ] list_model_card_versions
- [ ] list_model_cards
- [ ] list_model_explainability_job_definitions
- [ ] list_model_metadata
- [X] list_model_package_groups
- [X] list_model_packages
- [ ] list_model_quality_job_definitions
- [X] list_models
- [ ] list_monitoring_alert_history
- [ ] list_monitoring_alerts
- [ ] list_monitoring_executions
- [ ] list_monitoring_schedules
- [ ] list_notebook_instance_lifecycle_configs
- [X] list_notebook_instances

  The following parameters are not yet implemented: CreationTimeBefore, CreationTimeAfter, LastModifiedTimeBefore, LastModifiedTimeAfter, NotebookInstanceLifecycleConfigNameContains, DefaultCodeRepositoryContains, AdditionalCodeRepositoryEquals

- [ ] list_pipeline_execution_steps
- [X] list_pipeline_executions
- [X] list_pipeline_parameters_for_execution
- [X] list_pipelines
- [X] list_processing_jobs
- [ ] list_projects
- [ ] list_resource_catalogs

- [ ] list_spaces
- [ ] list_stage_devices
- [ ] list_studio_lifecycle_configs
- [ ] list_subscribed_workteams
- [X] list_tags
- [X] list_training_jobs
- [ ] list_training_jobs_for_hyper_parameter_tuning_job
- [X] list_transform_jobs
- [X] list_trial_components
- [X] list_trials
- [ ] list_user_profiles
- [ ] list_workforces
- [ ] list_workteams
- [ ] put_model_package_group_policy
- [ ] query_lineage
- [ ] register_devices
- [ ] render_ui_template
- [ ] retry_pipeline_execution
- [X] search
- [ ] send_pipeline_execution_step_failure
- [ ] send_pipeline_execution_step_success
- [ ] start_edge_deployment_stage
- [ ] start_inference_experiment
- [ ] start_monitoring_schedule
- [X] start_notebook_instance
- [X] start_pipeline_execution
- [ ] stop_auto_ml_job
- [ ] stop_compilation_job
- [ ] stop_edge_deployment_stage
- [ ] stop_edge_packaging_job
- [ ] stop_hyper_parameter_tuning_job
- [ ] stop_inference_experiment
- [ ] stop_inference_recommendations_job
- [ ] stop_labeling_job
- [ ] stop_monitoring_schedule
- [X] stop_notebook_instance

- [ ] stop_pipeline_execution
- [ ] stop_processing_job
- [ ] stop_training_job
- [ ] stop_transform_job
- [ ] update_action
- [ ] update_app_image_config
- [ ] update_artifact
- [ ] update_cluster
- [ ] update_cluster_software
- [ ] update_code_repository
- [ ] update_context
- [ ] update_device_fleet
- [ ] update_devices
- [ ] update_domain
- [ ] update_endpoint
- [X] update_endpoint_weights_and_capacities
- [ ] update_experiment
- [ ] update_feature_group
- [ ] update_feature_metadata
- [ ] update_hub
- [ ] update_image
- [ ] update_image_version
- [ ] update_inference_component
- [ ] update_inference_component_runtime_config
- [ ] update_inference_experiment
- [ ] update_model_card
- [X] update_model_package
- [ ] update_monitoring_alert
- [ ] update_monitoring_schedule
- [ ] update_notebook_instance
- [ ] update_notebook_instance_lifecycle_config
- [X] update_pipeline
- [ ] update_pipeline_execution
- [ ] update_project
- [ ] update_space
- [ ] update_training_job

- [ ] update_trial
- [ ] update_trial_component
- [ ] update_user_profile
- [ ] update_workforce
- [ ] update_workteam

### 2.10.106 sagemaker-runtime

**class** moto.sagemakerruntime.models.**SageMakerRuntimeBackend**(*region_name: str*, *account_id: str*)

Implementation of SageMakerRuntime APIs.

Implemented features for this service

- [X] invoke_endpoint

  This call will return static data by default.

  You can use a dedicated API to override this, by configuring a queue of expected results.

  A request to *get_query_results* will take the first result from that queue. Subsequent requests using the same details will return the same result. Other requests using a different QueryExecutionId will take the next result from the queue, or return static data if the queue is empty.

  Configuring this queue by making an HTTP request to */moto-api/static/sagemaker/endpoint-results*. An example invocation looks like this:

```
expected_results = {
    "account_id": "123456789012",  # This is the default - can be omitted
    "region": "us-east-1",  # This is the default - can be omitted
    "results": [
        {
             "Body": "first body",
             "ContentType": "text/xml",
             "InvokedProductionVariant": "prod",
             "CustomAttributes": "my_attr",
         },
        # other results as required
    ],
}
requests.post(
    "http://motoapi.amazonaws.com/moto-api/static/sagemaker/endpoint-results
↪",
    json=expected_results,
)

client = boto3.client("sagemaker", region_name="us-east-1")
details = client.invoke_endpoint(EndpointName="asdf", Body="qwer")
```

- [X] invoke_endpoint_async
- [ ] invoke_endpoint_with_response_stream

### 2.10.107 scheduler

**class** moto.scheduler.models.**EventBridgeSchedulerBackend**(*region_name: str*, *account_id: str*)

Implementation of EventBridgeScheduler APIs.

Implemented features for this service

- [X] create_schedule

  The ClientToken parameter is not yet implemented

- [X] create_schedule_group

  The ClientToken parameter is not yet implemented

- [X] delete_schedule
- [X] delete_schedule_group
- [X] get_schedule
- [X] get_schedule_group
- [X] list_schedule_groups

  The MaxResults-parameter and pagination options are not yet implemented

- [X] list_schedules

  The following parameters are not yet implemented: MaxResults, NamePrefix, NextToken

- [X] list_tags_for_resource
- [X] tag_resource
- [X] untag_resource
- [X] update_schedule

  The ClientToken is not yet implemented

### 2.10.108 sdb

Implemented features for this service

- [ ] batch_delete_attributes
- [ ] batch_put_attributes
- [X] create_domain
- [ ] delete_attributes
- [X] delete_domain
- [ ] domain_metadata
- [X] get_attributes

  Behaviour for the consistent_read-attribute is not yet implemented

- [X] list_domains

  The *max_number_of_domains* and *next_token* parameter have not been implemented yet - we simply return all domains.

- [X] put_attributes

Behaviour for the expected-attribute is not yet implemented.

- [ ] select

### 2.10.109 secretsmanager

Implemented features for this service

- [X] batch_get_secret_value
- [X] cancel_rotate_secret
- [X] create_secret
- [X] delete_resource_policy
- [X] delete_secret
- [X] describe_secret
- [X] get_random_password
- [X] get_resource_policy
- [X] get_secret_value
- [X] list_secret_version_ids
- [X] list_secrets
- [X] put_resource_policy

  The BlockPublicPolicy-parameter is not yet implemented
- [X] put_secret_value
- [X] remove_regions_from_replication
- [X] replicate_secret_to_regions
- [X] restore_secret
- [X] rotate_secret
- [ ] stop_replication_to_replica
- [X] tag_resource
- [X] untag_resource
- [X] update_secret
- [X] update_secret_version_stage
- [ ] validate_resource_policy

### 2.10.110 service-quotas

class moto.servicequotas.models.**ServiceQuotasBackend**(*region_name: str*, *account_id: str*)

Implementation of ServiceQuotas APIs.

