Get ready for the Cloud! - AEM Cloud Service Migration Best Practices

Andreea Moise, Adobe

Andreea Moise

Sr. Software Engineer @ Adobe Bucharest

https://twitter.com/pudelyna

The Benefits

1 Always On

Best in class service level	No content freeze or downtime
Protection against cloud disasters and failures	Robust on-demand data storage

2 Always Current

Continuous access to the latest innovations	Automated rolling product updates

3 Always at Scale

|	
Ensure performance during peak hours of traffic by visitor and users	Auto-scaling (publish & author)
Faster rendering and processing of 100%-pixel quality assets	Microservices for assets ingestion and processing

4 Always Learning

Always up-to-date with performance enhancements and security updates	Automated corrective updates
Intelligence and machine learning by default	Native access to Sensei intelligence

The Journey

Planning

Execution

Post Go-live

Transfer

Refactor

Go-live
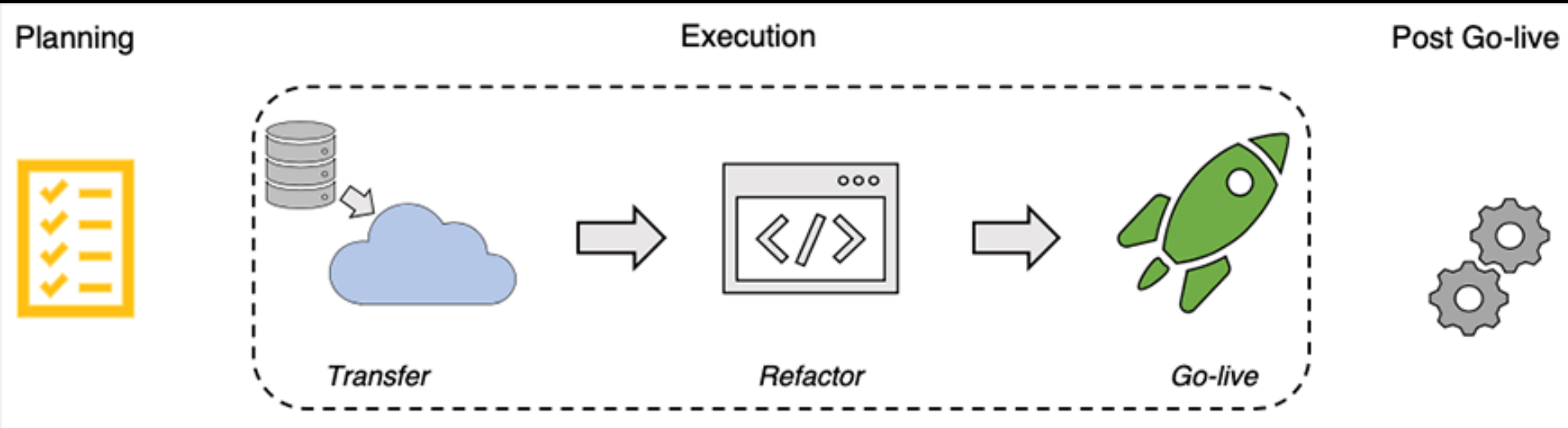
Planning

Steps

Cloud Service Readiness

- **Cloud Readiness Analyzer** - Areas that require refactoring

- **Cloud Manager code quality pipeline** - Your current AEM source code against the changes and deprecated features in AEMaaCS

The Changes in AEMaaCS

CHANGED

Immutable /apps and /libs

Repository-based OSGI bundles

Publish-Side Delivery

Asset Handling and Delivery

GONE

Replication Agents

Classic UI

Custom Runmodes

Changes to publish repository

Cloud Readiness Analyzer

Refresh Report

Download Report as: **CSV**

Report Time: Tue, 16 Jun 2020 16:37:33 PDT
Expiration Time: Wed, 17 Jun 2020 16:37:33 PDT
Generation Time Period: 0 hr 00 min 41 sec
Finding Count: 267

This report provides a summary of findings from the Cloud Readiness Analyzer. The following sections describe the findings of the readiness analysis. The findings are organized by type and presented with a description and the number of findings for each type.

