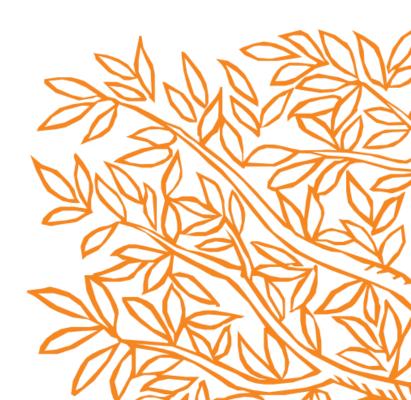


LocalStack

An AWS cloud stack for testing your apps locally

October 2020 Ligia Stan – Recommenders Team



Agenda

- How do we currently test AWS cloud services?
- What is LocalStack?
- What does LocalStack provide ?
- Advantages and disadvantages
- Integrating LocalStack with JUnit
- Demo
- Things to be aware of
- Links



How do we currently test AWS cloud services?

All our existing patterns for testing AWS services have drawbacks

- Mock interactions with the AWS client
 - Problems:
 - Completely fake implementation based on observed behaviour at the time of writing the test
 - Useful only as a regression test



How do we currently test AWS cloud services?

All our existing patterns for testing AWS services have drawbacks

- Running integration tests against a "test area" in a real AWS account
 - Problems:
 - Tests depend on externally provisioned infrastructure
 - Build machine needs access to that account
 - Concurrent tests against the same resource may fail



How do we currently test AWS cloud services?

All our existing patterns for testing AWS services have drawbacks

- Minimize the AWS code behind an interface and only test up to that interface
 - Problems
 - May still be bugs behind that interface
 - Adds needless complexity and abstraction



What is LocalStack?

- Test/mock framework for testing apps that work with AWS Cloud services locally
- Open-source
- Supports a wide variety of AWS Services
- Compatible with
 - AWS CLI tools
 - Java SDK libraries
 - Python Boto libraries



What does LocalStack provide?

- Provides a way to test many of the services used in KD, such as:
 - Lambda
 - **-** S3
 - SNS
 - SQS
 - And many others
- Some of them are less likely to be representative of the real environment, such as:
 - IAM



Advantages and disadvantages

Advantages

- No dependency on cloud
- Simulates AWS service behaviour
- Can simulate errors with AWS services to test error handling
- Works with existing AWS code and tools with very few changes

Disadvantages

- Some services may be less accurate simulations (e.g., IAM)
- Updated regularly, but may lag slightly behind new AWS releases

Integrating LocalStack with JUnit

Making LocalStack services available to JUnit

- Java library that supports JUnit tests
- Use Testcontainers to handle launch and shutdown of services for tests
 - Provides interfaces to launch and shutdown containers per test or for all tests
 - Provides mechanisms to expose ports to the tests
 - Works well with docker-compose for multi-container systems

Demo

https://github.com/LigiaStefanaStan/localstack-tests



Things to be aware of

- LocalStack will create files with the privileges of the Docker process
 - LocalStack can store data outside the container to make it easier to run tests
 - These files will be created by the Docker process, which may be running as root
 - This caused us issues on our build machine
 - Moving the files under /tmp resolved the issue

Links

- Demo
 - https://github.com/LigiaStefanaStan/localstack-tests
- LocalStack:
 - https://github.com/localstack/localstack
 - Python Client : https://github.com/localstack/localstack-python-client



Links

- Testcontainers:
 - Scala: https://github.com/testcontainers/testcontainers-scala
 - Java: https://github.com/testcontainers/testcontainers-java
 - Python: https://github.com/testcontainers/testcontainers-python





Thank you

Any questions?

