



ArgoCon

Migrating CI/CD from Jenkins to Argo

Caelan Urquhart - Pipekit | Bertrand Quenin - Intuit



INTUIT

turbotax

creditkarma

quickbooks

mailchimp

#ArgoCon

November 6, 2023

INTROS



Caelan Urquhart

Co-founder, CEO @ Pipekit.io

- Contributor on the Argo Workflows project
- **Focus:** Data & CI pipeline architecture and product development



Bertrand Quenin

Staff Software Engineer @ Intuit

- Battle tested Software Engineer with 20+ years of experience
- **Focus:** Designing cloud native solutions at scale

GOALS FOR THE TALK



Understand the challenges of using Jenkins on Kubernetes



Learn how Argo Workflows is used for CI at scale alongside Argo CD



Compare how Jenkins and Argo Workflows work for cloud-native CI



Understand what to consider before migrating from Jenkins to Argo Workflows

AI-driven expert platform

Intuit is leading the way in building an AI-native development platform using cloud native open source technology. We're committed to building tools that scale and giving back to the open source community.

INTUIT



North America 2023



Modern Dev
Experience



AI
Infrastructure



Data
Integration



Fintech
Infrastructure



Identity

INTUIT



100%

services on
Modern SaaS

65B

machine learning
predictions per day

24k

financial institutions
[+50 crypto]

\$560B

money moved

3.6B

requests during
peak season (no
customer failures)



ArgoCon

CI/CD AT INTUIT

INTUIT



North America 2023

Intuit Build Platform

Enables Intuit engineers to build and deploy their code in a fast, secure, and compliant fashion – running Jenkins on Kubernetes.



~150

Kubernetes Nodes

6000

Developers

>100k

Builds Per Day

~400k

Jenkins Jobs

~200

Jenkins Servers

~1500

Jenkins Agents

CHALLENGES WITH JENKINS

INTUIT



CloudNativeCon

North America 2023

- Lack of insights needed for troubleshooting
- The more jobs on Jenkins, the slower it gets
- Failing over takes up to an hour
- Plugin updates and permissions management
- No unified control plane, Jenkins instances are pets
- Not cloud-native – Resource utilization is suboptimal

BACKGROUND



CI at Pipekit

- **Pipekit is a control plane for Argo Workflows**
 - Manage pipelines from one UI
 - Run multi-cluster workflows
 - Granular RBAC, SSO
- **We want lean and adaptable CI pipelines**
 - Easy to iterate & remix pipelines
 - Autoscale to minimize costs
 - “Set it and forget it” with CI
 - Integrate with Argo CD

Challenges with Jenkins

- Running CI for PRs took too long
- Running all containers in one pod ...
 - Limited the pipeline size
 - Wasted cloud resources
- Maintaining several plugins became a full-time job
- Leveraging spot nodes wasn't user friendly
 - No high-availability mode in Jenkins OSS



ArgoCon

CLOUD-NATIVE CI REQUIREMENTS

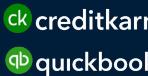
INTUIT



turbotax



mailchimp



creditkarma



quickbooks

CI at Intuit

- Improved Developer Experience
- High Availability / Scalability
- Unified Control Plane
- Kubernetes Native
- Cost effective



pipekit

CI at Pipekit

- Easy to iterate & remix pipelines for new requirements
- Take full advantage of autoscaling to minimize cloud costs
- Minimize maintenance

WHY ARGO WORKFLOWS FOR CI

Argo Workflows is a container-native pipeline orchestrator.



Argo Workflows

One step, one pod

Dynamically provision and
autoscale pods

Parallelism by default

Lightweight to deploy and
maintain

Seamless integration with
Argo CD, Rollouts & Events

Use YAML or Python to
define workflows



ArgoCon

JENKINS VS. ARGO WORKFLOWS FOR CI

PROS



Jenkins

- Tons of documentation & community knowledge
- Plugins make it easy to get started
- Handles passing objects between steps automatically
- UI and DSL are familiar to developers



Argo Workflows

- One step, one pod by default
- Autoscaling by default
- Parallelism enabled by default
- High-availability by default
- Retry logic supports spot nodes natively
- Option to run multiple containers in one pod if required
- Use YAML or Python to define workflows

CONS

- Runs all containers in one pod by default
- Resources for each pipeline step aren't autoscaled
- Maintaining plugins creates overhead
- No native support for spot nodes