? Help

System Overview

AEM Version: 6.5.3.0
Asset Count: 305
Authorizable Count: 233
Page Count: 1826
Tag Count: 75
AEM Companion Products:
Assets, Sites
Documentation URL:
https://www.adobe.com/go/aem_pd_ASO

Some AEM products may not be currently supported in AEM as a Cloud Service. Please contact your Adobe representative for information about future support.

Content Area Violation

MAJOR Items Found: 177 ⓘ

Content has been detected which uses another content area through overlays, overrides, or references in a way that violates the rules of the content classification.
Documentation URL: https://www.adobe.com/go/aem_pd_CAV

⬆ Showing 5 rows of 177. Click to show all rows.

Path	Message
/apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content	The path: /apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content violates content areas resource type usage internal path: /libs/granite/ui/components/coral/foundation/container
/apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content/items/tabs	The path: /apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content/items/tabs violates content areas resource type usage internal path: /libs/granite/ui/components/coral/foundation/tabs
/apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content/items/tabs/items/allowedcomponents	The path: /apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content/items/tabs/items/allowedcomponents violates content areas resource type usage internal path: /libs/granite/ui/components/coral/foundation/container
/apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content/items/tabs/items/properties	The path: /apps/core/wcm/components/accordion/v1/accordion/cq:design_dialog/content/items/tabs/items/properties violates content areas resource type usage internal path: /libs/granite/ui/components/coral/foundation/container

STAGE DEPLOYMENT

Validation

Your Pipeline has been verified against a set of pre-defined rules.

✅ *Passed (Finished: July 23, 2020 10:01:49 AM GMT+3)*

Build & Unit Testing

Your application code has been tested for quality and compiled into build artifacts

BRANCH: MASTER

VERSION:2020.526.121154.0000102041

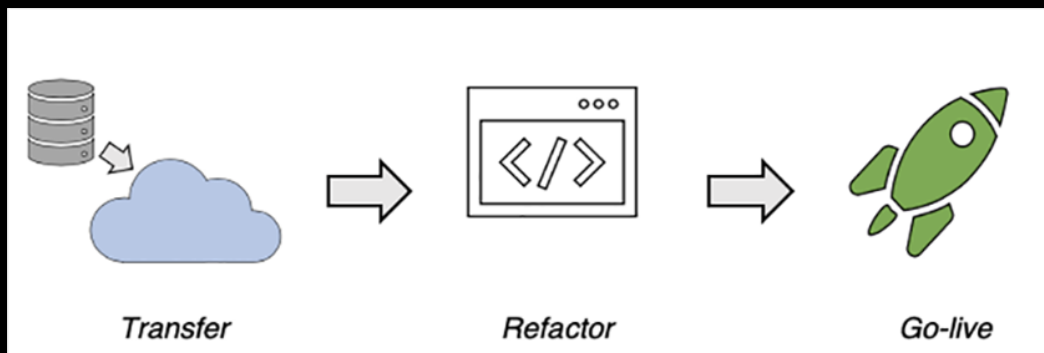(Download Log) ✅ *Succeeded (Finished: July 23, 2020 10:07:50 AM GMT+3)*

Sling Scheduler

Hardcoded /apps and /libs

HTTP timeouts

AEM Deprecated APIs

Closed ResourceResolver

Sling Servlet paths

@ProviderType

ClassicUI
Mutable Content
/libs
Duplicate OSGI Configs
Reverse Replication
Touch UI Dialogs
Immutable Content