Implemented features for this service

- [ ] associate_service_quota_template
- [ ] delete_service_quota_increase_request_from_template
- [ ] disassociate_service_quota_template
- [ ] get_association_for_service_quota_template
- [ ] get_aws_default_service_quota
- [ ] get_requested_service_quota_change
- [X] get_service_quota
- [ ] get_service_quota_increase_request_from_template
- [X] list_aws_default_service_quotas

  The ServiceCodes that are currently implemented are: vpc Pagination is not yet implemented.
- [ ] list_requested_service_quota_change_history
- [ ] list_requested_service_quota_change_history_by_quota
- [ ] list_service_quota_increase_requests_in_template
- [ ] list_service_quotas
- [ ] list_services
- [ ] list_tags_for_resource
- [ ] put_service_quota_increase_request_into_template
- [ ] request_service_quota_increase
- [ ] tag_resource
- [ ] untag_resource

### 2.10.111 servicediscovery

class moto.servicediscovery.models.**ServiceDiscoveryBackend**(*region_name: str*, *account_id: str*)

Implementation of ServiceDiscovery APIs.

Implemented features for this service

- [X] create_http_namespace
- [X] create_private_dns_namespace
- [X] create_public_dns_namespace
- [X] create_service
- [X] delete_namespace
- [X] delete_service
- [ ] deregister_instance

- [ ] discover_instances
- [ ] discover_instances_revision
- [ ] get_instance
- [ ] get_instances_health_status
- [X] get_namespace
- [X] get_operation
- [X] get_service
- [ ] list_instances
- [X] list_namespaces

  Pagination or the Filters-parameter is not yet implemented
- [X] list_operations

  Pagination or the Filters-argument is not yet implemented
- [X] list_services

  Pagination or the Filters-argument is not yet implemented
- [X] list_tags_for_resource
- [ ] register_instance
- [X] tag_resource
- [X] untag_resource
- [ ] update_http_namespace
- [ ] update_instance_custom_health_status
- [X] update_private_dns_namespace
- [X] update_public_dns_namespace
- [X] update_service

### 2.10.112 ses

**class** moto.ses.models.**SESBackend**(*region_name: str*, *account_id: str*)

Responsible for mocking calls to SES.

Sent messages are persisted in the backend. If you need to verify that a message was sent successfully, you can use the internal API to check:

```
from moto.core import DEFAULT_ACCOUNT_ID
from moto.ses import ses_backends
ses_backend = ses_backends[DEFAULT_ACCOUNT_ID][region]
messages = ses_backend.sent_messages # sent_messages is a List of Message objects
```

Note that, as this is an internal API, the exact format may differ per versions.

Implemented features for this service

- [ ] clone_receipt_rule_set
- [X] create_configuration_set

- [X] create_configuration_set_event_destination
- [ ] create_configuration_set_tracking_options
- [ ] create_custom_verification_email_template
- [ ] create_receipt_filter
- [X] create_receipt_rule
- [X] create_receipt_rule_set
- [ ] create_template
- [ ] delete_configuration_set
- [ ] delete_configuration_set_event_destination
- [ ] delete_configuration_set_tracking_options
- [ ] delete_custom_verification_email_template
- [X] delete_identity
- [ ] delete_identity_policy
- [ ] delete_receipt_filter
- [ ] delete_receipt_rule
- [ ] delete_receipt_rule_set
- [X] delete_template
- [ ] delete_verified_email_address
- [ ] describe_active_receipt_rule_set
- [X] describe_configuration_set
- [X] describe_receipt_rule
- [X] describe_receipt_rule_set
- [ ] get_account_sending_enabled
- [ ] get_custom_verification_email_template
- [ ] get_identity_dkim_attributes
- [X] get_identity_mail_from_domain_attributes
- [X] get_identity_notification_attributes
- [ ] get_identity_policies
- [X] get_identity_verification_attributes
- [X] get_send_quota
- [X] get_send_statistics
- [X] get_template
- [ ] list_configuration_sets
- [ ] list_custom_verification_email_templates
- [X] list_identities
- [ ] list_identity_policies

- [ ] list_receipt_filters
- [ ] list_receipt_rule_sets
- [X] list_templates
- [X] list_verified_email_addresses
- [ ] put_configuration_set_delivery_options
- [ ] put_identity_policy
- [ ] reorder_receipt_rule_set
- [ ] send_bounce
- [X] send_bulk_templated_email
- [ ] send_custom_verification_email
- [X] send_email
- [X] send_raw_email
- [X] send_templated_email
- [ ] set_active_receipt_rule_set
- [ ] set_identity_dkim_enabled
- [X] set_identity_feedback_forwarding_enabled
- [ ] set_identity_headers_in_notifications_enabled
- [X] set_identity_mail_from_domain
- [X] set_identity_notification_topic
- [ ] set_receipt_rule_position
- [ ] test_render_template
- [ ] update_account_sending_enabled
- [ ] update_configuration_set_event_destination
- [ ] update_configuration_set_reputation_metrics_enabled
- [ ] update_configuration_set_sending_enabled
- [ ] update_configuration_set_tracking_options
- [ ] update_custom_verification_email_template
- [X] update_receipt_rule
- [X] update_template
- [ ] verify_domain_dkim
- [ ] verify_domain_identity
- [X] verify_email_address
- [X] verify_email_identity

### 2.10.113 sesv2

**class** moto.sesv2.models.**SESV2Backend**(*region_name: str*, *account_id: str*)

Implementation of SESV2 APIs, piggy back on v1 SES

Implemented features for this service

- [ ] batch_get_metric_data
- [ ] cancel_export_job
- [ ] create_configuration_set
- [ ] create_configuration_set_event_destination
- [X] create_contact
- [X] create_contact_list
- [ ] create_custom_verification_email_template
- [ ] create_dedicated_ip_pool
- [ ] create_deliverability_test_report
- [ ] create_email_identity
- [ ] create_email_identity_policy
- [ ] create_email_template
- [ ] create_export_job
- [ ] create_import_job
- [ ] delete_configuration_set
- [ ] delete_configuration_set_event_destination
- [X] delete_contact
- [X] delete_contact_list
- [ ] delete_custom_verification_email_template
- [ ] delete_dedicated_ip_pool
- [ ] delete_email_identity
- [ ] delete_email_identity_policy
- [ ] delete_email_template
- [ ] delete_suppressed_destination
- [ ] get_account
- [ ] get_blacklist_reports
- [ ] get_configuration_set
- [ ] get_configuration_set_event_destinations
- [X] get_contact
- [X] get_contact_list
- [ ] get_custom_verification_email_template
- [ ] get_dedicated_ip

- [ ] get_dedicated_ip_pool
- [ ] get_dedicated_ips
- [ ] get_deliverability_dashboard_options
- [ ] get_deliverability_test_report
- [ ] get_domain_deliverability_campaign
- [ ] get_domain_statistics_report
- [ ] get_email_identity
- [ ] get_email_identity_policies
- [ ] get_email_template
- [ ] get_export_job
- [ ] get_import_job
- [ ] get_message_insights
- [ ] get_suppressed_destination
- [ ] list_configuration_sets
- [X] list_contact_lists
- [X] list_contacts
- [ ] list_custom_verification_email_templates
- [ ] list_dedicated_ip_pools
- [ ] list_deliverability_test_reports
- [ ] list_domain_deliverability_campaigns
- [ ] list_email_identities
- [ ] list_email_templates
- [ ] list_export_jobs
- [ ] list_import_jobs
- [ ] list_recommendations
- [ ] list_suppressed_destinations
- [ ] list_tags_for_resource
- [ ] put_account_dedicated_ip_warmup_attributes
- [ ] put_account_details
- [ ] put_account_sending_attributes
- [ ] put_account_suppression_attributes
- [ ] put_account_vdm_attributes
- [ ] put_configuration_set_delivery_options
- [ ] put_configuration_set_reputation_options
- [ ] put_configuration_set_sending_options
- [ ] put_configuration_set_suppression_options

- [ ] put_configuration_set_tracking_options
- [ ] put_configuration_set_vdm_options
- [ ] put_dedicated_ip_in_pool
- [ ] put_dedicated_ip_pool_scaling_attributes
- [ ] put_dedicated_ip_warmup_attributes
- [ ] put_deliverability_dashboard_option
- [ ] put_email_identity_configuration_set_attributes
- [ ] put_email_identity_dkim_attributes
- [ ] put_email_identity_dkim_signing_attributes
- [ ] put_email_identity_feedback_attributes
- [ ] put_email_identity_mail_from_attributes
- [ ] put_suppressed_destination
- [ ] send_bulk_email
- [ ] send_custom_verification_email
- [X] send_email
- [ ] tag_resource
- [ ] test_render_email_template
- [ ] untag_resource
- [ ] update_configuration_set_event_destination
- [ ] update_contact
- [ ] update_contact_list
- [ ] update_custom_verification_email_template
- [ ] update_email_identity_policy
- [ ] update_email_template

### 2.10.114 signer

**class** moto.signer.models.**SignerBackend**(*region_name: str*, *account_id: str*)

Implementation of signer APIs.

