10th UCAAT User Conference on Advanced Automated Testing

ETSI The Standards People

SDLC
Integrating GitOps and GitFlow Techniques on CNCF Native Applications

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Lasting software

15/11/2023

SDLC

Integrating GitOps and GitFlow Techniques on CNCF Native Applications

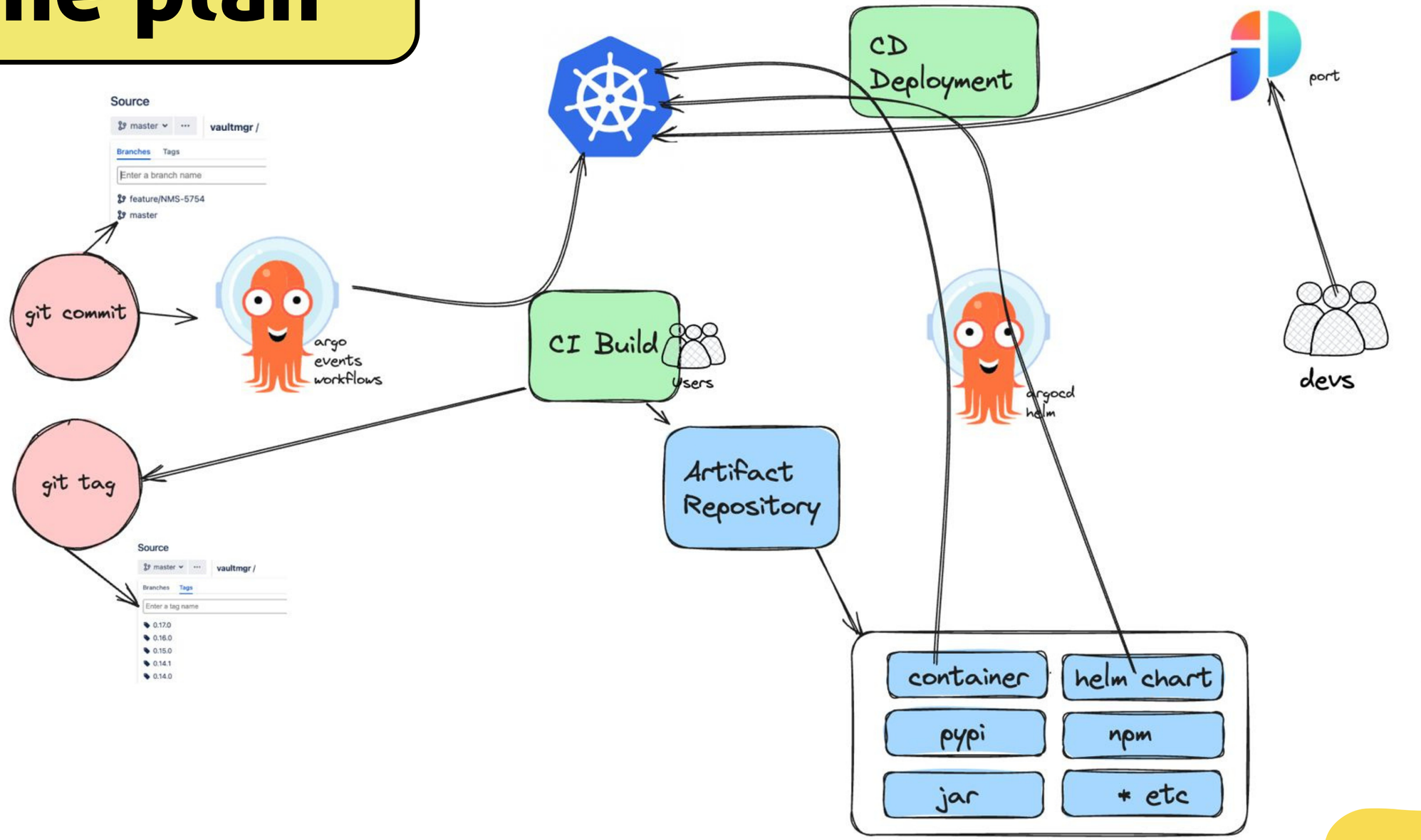
Losting software

The team

Ionel PETRUT

Marius CHISA

The plan


Source
master
vaultmgr /
Branches
Tags
Enter a branch name
feature/NMS-5754
master
git commit
argo
events
workflows
CD
Deployment
port
CI Build
users
devs
argocd
helm
git tag
Artifact
Repository
Source
master
vaultmgr /
Branches
Tags
Enter a tag name
0.17.0
0.16.0
0.15.0
0.14.1
0.14.0
container
helm chart
pypi
npm
jar
* etc