Execution

Steps

Transfer   Refactor   Go-live
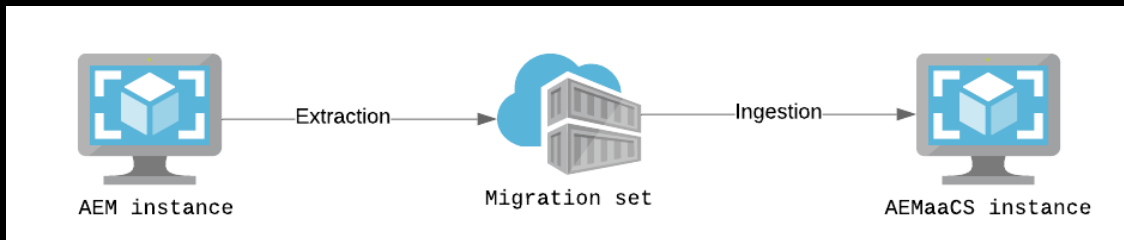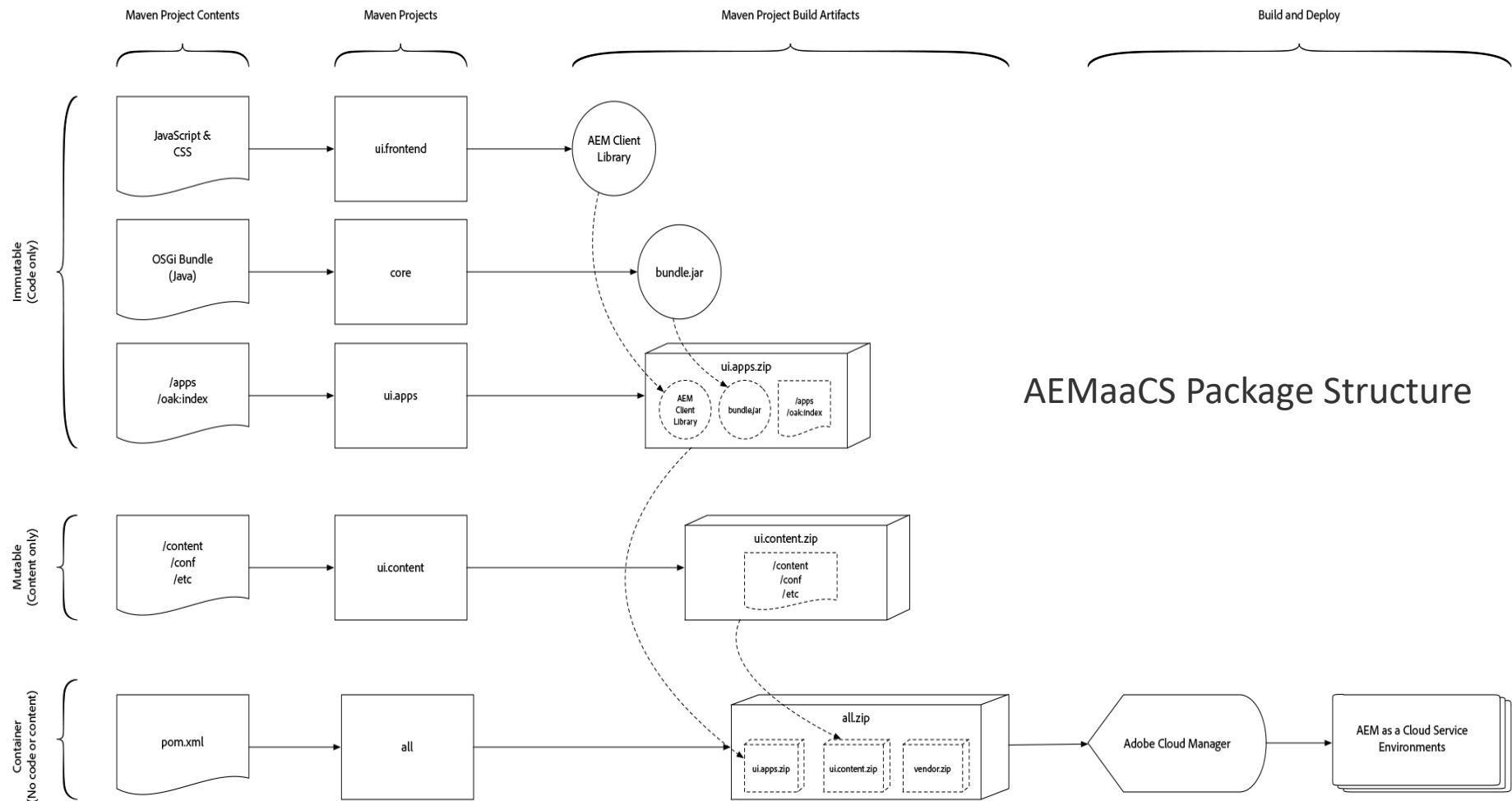
- **WHAT?**