Implemented features for this service

- [ ] add_profile_permission
- [X] cancel_signing_profile
- [ ] describe_signing_job
- [ ] get_revocation_status
- [ ] get_signing_platform
- [X] get_signing_profile
- [ ] list_profile_permissions

- [ ] list_signing_jobs
- [X] list_signing_platforms

  Pagination is not yet implemented. The parameters category, partner, target are not yet implemented
- [ ] list_signing_profiles
- [X] list_tags_for_resource
- [X] put_signing_profile

  The following parameters are not yet implemented: Overrides, SigningParameters
- [ ] remove_profile_permission
- [ ] revoke_signature
- [ ] revoke_signing_profile
- [ ] sign_payload
- [ ] start_signing_job
- [X] tag_resource
- [X] untag_resource

### 2.10.115 sns

**class** moto.sns.models.**SNSBackend**(*region_name: str*, *account_id: str*)

Responsible for mocking calls to SNS. Integration with SQS/HTTP/etc is supported.

Messages published to a topic are persisted in the backend. If you need to verify that a message was published successfully, you can use the internal API to check the message was published successfully:

```
from moto.core import DEFAULT_ACCOUNT_ID
from moto.sns import sns_backends
sns_backend = sns_backends[DEFAULT_ACCOUNT_ID]["us-east-1"]  # Use the appropriate␣
↪account/region
all_send_notifications = sns_backend.topics[topic_arn].sent_notifications
```

Note that, as this is an internal API, the exact format may differ per versions.

Implemented features for this service

- [X] add_permission
- [X] check_if_phone_number_is_opted_out

  Current implementation returns True for all numbers ending in '99'
- [X] confirm_subscription
- [X] create_platform_application
- [X] create_platform_endpoint
- [ ] create_sms_sandbox_phone_number
- [X] create_topic
- [X] delete_endpoint
- [X] delete_platform_application

- [ ] delete_sms_sandbox_phone_number
- [X] delete_topic
- [ ] get_data_protection_policy
- [X] get_endpoint_attributes
- [X] get_platform_application_attributes
- [X] get_sms_attributes
- [ ] get_sms_sandbox_account_status
- [X] get_subscription_attributes
- [X] get_topic_attributes
- [X] list_endpoints_by_platform_application
- [ ] list_origination_numbers
- [X] list_phone_numbers_opted_out
- [X] list_platform_applications
- [ ] list_sms_sandbox_phone_numbers
- [X] list_subscriptions
- [X] list_subscriptions_by_topic
- [X] list_tags_for_resource
- [X] list_topics
- [X] opt_in_phone_number
- [X] publish
- [X] publish_batch

  The MessageStructure and MessageDeduplicationId-parameters have not yet been implemented.
- [ ] put_data_protection_policy
- [X] remove_permission
- [X] set_endpoint_attributes
- [X] set_platform_application_attributes
- [X] set_sms_attributes
- [X] set_subscription_attributes
- [ ] set_topic_attributes
- [X] subscribe
- [X] tag_resource
- [X] unsubscribe
- [X] untag_resource
- [ ] verify_sms_sandbox_phone_number

### 2.10.116 sqs

Implemented features for this service

- [X] add_permission
- [ ] cancel_message_move_task
- [X] change_message_visibility
- [X] change_message_visibility_batch
- [X] create_queue
- [X] delete_message
- [X] delete_message_batch
- [X] delete_queue
- [X] get_queue_attributes
- [X] get_queue_url
- [X] list_dead_letter_source_queues
- [ ] list_message_move_tasks
- [X] list_queue_tags
- [X] list_queues
- [X] purge_queue
- [X] receive_message
- [X] remove_permission
- [X] send_message
- [X] send_message_batch
- [X] set_queue_attributes
- [ ] start_message_move_task
- [X] tag_queue
- [X] untag_queue

### 2.10.117 ssm

**class** moto.ssm.models.**SimpleSystemManagerBackend**(*region_name: str*, *account_id: str*)

Moto supports the following default parameters out of the box:

- /aws/service/global-infrastructure/regions
- /aws/service/global-infrastructure/services

Note that these are hardcoded, so they may be out of date for new services/regions.

Integration with SecretsManager is also supported.

Implemented features for this service

- [X] add_tags_to_resource
- [ ] associate_ops_item_related_item

- [ ] cancel_command
- [ ] cancel_maintenance_window_execution
- [ ] create_activation
- [ ] create_association
- [ ] create_association_batch
- [X] create_document
- [X] create_maintenance_window

  Creates a maintenance window. No error handling or input validation has been implemented yet.
- [ ] create_ops_item
- [ ] create_ops_metadata
- [X] create_patch_baseline

  Registers a patch baseline. No error handling or input validation has been implemented yet.
- [ ] create_resource_data_sync
- [ ] delete_activation
- [ ] delete_association
- [X] delete_document
- [ ] delete_inventory
- [X] delete_maintenance_window

  Assumes the provided WindowId exists. No error handling has been implemented yet.
- [ ] delete_ops_item
- [ ] delete_ops_metadata
- [X] delete_parameter
- [X] delete_parameters
- [X] delete_patch_baseline

  Assumes the provided BaselineId exists. No error handling has been implemented yet.
- [ ] delete_resource_data_sync
- [ ] delete_resource_policy
- [ ] deregister_managed_instance
- [ ] deregister_patch_baseline_for_patch_group
- [X] deregister_target_from_maintenance_window

  Deregisters a target from a maintenance window. No error handling has been implemented yet.
- [X] deregister_task_from_maintenance_window
- [ ] describe_activations
- [ ] describe_association
- [ ] describe_association_execution_targets
- [ ] describe_association_executions

- [ ] describe_automation_executions
- [ ] describe_automation_step_executions
- [ ] describe_available_patches
- [X] describe_document
- [X] describe_document_permission

  Parameters max_results, permission_type, and next_token not yet implemented
- [ ] describe_effective_instance_associations
- [ ] describe_effective_patches_for_patch_baseline
- [ ] describe_instance_associations_status
- [ ] describe_instance_information
- [ ] describe_instance_patch_states
- [ ] describe_instance_patch_states_for_patch_group
- [ ] describe_instance_patches
- [ ] describe_inventory_deletions
- [ ] describe_maintenance_window_execution_task_invocations
- [ ] describe_maintenance_window_execution_tasks
- [ ] describe_maintenance_window_executions
- [ ] describe_maintenance_window_schedule
- [X] describe_maintenance_window_targets

  Describes all targets for a maintenance window. No error handling has been implemented yet.
- [X] describe_maintenance_window_tasks
- [X] describe_maintenance_windows

  Returns all windows. No pagination has been implemented yet. Only filtering for Name is supported. The NextExecutionTime-field is not returned.
- [ ] describe_maintenance_windows_for_target
- [ ] describe_ops_items
- [X] describe_parameters
- [X] describe_patch_baselines

  Returns all baselines. No pagination has been implemented yet.
- [ ] describe_patch_group_state
- [ ] describe_patch_groups
- [ ] describe_patch_properties
- [ ] describe_sessions
- [ ] disassociate_ops_item_related_item
- [ ] get_automation_execution
- [ ] get_calendar_state

