

adaptTo()

APACHE SLING & FRIENDS TECH MEETUP
2 - 4 SEPTEMBER 2019

Introducing AEM OpenCloud

Cliffano Subagio, Shine Solutions Australia



About Australia

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About us

- **Shine Solutions**

Adobe Community Solution Partner

AEM infrastructure projects on AWS since 2013

- **Cliffano Subagio**

Senior Consultant at Shine Solutions, Australia

Creator and core contributor of AEM OpenCloud



AEM OpenCloud



A brief timeline

- First AEM infra on AWS project in 2013-2014
- Common patterns identified by third project
- AEM OpenCloud project started in 2016
- As of today, AEM OpenCloud:
 - runs in production at 2 banks and 2 insurance companies
 - is being adopted by a government organisation



The ultimate goal

Fully automated solution
for managing multiple AEM environments
with just clicks of buttons



What is AEM OpenCloud?

- **Open source infrastructure platform**

All code on GitHub with Apache 2 license, no vendor lock-in

All packages published to public registries

- **AWS focused with modular design**

AWS is the first class supported platform

Building blocks for other platforms



What is AEM OpenCloud?

- **Multiple AEM versions support**
AEM 6.2, 6.3, 6.4, 6.5
Flexible migration path
- **Multiple operating systems support**
Amazon Linux 2, RHEL7, experimental CentOS7
RHEL8 support in development



Why use AEM OpenCloud?

- **Massive jump start into the cloud**
Accumulation of ~five years of experience
126,000 LOC, production ready
- **Run AEM infrastructure within your perimeter**
Your standard operating environment
Your policies, your practices, your compliance requirements



Why use AEM OpenCloud?

- **Highly configurable and customisable**

Hundreds of configuration properties with sane defaults

Multiple build and runtime customisation points

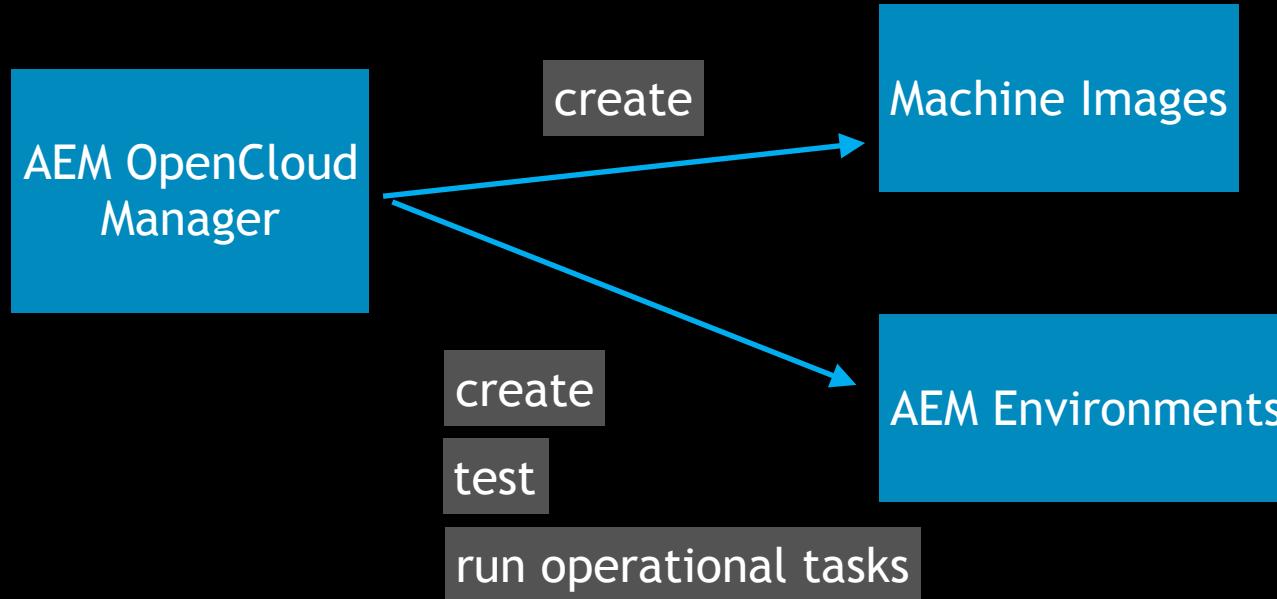
- **Security and testing focus**

Minimal blast radius

Library, infrastructure, environment testing

Regular dependencies vulnerability scanning

How does it work?





AEM OpenCloud Manager



What is AEM OpenCloud Manager?

A set of Jenkins pipelines for
managing AEM OpenCloud ecosystem

Bamboo/GitLab users? Let's chat.



Demo - AEM OpenCloud Manager Screen



aem-opencloud-4.0.0

AEM OpenCloud Jenkins project folder automatically provisioned with AEM OpenCloud Manager.

[add description](#)

S	W	Name ↓	Last Success	Last Failure	Last Duration
		installation	N/A	N/A	N/A
		machine-images	N/A	N/A	N/A
		manage-environments	N/A	N/A	N/A
		migration	N/A	N/A	N/A
		operational-tasks	N/A	N/A	N/A
		testing	N/A	N/A	N/A

Icon: [S](#) [M](#) [L](#)

[Legend](#)

[RSS for all](#)

[RSS for failures](#)

[RSS for just latest builds](#)