  Existing content and principals (users or groups) from a source AEM instance (on-premise or AMS) to the target AEMaaCS instance
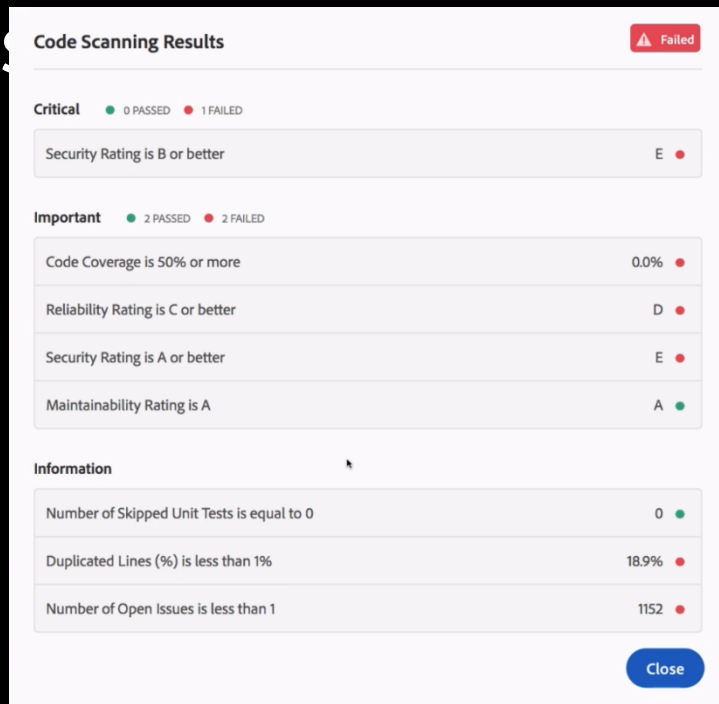
- **HOW?**

Maven Project Contents   **Maven Projects**   **Maven Project Build Artifacts**   **Build and Deploy**

Immutable (Code only)

- JavaScript & CSS → ui.frontend → AEM Client Library
- OSGi Bundle (Java) → core → bundle.jar
- /apps /oak:index → ui.apps → ui.apps.zip (AEM Client Library, bundle.jar, /apps /oak:index)

Mutable (Content only)

- /content /conf /etc → ui.content → ui.content.zip (/content /conf /etc)

Container (No code or content)

- pom.xml → all → all.zip (ui.apps.zip, ui.content.zip, vendor.zip) → Adobe Cloud Manager → AEM as a Cloud Service Environments

AEMaaCS Package Structure

- **Asset Workflow Migration**

- **AEM Dispatcher Converter**

- **AEM Modernization Tools**

  - Static templates to editable templates
  - Design configurations to policies
  - Foundation Components to Core Components
  - Classic UI to Touch-Enabled UI