- [X] get_command_invocation
- [ ] get_connection_status
- [ ] get_default_patch_baseline
- [ ] get_deployable_patch_snapshot_for_instance
- [X] get_document
- [ ] get_inventory
- [ ] get_inventory_schema
- [X] get_maintenance_window

  The window is assumed to exist - no error handling has been implemented yet. The NextExecutionTime-field is not returned.
- [ ] get_maintenance_window_execution
- [ ] get_maintenance_window_execution_task
- [ ] get_maintenance_window_execution_task_invocation
- [ ] get_maintenance_window_task
- [ ] get_ops_item
- [ ] get_ops_metadata
- [ ] get_ops_summary
- [X] get_parameter
- [X] get_parameter_history
- [X] get_parameters
- [X] get_parameters_by_path Implement the get-parameters-by-path-API in the backend.
- [ ] get_patch_baseline
- [ ] get_patch_baseline_for_patch_group
- [ ] get_resource_policies
- [ ] get_service_setting
- [X] label_parameter_version
- [ ] list_association_versions
- [ ] list_associations
- [ ] list_command_invocations
- [X] list_commands

  Pagination and the Filters-parameter is not yet implemented
- [ ] list_compliance_items
- [ ] list_compliance_summaries
- [ ] list_document_metadata_history
- [ ] list_document_versions
- [X] list_documents

- [ ] list_inventory_entries
- [ ] list_ops_item_events
- [ ] list_ops_item_related_items
- [ ] list_ops_metadata
- [ ] list_resource_compliance_summaries
- [ ] list_resource_data_sync
- [X] list_tags_for_resource
- [X] modify_document_permission
- [ ] put_compliance_items
- [ ] put_inventory
- [X] put_parameter
- [ ] put_resource_policy
- [ ] register_default_patch_baseline
- [ ] register_patch_baseline_for_patch_group
- [X] register_target_with_maintenance_window

  Registers a target with a maintenance window. No error handling has been implemented yet.
- [X] register_task_with_maintenance_window
- [X] remove_tags_from_resource
- [ ] reset_service_setting
- [ ] resume_session
- [ ] send_automation_signal
- [X] send_command
- [ ] start_associations_once
- [ ] start_automation_execution
- [ ] start_change_request_execution
- [ ] start_session
- [ ] stop_automation_execution
- [ ] terminate_session
- [ ] unlabel_parameter_version
- [ ] update_association
- [ ] update_association_status
- [X] update_document
- [X] update_document_default_version
- [ ] update_document_metadata
- [ ] update_maintenance_window
- [ ] update_maintenance_window_target

- [ ] update_maintenance_window_task
- [ ] update_managed_instance_role
- [ ] update_ops_item
- [ ] update_ops_metadata
- [ ] update_patch_baseline
- [ ] update_resource_data_sync
- [ ] update_service_setting

### 2.10.118 sso-admin

**class** moto.ssoadmin.models.**SSOAdminBackend**(*region_name: str*, *account_id: str*)

Implementation of SSOAdmin APIs.

Implemented features for this service

- [X] attach_customer_managed_policy_reference_to_permission_set
- [X] attach_managed_policy_to_permission_set
- [X] create_account_assignment
- [ ] create_application
- [ ] create_application_assignment
- [ ] create_instance
- [ ] create_instance_access_control_attribute_configuration
- [X] create_permission_set
- [ ] create_trusted_token_issuer
- [X] delete_account_assignment
- [ ] delete_application
- [ ] delete_application_access_scope
- [ ] delete_application_assignment
- [ ] delete_application_authentication_method
- [ ] delete_application_grant
- [X] delete_inline_policy_from_permission_set
- [ ] delete_instance
- [ ] delete_instance_access_control_attribute_configuration
- [X] delete_permission_set
- [ ] delete_permissions_boundary_from_permission_set
- [ ] delete_trusted_token_issuer
- [ ] describe_account_assignment_creation_status
- [ ] describe_account_assignment_deletion_status
- [ ] describe_application

- [ ] describe_application_assignment
- [ ] describe_application_provider
- [ ] describe_instance
- [ ] describe_instance_access_control_attribute_configuration
- [X] describe_permission_set
- [ ] describe_permission_set_provisioning_status
- [ ] describe_trusted_token_issuer
- [X] detach_customer_managed_policy_reference_from_permission_set
- [X] detach_managed_policy_from_permission_set
- [ ] get_application_access_scope
- [ ] get_application_assignment_configuration
- [ ] get_application_authentication_method
- [ ] get_application_grant
- [X] get_inline_policy_for_permission_set
- [ ] get_permissions_boundary_for_permission_set
- [ ] list_account_assignment_creation_status
- [ ] list_account_assignment_deletion_status
- [X] list_account_assignments
- [X] list_account_assignments_for_principal
- [ ] list_accounts_for_provisioned_permission_set
- [ ] list_application_access_scopes
- [ ] list_application_assignments
- [ ] list_application_assignments_for_principal
- [ ] list_application_authentication_methods
- [ ] list_application_grants
- [ ] list_application_providers
- [ ] list_applications
- [X] list_customer_managed_policy_references_in_permission_set
- [ ] list_instances
- [X] list_managed_policies_in_permission_set
- [ ] list_permission_set_provisioning_status
- [X] list_permission_sets
- [ ] list_permission_sets_provisioned_to_account
- [ ] list_tags_for_resource
- [ ] list_trusted_token_issuers
- [ ] provision_permission_set

- [ ] put_application_access_scope
- [ ] put_application_assignment_configuration
- [ ] put_application_authentication_method
- [ ] put_application_grant
- [X] put_inline_policy_to_permission_set
- [ ] put_permissions_boundary_to_permission_set
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_application
- [ ] update_instance
- [ ] update_instance_access_control_attribute_configuration
- [X] update_permission_set
- [ ] update_trusted_token_issuer

### 2.10.119 stepfunctions

**class** moto.stepfunctions.models.**StepFunctionBackend**(*region_name: str*, *account_id: str*)

Configure Moto to explicitly parse and execute the StateMachine:

```
@mock_aws(config={"stepfunctions": {"execute_state_machine": True}})
```

By default, executing a StateMachine does nothing, and calling *describe_state_machine* will return static data.

Set the following environment variable if you want to get the static data to have a FAILED status:

```
SF_EXECUTION_HISTORY_TYPE=FAILURE
```

Implemented features for this service

- [ ] create_activity
- [X] create_state_machine
- [ ] create_state_machine_alias
- [ ] delete_activity
- [X] delete_state_machine
- [ ] delete_state_machine_alias
- [ ] delete_state_machine_version
- [ ] describe_activity
- [X] describe_execution
- [X] describe_map_run
- [X] describe_state_machine
- [ ] describe_state_machine_alias
- [X] describe_state_machine_for_execution

- [ ] get_activity_task
- [X] get_execution_history
- [ ] list_activities
- [X] list_executions
- [X] list_map_runs
- [ ] list_state_machine_aliases
- [ ] list_state_machine_versions
- [X] list_state_machines
- [X] list_tags_for_resource
- [ ] publish_state_machine_version
- [ ] redrive_execution
- [X] send_task_failure
- [X] send_task_heartbeat
- [X] send_task_success
- [X] start_execution
- [ ] start_sync_execution
- [X] stop_execution
- [X] tag_resource
- [ ] test_state
- [X] untag_resource
- [X] update_map_run
- [X] update_state_machine
- [ ] update_state_machine_alias

### 2.10.120 sts

Implemented features for this service

- [X] assume_role

  Assume an IAM Role. Note that the role does not need to exist. The ARN can point to another account, providing an opportunity to switch accounts.

