The Journey of Testing with Stubs and Proxies in AWS

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Challenges

- Integration tests fail due to unreliable dependency servers
- Hard to test different test data permutations for dependency servers
- Need to do resiliency testing
Our Solution

Wiremock

Overview of Wiremock

Wiremock is a library for stubbing and proxying web services

- Stubbing
- Fault Injection
- Easy Set up
- Easy onboarding
How does Wiremock work?

- Configure the Wiremock server to be man-in-the-middle
- Increased integration test pass rate
- Increased code coverage
- Does not interrupt other team’s calling the SUT

Overview of AWS
Overview of AWS

Amazon Web Services (AWS) is a cloud computing services

- On-demand delivery of IT resources and applications
- Pay-as-you-go pricing

AWS Architecture

[Diagram showing VPC, ELB for SUT, SUT 1, SUT 2, Subnet connections]
Before Wiremock

Wiremock in AWS
We tried this

- Deploy Wiremock on SUT EC2 instance
- No consistent stub response!

Our Solution

- Deploy Wiremock on dedicated EC2 and ELB
- Consistent Stub responses!
If no stubs...

WM will proxy the request to dependency server

Wiremock Code Snipets
Starting Up Wiremock Server

java -jar wiremock-1.53-standalone.jar --verbose --port 8080 --proxy-all=[Dependency Server DNS Name]

Stubbing the response

//This calls Wiremock API to stub the response

stubFor(get(urlEqualTo("/from/where"))
.willReturn(aResponse().withStatus(200)
 .withHeader("Cache-Control", "no-cache")
 .withHeader("Content-Type", "text/plain")
 .withBody("Taiwan")));
Simulating Fault

//This calls Wiremock API for fault injection

stubFor(get(urlEqualTo("/some/thing"))
  .willReturn(aResponse()
  .withFault(Fault.EMPTY_RESPONSE)));

Automate WM Deployment
Automate Wiremock Deployment

Chef is an infrastructure automation code tool we use
• Code how you deploy and manage your infrastructure
• Allows version control
• Code can be reused

Automate Wiremock Deployment

We wrote a Wiremock Recipe
• Download the Wiremock jar
• Start up the Wiremock server
Automate Wiremock Deployment

Berkshelf is a dependency manager for chef
- Get the Java recipe to download Java
- Get the Wiremock recipe to deploy Wiremock server

Chef Snippet

```bash
#This will start the Wiremock server with the parameters passed in

function start { cd "${USER_DIRECTORY}" ;java -jar wiremock-`${WIREMOCK_VERSION}`-standalone.jar --port ${PORT} --proxy-via ${PROXY_VIA} --proxy-all=${PROXY_ALL} --verbose > /var/log/wiremock.log 2>&1 & }
```
Automate Wiremock Stack Creation

Use AWS CloudFormation API
- Provision EC2 instances and ELB
- Create Auto Scaling Group
- Set up other AWS resources

Use WireMock

Call Chef from CloudFormation
How to Call Cookbook From CloudFormation

Write shell scripts in the InstanceLaunchConfig section
1. Download and install chef
2. Run Chef. In this case, we created a Wiremock role to execute the Java and Wiremock cookbooks.

Call Chef from CloudFormation

"5_run_chef": {
   "command": {
      "Fn::Join": [ "", [ "/usr/bin/chef-solo -c /var/chef/config/solo.rb o 'role["", { "Ref": "Role" }, "]' -E ", { "Ref": "Environment" },""] ]
   }
}
Deep Dives

Demo

Test Automation  SUT  Wiremock Server  Yelp
Recap

Solution: Wiremock
- Tests don't fail due to unreliable dependency servers
- Less engineers’ time spent on unnecessary debugging
- Resiliency issues are found before production
- Less production escapes and firefighting
- Happy Engineers
What we learned

What We Learned

• The initial investment is worth it
• Try to be flexible
• Set up DNS
References

- My talk for CI/CD with Mocking and Resiliency Testing in AWS re:invent Conference
- http://wiremock.org/
- https://www.chef.io/

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