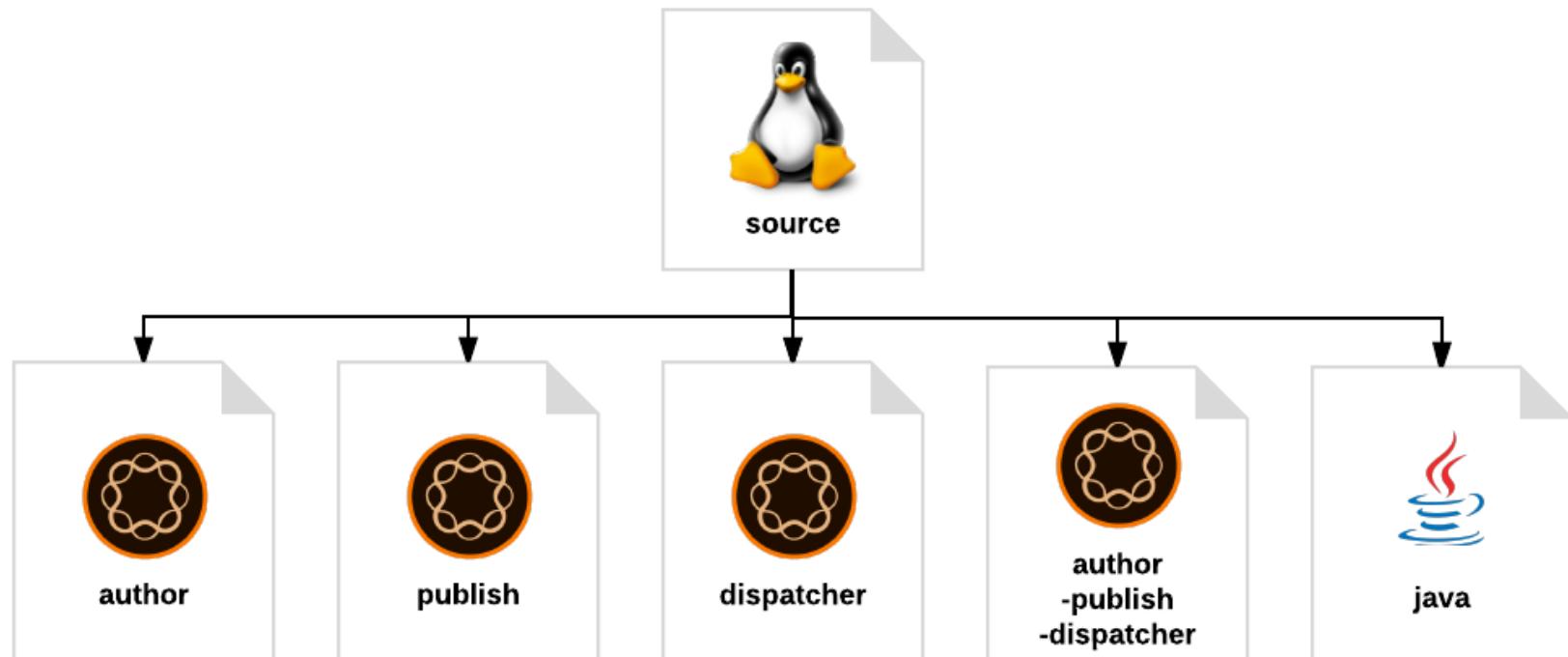
Machine Images



Machine Images

- Built using Packer AEM
- AMI support
with experimental Docker support
- Install AEM once per version
Create environment multiple times

Components





AEM Profile

- **aemXX_spY_cfpZZ**
aem62_sp1_cfp20 installs AEM 6.2 with its SP 1 and CFP 20
aem65_sp1 installs AEM 6.5 with its SP1
- **Correctness**
Package upload, check, install, check, AEM readiness checks
- **AEM installation using bstopp/puppet-aem**



Demo - Example Machine Images Screen

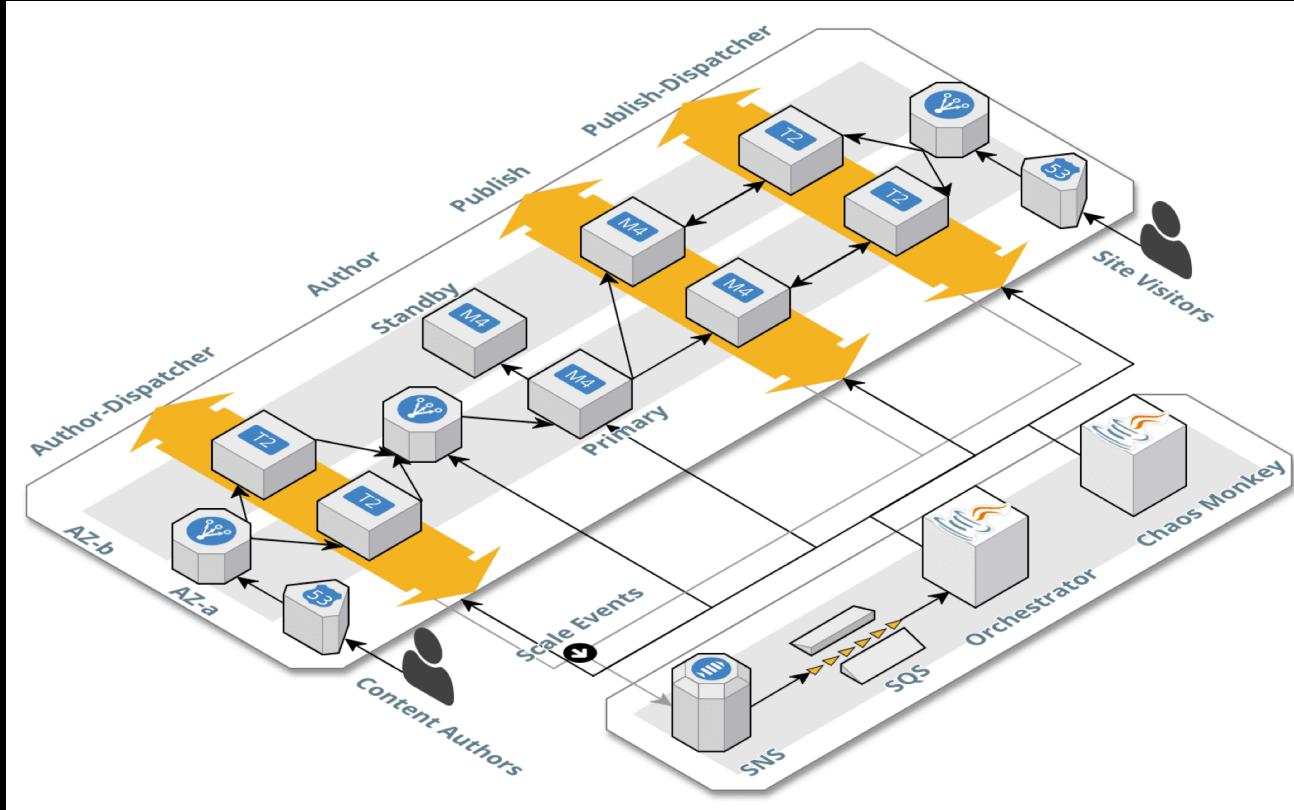
All[+](#)[add description](#)