- [X] assume_role_with_saml
- [X] assume_role_with_web_identity
- [ ] decode_authorization_message
- [ ] get_access_key_info
- [X] get_caller_identity
- [X] get_federation_token
- [X] get_session_token

### 2.10.121 support

Implemented features for this service

- [ ] add_attachments_to_set
- [ ] add_communication_to_case
- [X] create_case

  The IssueType-parameter is not yet implemented
- [ ] describe_attachment
- [X] describe_cases

  The following parameters have not yet been implemented: DisplayID, AfterTime, BeforeTime, MaxResults, Language
- [ ] describe_communications
- [ ] describe_create_case_options
- [ ] describe_services
- [ ] describe_severity_levels
- [ ] describe_supported_languages
- [ ] describe_trusted_advisor_check_refresh_statuses
- [ ] describe_trusted_advisor_check_result
- [ ] describe_trusted_advisor_check_summaries
- [X] describe_trusted_advisor_checks

  The Language-parameter is not yet implemented
- [X] refresh_trusted_advisor_check
- [X] resolve_case

### 2.10.122 swf

Implemented features for this service

- [ ] count_closed_workflow_executions
- [ ] count_open_workflow_executions
- [X] count_pending_activity_tasks
- [X] count_pending_decision_tasks
- [ ] deprecate_activity_type
- [X] deprecate_domain
- [ ] deprecate_workflow_type
- [ ] describe_activity_type
- [X] describe_domain
- [X] describe_workflow_execution
- [ ] describe_workflow_type

- [ ] get_workflow_execution_history
- [ ] list_activity_types
- [X] list_closed_workflow_executions
- [X] list_domains
- [X] list_open_workflow_executions
- [ ] list_tags_for_resource
- [ ] list_workflow_types
- [X] poll_for_activity_task
- [X] poll_for_decision_task
- [X] record_activity_task_heartbeat
- [ ] register_activity_type
- [X] register_domain
- [ ] register_workflow_type
- [ ] request_cancel_workflow_execution
- [ ] respond_activity_task_canceled
- [X] respond_activity_task_completed
- [X] respond_activity_task_failed
- [X] respond_decision_task_completed
- [X] signal_workflow_execution
- [X] start_workflow_execution
- [ ] tag_resource
- [X] terminate_workflow_execution
- [ ] undeprecate_activity_type
- [X] undeprecate_domain
- [ ] undeprecate_workflow_type
- [ ] untag_resource

### 2.10.123 textract

**class** moto.textract.models.**TextractBackend**(*region_name: str*, *account_id: str*)
Implementation of Textract APIs.

Implemented features for this service

- [ ] analyze_document
- [ ] analyze_expense
- [ ] analyze_id
- [ ] create_adapter
- [ ] create_adapter_version

- [ ] delete_adapter
- [ ] delete_adapter_version
- [X] detect_document_text
- [ ] get_adapter
- [ ] get_adapter_version
- [ ] get_document_analysis
- [X] get_document_text_detection

  Pagination has not yet been implemented
- [ ] get_expense_analysis
- [ ] get_lending_analysis
- [ ] get_lending_analysis_summary
- [ ] list_adapter_versions
- [ ] list_adapters
- [ ] list_tags_for_resource
- [ ] start_document_analysis
- [X] start_document_text_detection

  The following parameters have not yet been implemented: ClientRequestToken, JobTag, NotificationChannel, OutputConfig, KmsKeyID
- [ ] start_expense_analysis
- [ ] start_lending_analysis
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_adapter

### 2.10.124 timestream-write

**class** moto.timestreamwrite.models.**TimestreamWriteBackend**(*region_name: str*, *account_id: str*)

When using the decorators, you can use the following internal API to verify records have arrived:

```
from moto.core import DEFAULT_ACCOUNT_ID as ACCOUNT_ID
from moto.timestreamwrite.models import timestreamwrite_backends

backend = timestreamwrite_backends[ACCOUNT_ID]["us-east-1"]
records = backend.databases["mydatabase"].tables["mytable"].records
```

Implemented features for this service

- [ ] create_batch_load_task
- [X] create_database
- [X] create_table
- [X] delete_database

- [X] delete_table
- [ ] describe_batch_load_task
- [X] describe_database
- [X] describe_endpoints
- [X] describe_table
- [ ] list_batch_load_tasks
- [X] list_databases
- [X] list_tables
- [X] list_tags_for_resource
- [ ] resume_batch_load_task
- [X] tag_resource
- [X] untag_resource
- [X] update_database
- [X] update_table
- [X] write_records

### 2.10.125 transcribe

Implemented features for this service

- [ ] create_call_analytics_category
- [ ] create_language_model
- [X] create_medical_vocabulary
- [X] create_vocabulary
- [ ] create_vocabulary_filter
- [ ] delete_call_analytics_category
- [ ] delete_call_analytics_job
- [ ] delete_language_model
- [ ] delete_medical_scribe_job
- [X] delete_medical_transcription_job
- [X] delete_medical_vocabulary
- [X] delete_transcription_job
- [X] delete_vocabulary
- [ ] delete_vocabulary_filter
- [ ] describe_language_model
- [ ] get_call_analytics_category
- [ ] get_call_analytics_job
- [ ] get_medical_scribe_job

- [X] get_medical_transcription_job
- [X] get_medical_vocabulary
- [X] get_transcription_job
- [X] get_vocabulary
- [ ] get_vocabulary_filter
- [ ] list_call_analytics_categories
- [ ] list_call_analytics_jobs
- [ ] list_language_models
- [ ] list_medical_scribe_jobs
- [X] list_medical_transcription_jobs
- [X] list_medical_vocabularies
- [ ] list_tags_for_resource
- [X] list_transcription_jobs
- [X] list_vocabularies
- [ ] list_vocabulary_filters
- [ ] start_call_analytics_job
- [ ] start_medical_scribe_job
- [X] start_medical_transcription_job
- [X] start_transcription_job
- [ ] tag_resource
- [ ] untag_resource
- [ ] update_call_analytics_category
- [ ] update_medical_vocabulary
- [ ] update_vocabulary
- [ ] update_vocabulary_filter

### 2.10.126 wafv2

**class** moto.wafv2.models.**WAFV2Backend**(*region_name: str*, *account_id: str*)

https://docs.aws.amazon.com/waf/latest/APIReference/API_Operations_AWS_WAFV2.html

Implemented features for this service

- [X] associate_web_acl

  Only APIGateway Stages can be associated at the moment.

- [ ] check_capacity
- [ ] create_api_key
- [ ] create_ip_set
- [ ] create_regex_pattern_set

- [ ] create_rule_group
- [X] create_web_acl

  The following parameters are not yet implemented: CustomResponseBodies, CaptchaConfig
- [ ] delete_api_key
- [ ] delete_firewall_manager_rule_groups
- [ ] delete_ip_set
- [ ] delete_logging_configuration
- [ ] delete_permission_policy
- [ ] delete_regex_pattern_set
- [ ] delete_rule_group
- [X] delete_web_acl

  The LockToken-parameter is not yet implemented
- [ ] describe_all_managed_products
- [ ] describe_managed_products_by_vendor
- [ ] describe_managed_rule_group
- [X] disassociate_web_acl
- [ ] generate_mobile_sdk_release_url
- [ ] get_decrypted_api_key
- [ ] get_ip_set
- [ ] get_logging_configuration
- [ ] get_managed_rule_set
- [ ] get_mobile_sdk_release
- [ ] get_permission_policy
- [ ] get_rate_based_statement_managed_keys
- [ ] get_regex_pattern_set
- [ ] get_rule_group
- [ ] get_sampled_requests
- [X] get_web_acl
- [X] get_web_acl_for_resource
- [ ] list_api_keys
- [ ] list_available_managed_rule_group_versions
- [ ] list_available_managed_rule_groups
- [ ] list_ip_sets
- [ ] list_logging_configurations
- [ ] list_managed_rule_sets
- [ ] list_mobile_sdk_releases

- [ ] list_regex_pattern_sets
- [ ] list_resources_for_web_acl
- [X] list_rule_groups
- [X] list_tags_for_resource

  Pagination is not yet implemented
- [X] list_web_acls
- [ ] put_logging_configuration
- [ ] put_managed_rule_set_versions
- [ ] put_permission_policy
- [X] tag_resource
- [X] untag_resource
- [ ] update_ip_set
- [ ] update_managed_rule_set_version_expiry_date
- [ ] update_regex_pattern_set
- [ ] update_rule_group
- [X] update_web_acl

  The following parameters are not yet implemented: LockToken, CustomResponseBodies, CaptchaConfig

### 2.10.127 workspaces

**class** moto.workspaces.models.**WorkSpacesBackend**(*region_name: str*, *account_id: str*)

Implementation of WorkSpaces APIs.