■ **Code Quality Testing Ratings**

- ■ Security rating   < B
- ■ Reliability rating   < C
- ■ Maintainability rating   < A
- ■ Coverage   < 50%
- ■ Skipped Unit Tests   > 1
- ■ Open Issues   > 0
- ■ Duplicated Lines   > 1%
- ■ Cloud Service compatibility > 0
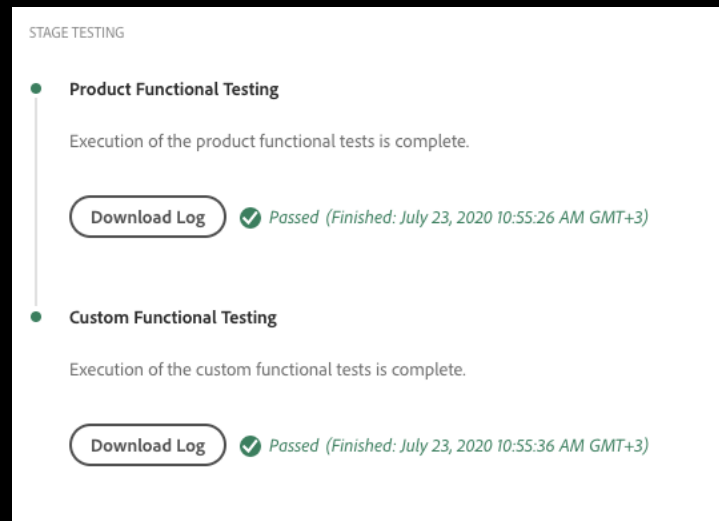
Code Scanning Results   ⚠ Failed

Critical   ● 0 PASSED   ● 1 FAILED

Security Rating is B or better   E ●

Important   ● 2 PASSED   ● 2 FAILED

Code Coverage is 50% or more   0.0% ●

Reliability Rating is C or better   D ●

Security Rating is A or better   E ●

Maintainability Rating is A   A ●

Information

Number of Skipped Unit Tests is equal to 0   0 ●

Duplicated Lines (%) is less than 1%   18.9% ●

Number of Open Issues is less than 1   1152 ●

Close

Custom Functional Testing

- packaged as a separate JAR file
- class names of the actual tests

to be executed must end in IT

```xml
<!-- Create self-contained jar with dependencies -->
<plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-assembly-plugin</artifactId>
    <version>3.1.0</version>
    <configuration>
        <descriptorRefs>
            <descriptorRef>jar-with-dependencies</descriptorRef>
        </descriptorRefs>
        <archive>
            <manifestEntries>
                <Cloud-Manager-TestType>integration-test</Cloud-Manager-TestType>
            </manifestEntries>
        </archive>
        …
</plugin>
```
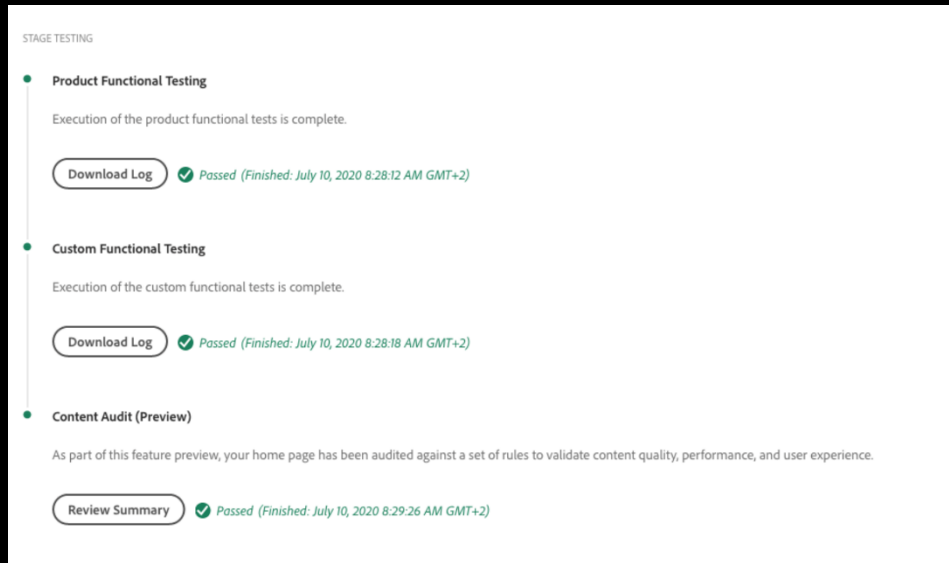
▪ Content Audit Testing

- ▪ Lighthouse checks
- ▪ Tests
- ▪ Scores and Score Variability
- ▪ Guidance

STAGE TESTING

Product Functional Testing

Execution of the product functional tests is complete.