S	W	Name ↓	Last Success	Last Failure	Last Duration
		aws-amazon-linux2-aem62	N/A	N/A	N/A
		aws-amazon-linux2-aem63	N/A	N/A	N/A
		aws-amazon-linux2-aem64	N/A	N/A	N/A
		aws-amazon-linux2-aem65	N/A	N/A	N/A
		aws-centos7-aem62	N/A	N/A	N/A
		aws-centos7-aem63	N/A	N/A	N/A
		aws-centos7-aem64	N/A	N/A	N/A
		aws-centos7-aem65	N/A	N/A	N/A
		aws-rhel7-aem62	N/A	N/A	N/A
		aws-rhel7-aem63	N/A	N/A	N/A
		aws-rhel7-aem64	N/A	N/A	N/A
		aws-rhel7-aem65	N/A	N/A	N/A



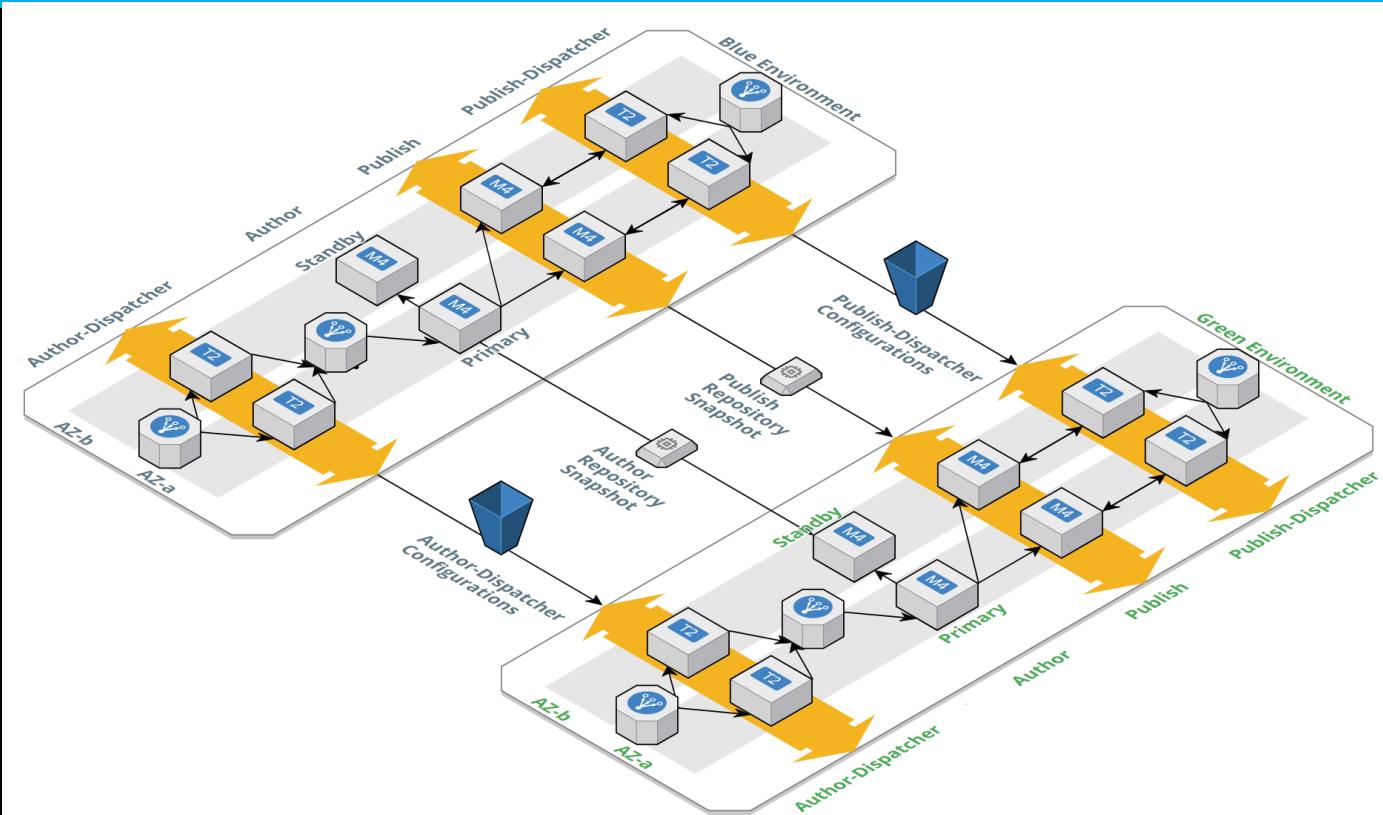
AEM Environment Architectures

AEM Full-Set Architecture



- Prod/
Pre-prod
environment
- Auto recovery
- Auto scaling

Blue/Green Deployment

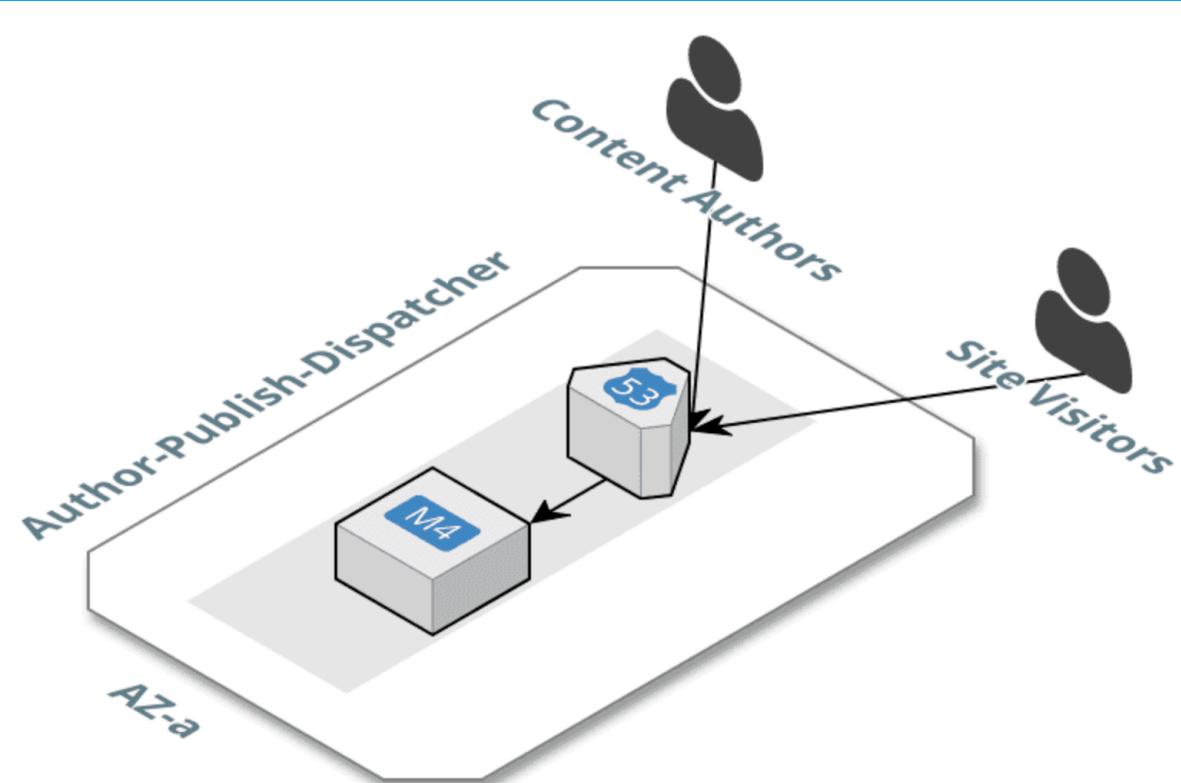




Multi-Level Backup

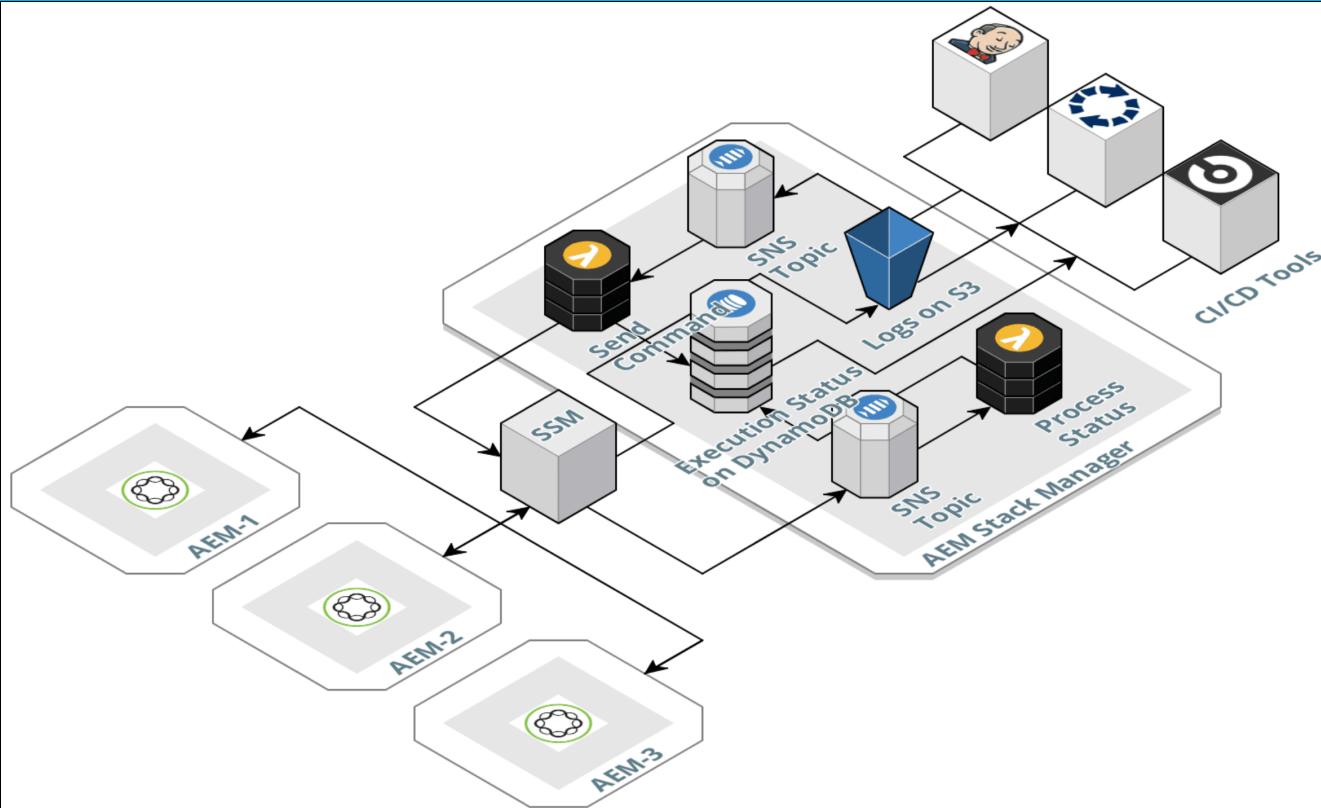
- **AEM Package backup**
Export descriptor
- **Live AWS EBS snapshot**
AEM up and running, speed up next snapshot
- **Offline AWS EBS snapshot**
AEM stopped, orchestrated