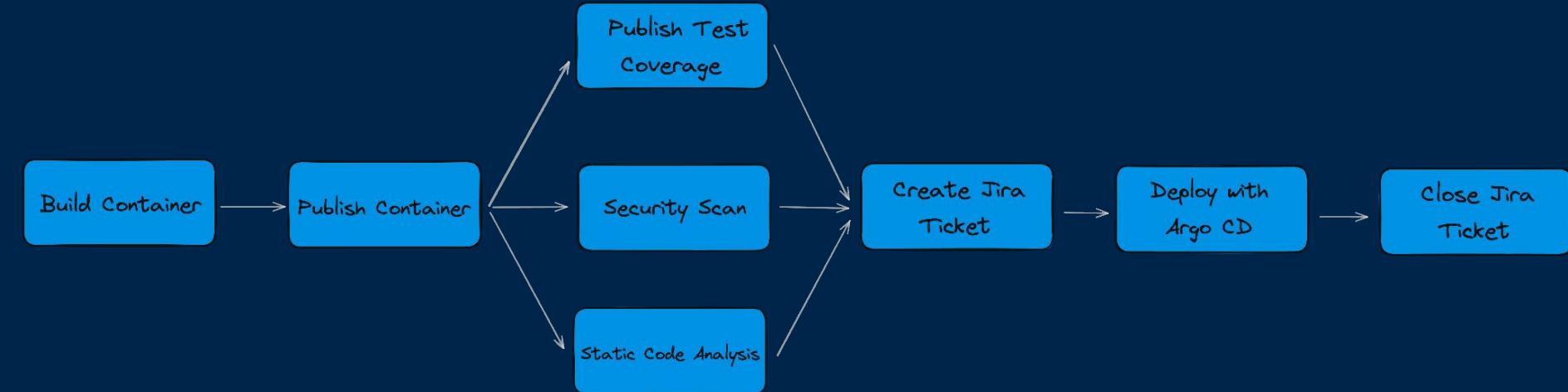
- Passing objects between steps requires extra setup effort
- UI is designed to be generic and support many use cases, besides CI

JENKINS VS. ARGO WORKFLOWS FOR CI

Jenkins	Argo Workflows
Jenkinsfile (Groovy)	Workflow definition (YAML, Python)
Step	Task
Stage	Template (DAG, steps, container, script, etc.)
Replay	Resubmit
Jenkins plugins	Exit handlers (for pushing to 3rd party tools) Argo Workflows Plugins (not built like Jenkins plugins)
Shared Library	WorkflowTemplates
Credentials plugin(s)	Integrate 3rd-party K8s-native tools Secrets managed separately from user credentials



CI/CD PIPELINE EXAMPLE



COMPARING JENKINS & ARGO WORKFLOWS FOR CI/CD



<https://s.pipekit.io/jenkins-to-argo>

talk-demos / argocon-demos / 2023-migrating-cicd-from-jenkins-to-argo / ⌂

caelan-io fix: Update Jenkins argo talk (#21) ⚙

Name	Last commit message
...	
jenkins-vs-argo-workflows-comparison	fix: Update Jenkins argo talk (#21)
README.md	feat: jenkins-workflow talk (#18)

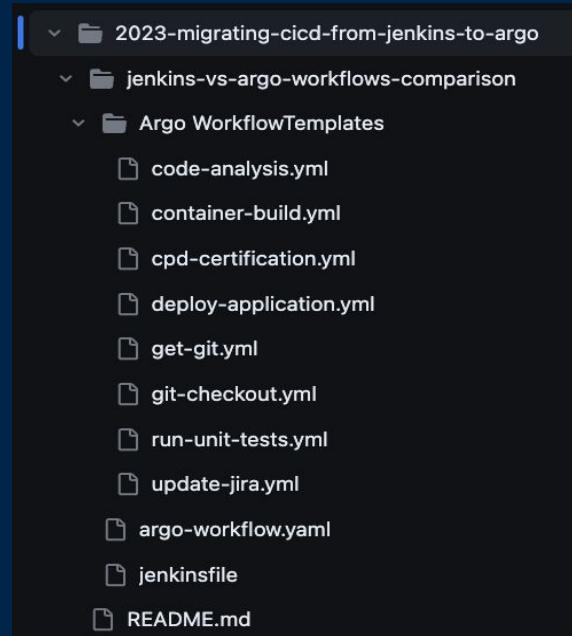
README.md

Migrating CI/CD from Jenkins to Argo ↗

COMPARING JENKINS & ARGO WORKFLOWS FOR CI/CD



<https://s.pipekit.io/jenkins-to-argo>



MIGRATION TIPS



ArgoCon

MIGRATION TIPS

ACTUALLY

THERE'S A BETTER WAY



Migration Tips

Run Argo Workflows alongside Jenkins

- Trigger Argo Workflows jobs with Jenkins
- Write Argo Workflows jobs for greenfield pipelines & projects

Start with simple CI tasks

- Automated tests
- Simple container builds

RESOURCES & NEXT STEPS

Try Argo Workflows for CI

- Jenkins & Argo Workflows side-by-side example:
<https://s.pipekit.io/jenkins-to-argo>
- CI/CD example with Argo Workflows & CD:
<https://github.com/pipekit/argo-workflows-ci-example>



FREE THINGS

- Free trial cluster from Pipekit to try Argo for CI:
<https://s.pipekit.io/ci-free-trial>
- Example workflows (and Hera workflows) to run
on your free trial cluster:
<https://s.pipekit.io/argo-wf-examples>



Stay in the loop

FOLLOW

Intuit Open Source

Don't miss on exciting OSS events, activities & news

Visit our Booth

Get some exciting OSS swag - while supplies last



Scan or visit
bit.ly/intuit-oss

Intuit □ Open Source



Check out
ARGO CD



Check out
ARGO ROLLOUTS

Q&A

Try Argo Workflows for CI

- Jenkins & Argo Workflows side-by-side example:
<https://s.pipekit.io/jenkins-to-argo>
- CI/CD example with Argo Workflows & CD:
<https://github.com/pipekit/argo-workflows-ci-example>