Implemented features for this service

- [ ] associate_connection_alias
- [ ] associate_ip_groups
- [ ] associate_workspace_application
- [ ] authorize_ip_rules
- [ ] copy_workspace_image
- [ ] create_connect_client_add_in
- [ ] create_connection_alias
- [ ] create_ip_group
- [ ] create_standby_workspaces
- [X] create_tags
- [ ] create_updated_workspace_image
- [ ] create_workspace_bundle
- [X] create_workspace_image

- [X] create_workspaces
- [ ] delete_client_branding
- [ ] delete_connect_client_add_in
- [ ] delete_connection_alias
- [ ] delete_ip_group
- [ ] delete_tags
- [ ] delete_workspace_bundle
- [ ] delete_workspace_image
- [ ] deploy_workspace_applications
- [X] deregister_workspace_directory Deregister Workspace Directory with the matching ID.
- [ ] describe_account
- [ ] describe_account_modifications
- [ ] describe_application_associations
- [ ] describe_applications
- [ ] describe_bundle_associations
- [ ] describe_client_branding
- [X] describe_client_properties
- [ ] describe_connect_client_add_ins
- [ ] describe_connection_alias_permissions
- [ ] describe_connection_aliases
- [ ] describe_image_associations
- [ ] describe_ip_groups
- [X] describe_tags
- [ ] describe_workspace_associations
- [ ] describe_workspace_bundles
- [X] describe_workspace_directories Return info on all directories or directories with matching IDs.
- [X] describe_workspace_image_permissions
- [X] describe_workspace_images
- [ ] describe_workspace_snapshots
- [X] describe_workspaces
- [ ] describe_workspaces_connection_status
- [ ] disassociate_connection_alias
- [ ] disassociate_ip_groups
- [ ] disassociate_workspace_application
- [ ] import_client_branding
- [ ] import_workspace_image

- [ ] list_available_management_cidr_ranges
- [ ] migrate_workspace
- [ ] modify_account
- [ ] modify_certificate_based_auth_properties
- [X] modify_client_properties
- [ ] modify_saml_properties
- [X] modify_selfservice_permissions
- [ ] modify_workspace_access_properties
- [X] modify_workspace_creation_properties
- [ ] modify_workspace_properties
- [ ] modify_workspace_state
- [ ] reboot_workspaces
- [ ] rebuild_workspaces
- [X] register_workspace_directory
- [ ] restore_workspace
- [ ] revoke_ip_rules
- [ ] start_workspaces
- [ ] stop_workspaces
- [ ] terminate_workspaces
- [ ] update_connect_client_add_in
- [ ] update_connection_alias_permission
- [ ] update_rules_of_ip_group
- [ ] update_workspace_bundle
- [X] update_workspace_image_permission

## 2.11 Contributing

Want to contribute to Moto? Yes please! The aim is to mock as many services and features as possible. With AWS releasing new services almost daily, that is for sure a moving target! So any help is welcome.

Check our *Development Installation* guide on how to install Moto locally. The *Architecture* page can be useful or interesting if you want to dive deeper in Moto's guts, but feel free to skip this page if you're not interested.

Want to add some new features, or improving the behaviour of existing ones? *New Features* is for you.

We also have a collection of *Development Tips* to give some guidance.

Finally, the *FAQ* page may have some questions to your burning answers that popped up while reading this saga.

## 2.12 Development Installation

This is a guide how to install Moto for contributors.

The following software is assumed to be present:

- Python 3.x
- Docker
- Git

### 2.12.1 Checking out the code

Contributing to Moto involves forking the project. GitHub has a handy guide explaining how to do this: https://docs.github.com/en/get-started/quickstart/contributing-to-projects

### 2.12.2 Installing Moto locally

It is recommended to work from some kind of virtual environment, i.e. *virtualenv*, to prevent cross-contamination with other projects. From within such a virtualenv, run the following command to install all required dependencies:

```
make init
```

With all dependencies installed, run the following command to run all the tests and verify your environment is ready:

```
make test
```

Note that this may take awhile - there are many services, and each service will have a boatload of tests.

You can also run the linting checks separately:

```
make lint
```

To verify all tests pass for a specific service, for example for *s3*, run these commands manually:

```
ruff check moto/s3 tests/test_s3
ruff format --check moto/s3 tests/test_s3
pylint moto/s3 tests/test_s3
mypy
pytest -sv tests/test_s3
```

If ruff fails, you can run the following command to automatically format the offending files:

```
make format
```

If any of these steps fail, please see our *FAQ* or open an issue on Github.

### 2.12.3 Development within a Devcontainer

Moto is equipped with a *devcontainer.json* for use in VSCode Devcontainers and/or GitHub Codespaces.

Launching the Devcontainer or Codespace:

- Configures Docker-in-Docker.
- Sets up a Virtual Environment in *${workspaceFolder}/.venv*.
- Runs *make init*.

Be patient while the Devcontainer or Codespace launches as dependencies automatically installed.

Once both *postCreateCommand* and *postStartCommand* have run, open a Terminal session in VSCode and run:

```
source .venv/bin/activate
```

Then standard development on Moto can proceed, for example:

```
ruff check moto/s3 tests/test_s3
ruff format --check moto/s3 tests/test_s3
pylint moto/s3 tests/test_s3
mypy
pytest -sv tests/test_s3
```

## 2.13 Architecture

If you're interested in the inner workings of Moto, or are trying to hunt down some tricky bug, the below sections will help you learn more about how Moto works.

### 2.13.1 Decorator Architecture

When using decorators, Moto works by intercepting the HTTP request that is send out by boto3. This has multiple benefits:

- boto3 keeps the responsibility of any initial parameter validation
- boto3 keeps the responsibility of any post-processing of the response
- Other SDK's can also be used against Moto, as all SDK's use the HTTP API to talk to AWS in the end.

Botocore utilizes an event-based architecture. Events such as *creating-client-class* and *before-send* are emitted for all boto3-requests.

When the decorator starts, Moto registers a hook into the *before-send*-event that allows us to intercept the HTTP-request that was about to be sent. For every intercepted request, Moto figures out which service/feature is called based on the HTTP request prepared by *boto3*, and calls our own stub instead.

### 2.13.2 Determining which service/feature is called

There are multiple ways for Moto to determine which request was called. For each request we need to know two things:

1. Which service is this request for?
2. Which feature is called?

When using one or more decorators, Moto will load all urls from *{service}/urls.py::url_bases*. Incoming requests are matched against those to figure out which service the request has to go to. After that, we try to find right feature by looking at:

1. The *Action*-parameter in the querystring or body, or
2. The *x-amz-target*-header, or
3. The full URI. Boto3 has a model for each service that maps the HTTP method and URI to a feature. Note that this only works if the *Responses*-class has an attribute *SERVICE_NAME*, as Moto needs to know which boto3-client has this model.