AEM Consolidated Architecture



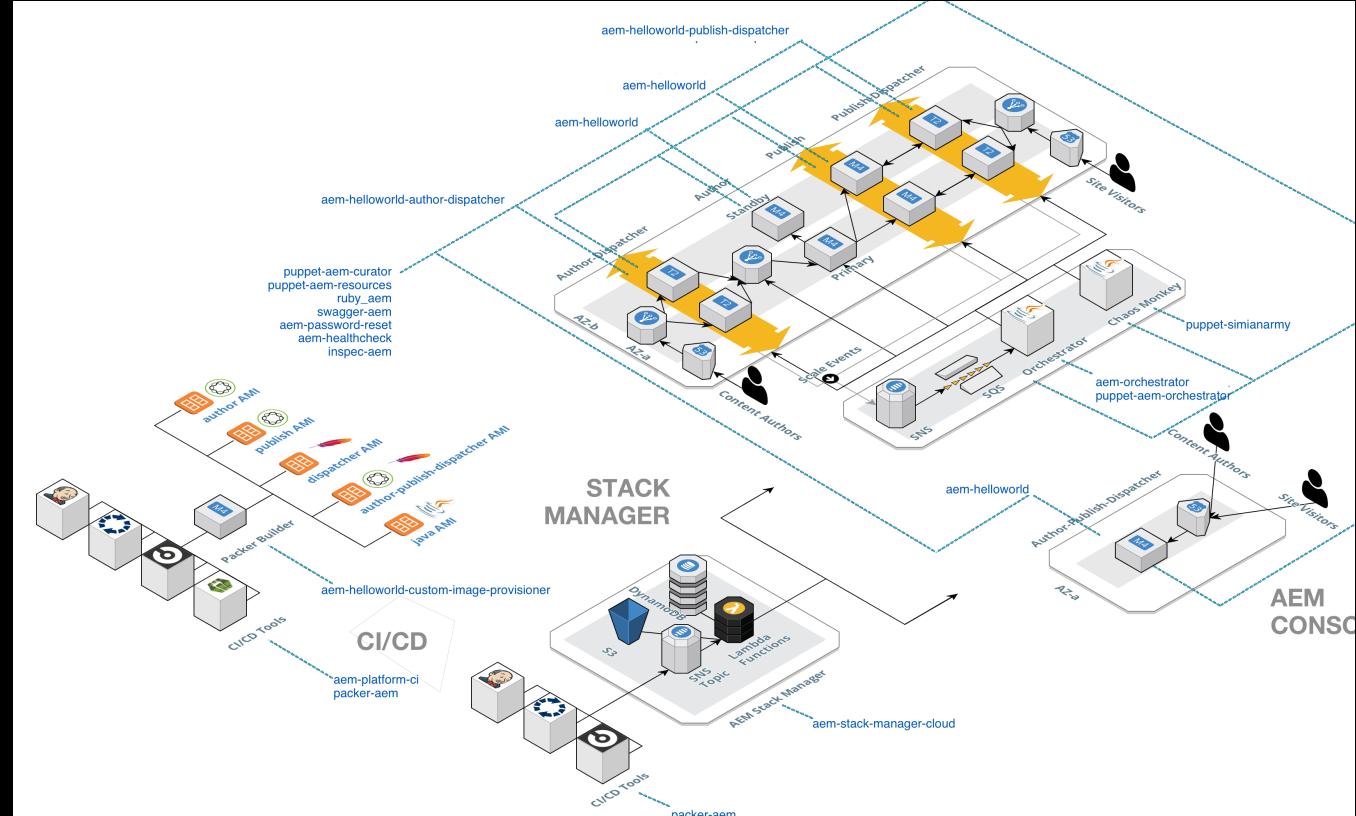
- Dev/Test environment
- Low footprint
- Low cost
- Branch regression

AEM Stack Manager



- Message broker
- Environment management
- AWS SSM

AEM OpenCloud Ecosystem





Demo - Manage Environments Screen

Manage environments

All +

S	W	Name ↓	Last Success	Last Failure	Last Duration
		aem-consolidated-amazon-linux2-aem62	N/A	N/A	N/A
		aem-consolidated-amazon-linux2-aem63	N/A	N/A	N/A
		aem-consolidated-amazon-linux2-aem64	N/A	N/A	N/A
		aem-consolidated-amazon-linux2-aem65	N/A	N/A	N/A
		aem-consolidated-rhel7-aem62	N/A	N/A	N/A
		aem-consolidated-rhel7-aem63	N/A	N/A	N/A
		aem-consolidated-rhel7-aem64	N/A	N/A	N/A
		aem-consolidated-rhel7-aem64-saml	N/A	N/A	N/A
		aem-consolidated-rhel7-aem65	N/A	N/A	N/A
		aem-full-set-amazon-linux2-aem62	N/A	N/A	N/A



Operational Tasks



Tasks

- Deploy packages
- Export/import package
- Flush cache
- Check environment readiness
- Create snapshots
- Trigger offline compaction



More tasks

- Enable/disable SAML
- Enable/disable CRXDE
- Promote Author Standby to Primary



Deployment Descriptor

```
"author-primary": {  
    "packages": [  
        {  
            "source": "http://central.maven.org/maven2/com/shinesolutions/aem-helloworld-content/0.0.1/aem-helloworld-content-0.0.1.jar",  
            "group": "shinesolutions",  
            "name": "aem-helloworld-content",  
            "version": "0.0.1",  
            "replicate": false,  
            "activate": false,  
            "force": false  
        }  
    ]  
},
```