Download Log ✓ Passed (Finished: July 10, 2020 8:28:12 AM GMT+2)

Custom Functional Testing

Execution of the custom functional tests is complete.

Download Log ✓ Passed (Finished: July 10, 2020 8:28:18 AM GMT+2)

Content Audit (Preview)

As part of this feature preview, your home page has been audited against a set of rules to validate content quality, performance, and user experience.

Review Summary ✓ Passed (Finished: July 10, 2020 8:29:26 AM GMT+2)

vlad-prod-test

Program Overview > **Production Pipeline** Finished

- Stage deployment
- Stage testing
- Production deployment

Content Audit

✓ Passed

Information   ● 4 PASSED   ● 1 FAILED   Current   Change

	Current	Change
> Accessibility Score is 80 or above for all audited pages	86 ●	+4
> SEO Score is 80 or above for all audited pages	88 ●	-2
∨ Performance Score is 80 or above for all audited pages	94 ●	+40

● 1 PASSED   ● 0 FAILED   Current   Details   Change

	Current	Details	Change
https://publish-p13907-e29814.adobeaemcloud.com/	94	🗎	+40

	Current	Change
> Best Practices Score is 80 or above for all audited pages	100 ●	+8
> PWA Score is 80 or above for all audited pages	52 ●	-4

Generated by Lighthouse 6.0.0

Close

t quality, performance, and user experience.

Deployment complete.

Download Log   ✓ Completed (Finished: July 10, 2020 8:39:58 AM GMT+2)

Stage deployment

Stage testing

Production deployment

Content Audit

Back   Print

🔒 https://wknd.site/content/wknd/us/en.html

54   82   92   90   —

54

Performance

Metrics

⚠ First Contentful Paint	2.0 s	■ Time to Interactive	2.6 s
⚠ Speed Index	2.4 s	● Total Blocking Time	120 ms
⚠ Largest Contentful Paint	6.2 s	● Cumulative Layout Shift	0.008

Close

Deploy to Production

Deployment complete.

Go-Live

- Schedule code and content freeze period

- Perform final content top-up

- Complete testing iterations

- Run performance and security tests

- Always create a **fallback plan**

- Cut-Over

Summary

- How to plan a migration to Cloud Service
- How to execute it by
    - Content transfer
    - Codebase refactoring
- How to have a successful Go-Live

Q&A

Appendix

Custom Code Quality rules - SonarQube

- HTTP requests should always have socket and connect timeouts
- Product APIs annotated with @ProviderType should not be implemented or extended by customers
- ResourceResolver objects should always be closed
- Do not use Sling servlet paths to register servlets
- Logging and exception handling rules
- Avoid Hardcoded /apps and /libs Paths
- Sling Scheduler Should Not Be Used
- AEM Deprecated APIs Should Not Be Used

Custom Code Quality rules - OakPAL

- Customer Packages Should Not Create or Modify Nodes Under /libs

- Packages Should Not Contain Duplicate OSGi Configurations

- Config and Install Folders Should Only Contain OSGi Nodes

- Packages Should Not Overlap

- Default Authoring Mode Should Not Be Classic UI

- Components With Dialogs Should Have Touch UI Dialogs

- Packages Should Not Mix Mutable and Immutable Content

- Reverse Replication Agents Should Not Be Used

- State in Memory

- State on the Filesystem

- Observation

- Background Tasks and Long Running Jobs

- Outgoing HTTP Connections

- No Classic UI Customizations

- Avoid Native Binaries

- No Streaming Binaries through AEM as a Cloud Service

- No Reverse Replication Agents

- Forward Replication Agents Might Need to be Ported

- AEMaaCS logs available through Cloud Manager

- CRXDE lite available on the development environment but not on stage or production

Resources

- [AEMaaCS Architecture](#)
- [AEMaaCS Archetype](#)
- [Asset Workflow Migration Tool](#)
- [Dispatcher Converter Tool](#)
- [AEM Modernization Tools](#)
- https://github.com/adobe/aem-testing-clients
- https://github.com/adobe/aem-test-samples