When using Moto in ServerMode, all incoming requests will be made to *http://localhost*, or wherever the MotoServer is hosted, so we can no longer use the request URI to figure out which service to talk to. In order to still know which service the request was intended for, Moto will check:

1. The authorization header first (*HTTP_AUTHORIZATION*)
2. The target header next (*HTTP_X_AMZ_TARGET*)
3. Or the path header (*PATH_INFO*)
4. If all else fails, we assume S3 as the default

Now that we have determined the service, we can rebuild the original host this request was send to. With the combination of the restored host and path we can match against the *url_bases* and *url_paths* in *{service}/urls.py* to determine which Moto-method is responsible for handling the incoming request.

### 2.13.3 File Architecture

To keep a logical separation between services, each one is located into a separate folder. Each service follows the same file structure.

The below table explains the purpose of each file:

| File | Responsibility |
|---|---|
| __init__.py | Initializes the decorator to be used by developers |
| urls.py | List of the URL's that should be intercepted |
| responses.py | Requests are redirected here first. Responsible for extracting parameters and determining the response format |
| models.py | Responsible for the data storage and logic required. |
| exceptions.py | Not required - this would contain any custom exceptions, if your code throws any |

## 2.14 New Features

Moto has a script that can automatically provide the scaffolding for a new service, and for adding new features to an existing service. This script does all the heavy lifting of generating template code, by looking up the API specification of a given *boto3* method and adding the necessary code to mock it.

Please try it out by running:

```
export AWS_DEFAULT_REGION="us-east-2"
python scripts/scaffold.py
```

The script uses the *click*-module to assists with autocompletion.

- Use Tab to auto-complete the first suggest service, or
- Use the up and down-arrows on the keyboard to select something from the dropdown
- Press enter to continue

An example interaction:

```
$ python scripts/scaffold.py
Select service: codedeploy

==Current Implementation Status==
[ ] add_tags_to_on_premises_instances
...
[ ] create_deployment
...
[ ] update_deployment_group
================================
Select Operation: create_deployment


    Initializing service    codedeploy
    creating        moto/codedeploy
    creating        moto/codedeploy/models.py
    creating        moto/codedeploy/exceptions.py
    creating        moto/codedeploy/__init__.py
    creating        moto/codedeploy/responses.py
    creating        moto/codedeploy/urls.py
    creating        tests/test_codedeploy
    creating        tests/test_codedeploy/test_server.py
    creating        tests/test_codedeploy/test_codedeploy.py
    inserting code  moto/codedeploy/responses.py
    inserting code  moto/codedeploy/models.py

Remaining steps after development is complete:
- Run scripts/implementation_coverage.py,
- Run scripts/update_backend_index.py.
```

**Note:** The implementation coverage script is used to automatically update the full list of supported services.

**Warning:** In order to speed up the performance of MotoServer, all AWS URL's that need intercepting are indexed. When adding/replacing any URLs in *{service}/urls.py*, please run *python scripts/update_backend_index.py* to update this index.

## 2.15 PR Checklist

Ready to open a new PR? Great. Please have a quick look at this checklist to make sure that you're ready:

- [ ] Feature is added
- [ ] The linter is happy
- [ ] Tests are added
- [ ] All tests pass, existing and new

Can't quite get it working? Create the PR anyway! Seeing the code can help others figure out what's wrong.

Halfway through and too busy to finish? Create the PR anyway! Others can use your work and build on it to finish the feature.

**Note:** You can indicate a PR that's not quite ready with the *needs-help*-label.

Are you not sure on what you want to implement, or want some advice on how to approach things? Feel free to open a new issue on Github: https://github.com/getmoto/moto/issues

## 2.16 FAQ for Developers

### 2.16.1 When running the linter...

#### Why does ruff give different results?

Different versions of ruff produce different results. The CI system uses the version set in *requirements-dev.txt*. To ensure that our CI passes, please format the code using the same version.

### 2.16.2 When running a test...

#### Why does it take ages to run a single test?

There are a few reasons why this could happen. If the test uses Docker, it could take a while to:

- Download the appropriate Docker image
- Run the image
- Wait for the logs to appear

#### Why are my tests failing in ServerMode?

- Make sure that the correct url paths are present in *urls.py*
- Make sure that you've run `scripts/update_backend_index.py` afterwards, to let MotoServer know the urls have changed.

### 2.16.3 What ...

#### Does ServerMode refer to?

**ServerMode refers to Moto running as a stand-alone server. This can be useful to:**

- Test non-Python SDK's
- Have a semi-permanent, local AWS-like server running that multiple applications can talk to

#### Types of tests are there?

There are three types of tests:

1. decorator tests
2. ServerMode tests
3. server tests (located in test_server.py)

The decorator tests refer to the normal unit tests that are run against an in-memory Moto instance.

The ServerMode tests refer to the same set of tests - but run against an external MotoServer instance. When running tests in ServerMode, each boto3-client and boto3-resource are intercepted, and enriched with the `endpoint_url="http://localhost:5000"` argument. This allows us to run the same test twice, and verify that Moto behaves the same when using decorators, and in ServerMode.

The last 'server' tests are low-level tests that can be used to verify that Moto behaves exactly like the AWS HTTP API. Each test will spin up the MotoServer in memory, and run HTTP requests directly against that server. This allows the developer to test things like HTTP headers, the exact response/request format, etc.

#### Alternatives are there?

The best alternative would be LocalStack.

LocalStack is Moto's bigger brother with more advanced features, such as EC2 VM's that you can SSH into and Dockerized RDS-installations that you can connect to.

### 2.16.4 Why am I getting errors...

#### That my new module could not be found when using the scaffold-script?

```
File "scripts/scaffold.py", line 499, in insert_codes
  insert_code_to_class(responses_path, BaseResponse, func_in_responses)
File "scripts/scaffold.py", line 424, in insert_code_to_class
  mod = importlib.import_module(mod_path)
File "/usr/lib/python3.8/importlib/__init__.py", line 127, in import_module
```

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```
  return _bootstrap._gcd_import(name[level:], package, level)

ModuleNotFoundError: No module named 'moto.kafka'
```

This will happen if you've ran `pip install .` prior to running *scripts/scaffold.py*.

Instead, install Moto as an editable module instead:

```
pip uninstall moto
pip install -e .
```

#### Related to Docker when running tests?

AWSLambda and Batch services use Docker to execute the code provided to the system, which means that Docker needs to be installed on your system in order for these tests to run.

#### Installing Moto using ZSH on MacOS?

When using `pip install` on ZSH, you might see the following: `zsh: no matches found`. This is because ZSH requires the full module to be in quotes.

```
pip install "moto[ssm]"
```

## 2.17 Development Tips

Below you can find some tips that might help during development.

### 2.17.1 Naming Conventions

Let's say you want to implement the *import_certificate* feature for the ACM service.

Implementing the feature itself can be done by creating a method called *import_certificate* in *moto/acm/responses.py*. It's considered good practice to deal with input/output formatting and validation in *responses.py*, and create a method *import_certificate* in *moto/acm/models.py* that handles the actual import logic.

When writing tests, you'll want to add a new method called *def test_import_certificate* to *tests/test_acm/test_acm.py*. Additional tests should also have names indicate of what's happening, i.e. *def test_import_certificate_fails_without_name*, *def test_import_existing_certificate*, etc.

#### Partial Implementations

If a service is only partially implemented, a warning can be used to inform the user:

```
import warnings
warnings.warn("The Filters-parameter is not yet implemented for client.method()")
```

## 2.18 Intercepting URLs

### 2.18.1 Determining which URLs to intercept

In order for Moto to know which requests to intercept, Moto needs to know which URLs to intercept. But how do we know which URL's should be intercepted? There are a few ways of doing it:

- For an existing service, copy/paste the url-path for an existing feature and cross your fingers and toes
- Use the service model that is used by botocore: https://github.com/boto/botocore/tree/develop/botocore/data Look for the *requestUri*-field in the *services.json* file.
- Make a call to AWS itself, and intercept the request using a proxy. This gives you all information you could need, including the URL, parameters, request and response format.

#### Intercepting AWS requests

Download and install a proxy such MITMProxy.

With the proxy running, the easiest way of proxying requests to AWS is probably via the CLI.