Demo - Operational Tasks Screen

All

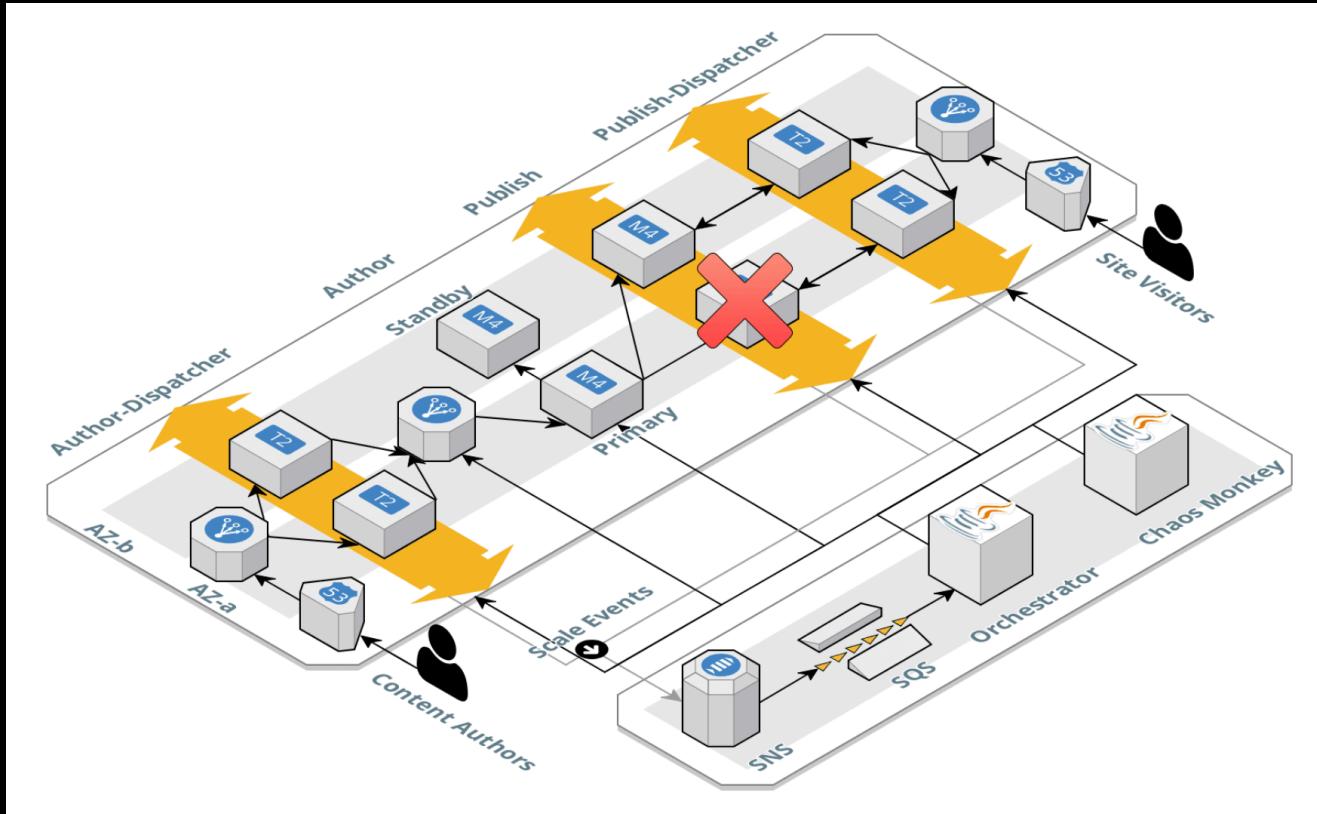
+

S	W	Name ↓	Last Success	Last Failure	Last Duration	
		check-readiness-consolidated	N/A	N/A	N/A	
		check-readiness-full-set	N/A	N/A	N/A	
		deploy-artifact	N/A	N/A	N/A	
		deploy-artifacts-consolidated	N/A	N/A	N/A	
		deploy-artifacts-full-set	N/A	N/A	N/A	
		disable-crxde	N/A	N/A	N/A	
		disable-saml	N/A	N/A	N/A	
		enable-crxde	N/A	N/A	N/A	
		enable-saml	N/A	N/A	N/A	
		export-packages-consolidated	N/A	N/A	N/A	



Platform Testing

Chaos Monkey - Continuous Recovery Testing





AEM Test Suite - Security Guideline Testing

Profile: AEM security InSpec profile (aem-security)

Version: 0.9.0

Target: local://

- ✓ publish-dispatcher-prevent-clickjacking: Check clickjacking prevention setup
 - ✓ httpd should have response header with value "X-Frame-Options", "SAMEORIGIN"
- ✓ publish-dispatcher-deny-administrative-urls: Check access to administrative URLs is denied
 - ✓ httpd should have path with status code "/admin\n", 404
 - ✓ httpd should have path with status code "/system/console\n", 404
 - ✓ httpd should have path with status code "/dav/crx.default\n", 404
 - ✓ httpd should have path with status code "/crx\n", 404
 - ✓ httpd should have path with status code "/bin/crxde/logs\n", 404
 - ✓ httpd should have path with status code "/jcr:system/jcr:versionStorage.json\n", 404
 - ✓ httpd should have path with status code "/_jcr_system/_jcr_versionStorage.json\n", 404
 - ✓ httpd should have path with status code "/libs/wcm/core/content/siteadmin.html\n", 404
 - ✓ httpd should have path with status code "/libs/collab/core/content/admin.html\n", 404
 - ✓ httpd should have path with status code "/libs/cq/ui/content/dumplibs.html\n", 404
 - ✓ httpd should have path with status code "/var/linkchecker.html\n", 404
 - ✓ httpd should have path with status code "/etc/linkchecker.html\n", 404
 - ✓ httpd should have path with status code "/home/users/a/admin/profile.json\n", 404
 - ✓ httpd should have path with status code "/home/users/a/admin/profile.xml\n", 404
 - ✓ httpd should have path with status code "/libs/cq/core/content/login.json\n", 404



AEM Test Suite - Recovery Testing

Profile: AEM-AWS InSpec profile (aem-aws)

Version: 1.3.0

Target: local://

```
[38;5;41m ✓ terminate-random-author-dispatcher-instance: Terminate a random Author Dispatcher instance [0m
```

```
[38;5;41m ✓ recovery should have terminated a random author dispatcher instance [0m
```

```
[38;5;41m ✓ recover-from-author-dispatcher-termination: Recover from Author Dispatcher instance termination [0m
```

```
[38;5;41m ✓ recovery should be able to recover from author dispatcher termination [0m
```

Profile Summary: [38;5;41m2 successful controls [0m, 0 control failures, 0 controls skipped

Test Summary: [38;5;41m2 successful [0m, 0 failures, 0 skipped

inspec exec . --show-progress --controls=\

```
terminate-random-publish-dispatcher-instance \
recover-from-publish-dispatcher-termination
```

..



AEM Test Suite - Blue/Green Testing



Demo - Platform Testing



aem-full-set-rhel7-aem65

Folder name: aem-opencloud-4.1.0-pre.6/testing/aws/aem-full-set-rhel7-aem65-sandpit-sandpit-aem-stack-manager-sandpit
AEM OpenCloud configuration profile Jenkins folder provisioned with AEM OpenCloud Manager.

S	W	Name ↓	Last Success	Last Failure	Last
		full-set-blue-green	N/A	N/A	N/A
		full-set-platform	N/A	N/A	N/A
		full-set-recovery	N/A	N/A	N/A
		promote-author-standby-full-set	N/A	N/A	N/A

Icon: [S](#) [M](#) [L](#)

[Legend](#) [RSS for all](#) [RSS for failures](#)

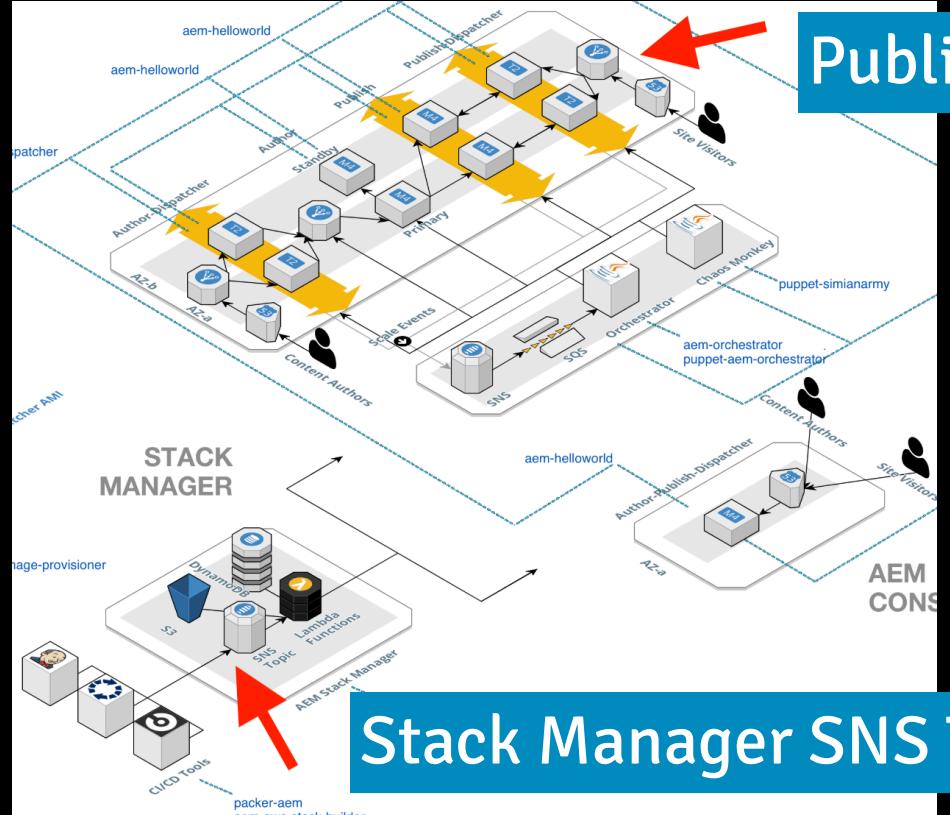


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Security



Minimal blast radius



Publish-Dispatcher ELB

Stack Manager SNS Topic



Security Features

- Unique system user passwords per AEM environment
- First class SAML configuration
- EBS volume encryption at rest
- Customisable load balancer cipher suite
- SSL communications between AEM components