```
export HTTP_PROXY=http://localhost:8080
export HTTPS_PROXY=http://localhost:8080
aws ses describe-rule-set --no-verify-ssl
```

```
from botocore.config import Config
proxy_config = Config(proxies={'http': 'localhost:8080', 'https': 'localhost:8080'})
boto3.client("ses", config=proxy_config, use_ssl=False, verify=False)
```

## 2.19 Writing tests

One test should only verify a single feature/method. I.e., one test for *create_resource()*, another for *update_resource()*, etc.

### 2.19.1 Negative tests

When writing negative tests, try to use the following format:

```
with pytest.raises(botocore.exceptions.ClientError) as exc:
    client.failing_call(..)
err = exc.value.response["Error"]
# Use the pytest assert method, see https://docs.pytest.org/en/stable/how-to/assert.html#
assert err["Code"] == ..
assert err["Message"] == ..
```

This is the best way to ensure that exceptions are dealt with correctly by Moto.

### 2.19.2 ServerMode tests

Our CI runs all tests twice - one normal run, and one run in ServerMode. In ServerMode, Moto is started as a standalone Flask server, and all tests are run against this Flask-instance.

To verify whether your tests pass in ServerMode, you can run the following commands:

```
python moto/server.py
TEST_SERVER_MODE=true pytest -sv tests/test_service/..
```

### 2.19.3 Parallel tests

To speed up our CI, the tests for the *awslambda*, *batch*, *ec2* and *sqs* services will run in parallel. This means the following:

- Make sure you use unique names for functions/queues/etc
- Calls to *describe_reservations()*/*list_queues()*/etc might return resources from other tests

## 2.20 Utilities

### 2.20.1 Tagging Service

A dedicated TaggingService exists in *moto.utilities*, to help with storing/retrieving tags for resources.

Not all services use it yet, but contributors are encouraged to use the TaggingService for all new features.

### 2.20.2 Paginator

When requesting a list of resources, almost all AWS services use pagination to stagger the response. Moto provides a utility class to automatically paginate a response, without having to manually write the logic.

There are three components that make this work:

1. The Responses-method will call the backend with a max_result/next_token parameter
2. The backend-method has a plain method that's decorated with *@paginate*
3. A configuration model is supplied to the decorator that contains all the details.

See the below example how it works in practice:

```
class MyResponse(BaseResponse):

    # The Response-class looks like any other - read the input parameters, and call the␣
↪backend to retrieve the resources
    def list_resources():
        max_results = 100
        next_token = self._get_param("NextToken")
        # Note that we're getting both the results and the next_token
        # The decorator in the backend returns this tuple
        paged_results, next_token = self.backend.list_resources(
            max_results=max_results, next_token=next_token
        )
```

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```
        ...

from moto.utilities.paginator import paginate
class MyBackend(BaseBackend):

    # The model that contains the configuration required for the paginator
    PAGINATION_MODEL = {
        # key = name of the method in the backend
        "list_resources": {
            #
            # name of the kwarg that contains the next token, which should be passed to␣
↪the backend
            # backend.list_resources(next_token=..)
            "input_token": "next_token",
            #
            # name of the kwarg that contains the max number of results, which should be␣
↪passed to the backend
            "limit_key": "max_results",
            #
            # The default limit of the above parameter is not provided
            "limit_default": 100,
            #
            # One or more attributes  that guarantee uniqueness for a given resource.
            # For most resources it will just be an ID, or ARN, which is always unique.
            # An encoded version of these attributes is used as the NextToken.
            "unique_attribute": "arn",
            # Provide a list if only a combination of attributes is guaranteed to be␣
↪unique
            "unique_attribute": ["start_date", "execution_arn"],
            #
            # By default, an exception will be thrown if the user-provided next_token is␣
↪invalid
            "fail_on_invalid_token": True  # Default value - no need to specify this
            # This can be customized to:
            #   - silently fail, and just return an empty list
            "fail_on_invalid_token": False,
            #   - throw a custom exception, by providing an exception class
            #     The paginator will `raise CustomException()` or `raise␣
↪CustomException(invalid_token)`
            "fail_on_invalid_token": CustomException
        },
        # another method that will use different configuration options
        "list_other_things": {
            ...
        },
    }

    # The decorator with the pagination logic
    @paginate(pagination_model=PAGINATION_MODEL)
    # Note that this method does not have the 'next_token'/'max_results'-arguments
    def list_resources(self):
        # Note that we simply return all resources - the decorator takes care of all␣
```

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```
↪pagination magic
        return self.full_list_of_resources

    @paginate(pagination_model=PAGINATION_MODEL)
    # If we do need the 'next_token'/'max_results'-arguments, just add them to the function
    # The decorator will only pass them along if required
    def list_other_things(self, max_results=None):
        if max_results == "42":
            # Custom validation magic
            pass
        return self.full_list_of_resources
```

## 2.21 State Transition Management

When developing a model where the resource is not available immediately, such as EC2 instances, a configuration option is available to specify whether you want mocked resources to be available immediately (to speed up unit testing), or whether you want an artificial delay to more closely mimick AWS' behaviour where resources are only available/ready after some time.

See the user-documentation here: *State Transitions*

In order for a new model to support this behaviour out of the box, it needs to be configured and registered with the State Manager. The following steps need to be taken for this to be effective:

- Extend the new model with the ManagedState-class
- Call the ManagedState-constructor with information on which state transitions are supported
- Decide when to advance the status
- Register the model with the StateManager

An example model could look like this:

```
from moto.moto_api._internal.managed_state_model import ManagedState

class NewModel(ManagedState):
    def __init__(self):
        ManagedState.__init__(self,
                              # A unique name should be chosen to uniquely identify this␣
↪model
                              # Any name is acceptable - a typical format would be
↪'API:type'
                              # Examples: 'S3::bucket', 'APIGateway::Method',
↪'DynamoDB::Table'
                              model_name="new::model",
                              # List all the possible status-transitions here
                              transitions=[("initializing", "starting"),
                                           ("starting", "ready")])

    def to_json(self):
        # ManagedState gives us a 'status'-attribute out of the box
        # On the first iteration, this will be set to the first status of the first␣
```

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```
↪transition
        return {
            "name": ...,
            "status": self.status,
            ...
        }

from moto.moto_api import state_manager

class Backend():

    def list_resources():
        for ec2_instance in all_resources:
            # For users who configured models of this type to transition manually, this␣
↪is where we advance the status
            # Say the transition is registered like so: {"progression": "manual", "times
↪": 3}
            #
            # The user calls 'list_resources' 3 times, the advance-method is called 3␣
↪times, and the state manager advances the state after the 3rd time.
            # This all happens out of the box - just make sure that the `advance()`-
↪method is invoked when appropriate
            #
            # If the transition is set to progress immediately, this method does exactly␣
↪nothing.
            #
            # If the user decides to change the progression to be time-based, where the␣
↪status changed every y seconds, this method does exactly nothing.
            # It will has to be called though, for people who do have the manual␣
↪progression configured
            model.advance()
        return all_models

    def describe_resource():
        resource = ...
        # Depending on the API, there may be different ways for the user to retrieve the␣
↪same information
        # Make sure that each way (describe, list, get_, ) calls the advance()-method,␣
↪and the resource can actually progress to the next state
        resource.advance()
        return resource
```

Make sure that the model is registered with the StateManager. This can be done in *moto/moto_api/__init__.py*:

```
state_manager.register_default_transition(
    # This name should be the same as the name used in NewModel
    model_name="new::model",
    # Any transition-config is possible - this is a good default option though
    transition={"progression": "immediate"},
)
```

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