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Monitoring



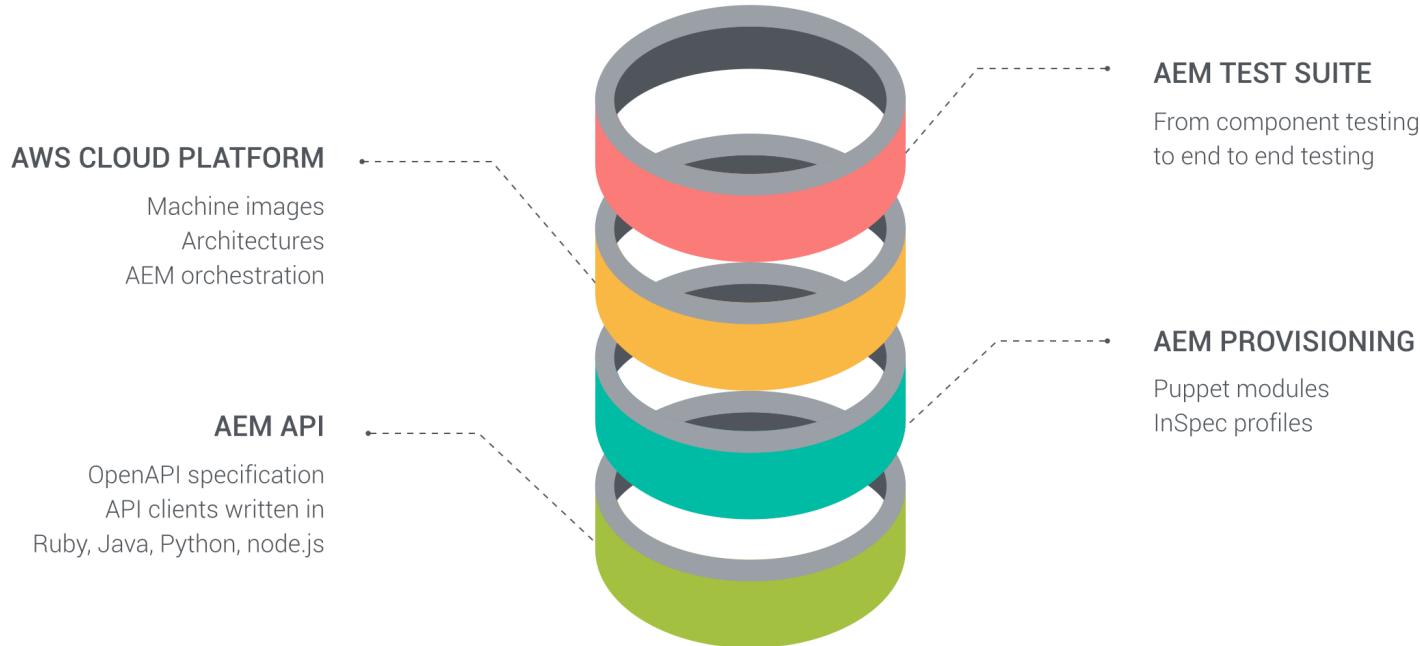
Monitoring

- Collectd: JMX beans to CloudWatch metrics
- CloudWatch alarms with SNS topics
- CloudWatch logs
- CloudWatch dashboards

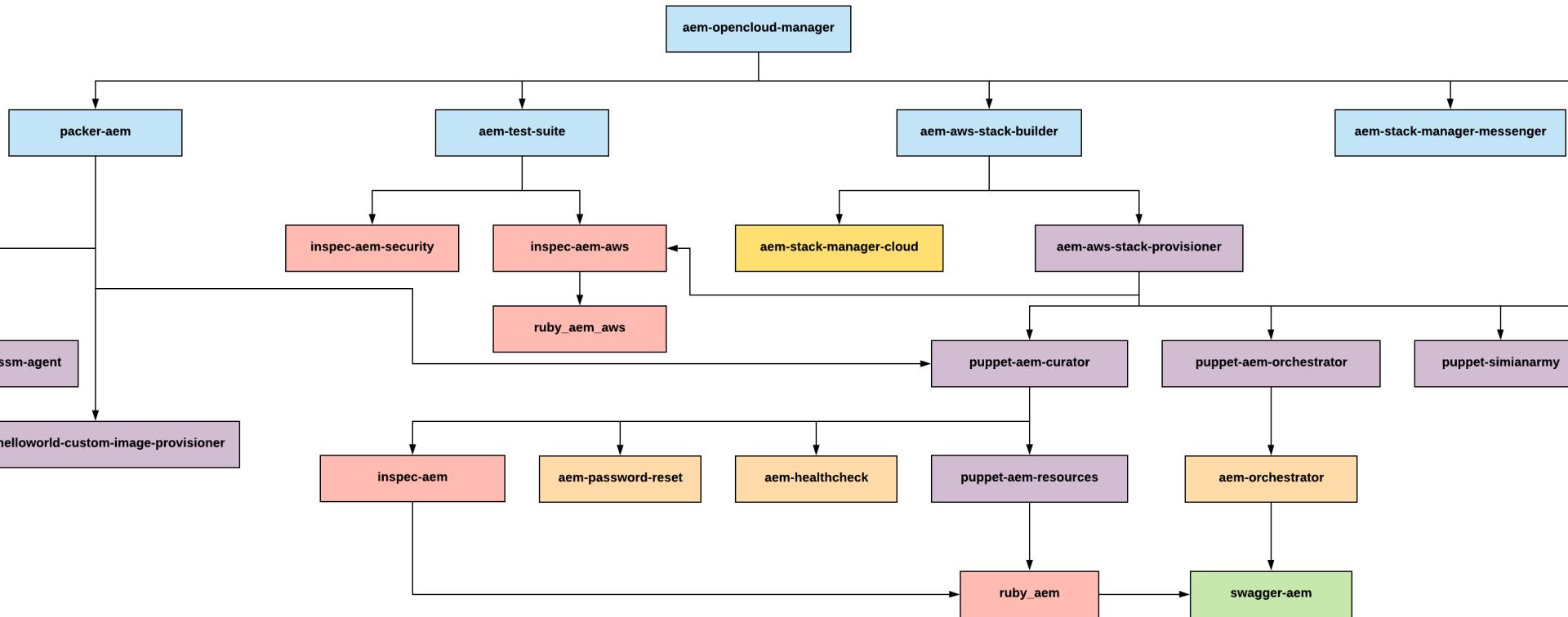


Modular Design

Layers of libraries



Code repositories





Where do we go from here?

AEM OpenCloud aims to provide the community with an open platform to run AEM environments which can be operated within the users' perimeter.

You are welcome to use and contribute :)

Find us on <https://aemopencloud.io>

Join us on LinkedIn AEM OpenCloud group

<https://www.linkedin.com/groups/13649198/>

We also hang out on AEM-Tech Slack group

(look for Cliffano Subagio or Michael Bloch)

<https://aem-tech.slack.com/>



Thank you :) + Q&A



Links

- <https://aemopencloud.io/>
- <https://www.linkedin.com/groups/13649198/>
- <https://www.slideshare.net/cliffano/aem-opencloud>
- <https://github.com/shinesolutions/aem-opencloud-manager>
- <https://github.com/shinesolutions/packer-aem/>
- <https://github.com/shinesolutions/aem-aws-stack-builder/>
- <https://github.com/shinesolutions/aem-stack-manager-messenger>
- <https://github.com/shinesolutions/aem-test-suite/>



Images

- <https://shinesolutions.github.io/aem-opencloud/images/repositories-dependencies.png>
- <https://shinesolutions.github.io/aem-opencloud/images/repositories-map.png>
- <https://raw.githubusercontent.com/shinesolutions/aem-aws-stack-builder/master/docs/architecture-full-set.png>
- <https://raw.githubusercontent.com/shinesolutions/aem-aws-stack-builder/master/docs/architecture-consolidated.png>
- <https://raw.githubusercontent.com/shinesolutions/aem-aws-stack-builder/master/docs/architecture-stack-manager.png>
- <https://raw.githubusercontent.com/shinesolutions/aem-aws-stack-builder/master/docs/communication-flow-full-set.png>