Content

Source / Versioning

- SemVer(semantic) became a middle ground for versioning: PEP440 and npm/helm compatible

ex: 1.0.0 (master), 0.0.0-<digitTicket> for feature/bugfix braches

- Use GIT! Bitbucket / Github (Enterprise) / Gitlab / Gitea, Gitolite, gogs
- Leverage Gitflow: feature/ bugfix/ release/ master branches
- lock version(dependencies) only when releasing master versions
- Use short-lived branches (target one sprint!)
- avoid epic branches -> headakes to rebase/merge
- use stable (run test on it) and unstable(not tested) artifact locations
- develop branch should exists until you have a release peace

(every quearter/epic)

Branching strategy

- include ticket number in the branch
- include feature/ bugfix/ release/ master (or main) -> GitFlow
- short lived branches
- use PR process
- trigger tests on PR
- increase PATCH on bugfix, MINOR on feature, leave MAJOR for software architect to increase
- easiest: use git tags

CI / Build

- try to use CNCF tools(build in K8s): Tekton / Argo (events/workflows) / kaniko / buildah / s2i if you app is CNCF native
- use old-school Jenkins if you only have this knowledge within team
- use DRY
- build artifacts, tag/version, push to artifact location
- build where you run: do not build with docker/compose run on containerd/K8s

Artifact management

- master version goes to unstable, run test if successfull push to stable
- stable build to reach QA team for manual/system tests
- Artifactory / Nexus / Harbor are good choices
- artifacts are docker images/helm charts/python plugins/npm packages etc

CD / Deployment

- use helm, if you are multiple environment kustomize might be a better fit
- ArgoCD graduated as CNCF deployment tool
- use external-secrets.io for secret management (You thought of security didn't you?)
- use Port (getport.io) to provide IDP Service Catalog type of functionality

Security

- container: start with ubi/bitnami etc provided images, less "forking" is better
- non-root/read-only fs, drop all privilleges by default > helm conftest to leverage in CI pipeline
- scan your artifacts against CVE: Anchor/Clair are good choices
- SonarQube for code quality, create gates -> software architect

Testing

- our choices(not necesary the best ones) are Pytest/Cypress
- ALM tool of choice is SpiraTeam for BA/PO engagement
- testing infrastructure consists of "simulators" and actual tests(pytest/cypress) in different microservices
- we use GraphQL for entrypoint in our testing infrastructure, kafka/postgres/elasticsearch/etc endpoint to compare
- report in SpiraTeam with #id, PO/BA would keep test coverage/feature/release tree up2date
- use a centralized debugger microservice for test advanced troubleshooting (ares?)

In action...

#consolelog

01

```
argo logs ci-p7bcm -f
ci-p7bcm-parameter-setup-4131408244: |-----------------------------------------|
ci-p7bcm-parameter-setup-4131408244: |                MASTER Build             |
ci-p7bcm-parameter-setup-4131408244: |-----------------------------------------|
ci-p7bcm-parameter-setup-4131408244: | PARAMETERS:           VALUES            |
ci-p7bcm-parameter-setup-4131408244: | Tag:                  0.13.0            |
ci-p7bcm-parameter-setup-4131408244: | Comment:              test              |
ci-p7bcm-parameter-setup-4131408244: | DeployDimensions:     false             |
ci-p7bcm-parameter-setup-4131408244: | RunFullTests          false             |
ci-p7bcm-parameter-setup-4131408244: | RunFrameworkTests:    false             |
ci-p7bcm-parameter-setup-4131408244: | RunNgpTests:          false             |
ci-p7bcm-parameter-setup-4131408244: | RunCypressTests:      false             |
ci-p7bcm-parameter-setup-4131408244: |-----------------------------------------|
```

02

```
ci-p7bcm-kaniko-build-3703766448: INFO[0035] Taking snapshot of full
filesystem...
ci-p7bcm-kaniko-build-3703766448: INFO[0036] Pushed
013914783300.dkr.ecr.us-east-
1.amazonaws.com/cache@sha256:aff9b49176e6e12c7a6e9107bf80f7362f4908aa0bb22
f92e070c09ec99abead
ci-p7bcm-kaniko-build-3703766448: INFO[0036] Pushing layer
013914783300.dkr.ecr.us-east-
1.amazonaws.com/cache:31314ec2e1638845e3800aa917d3d1fc030a964406827c0c3a42
7ac651a5cf53 to cache now
ci-p7bcm-kaniko-build-3703766448: INFO[0036] ENTRYPOINT ["/opt/app-
root/entrypoint.sh"]
ci-p7bcm-kaniko-build-3703766448: INFO[0036] Pushing image to
013914783300.dkr.ecr.us-east-
1.amazonaws.com/cache:31314ec2e1638845e3800aa917d3d1fc030a964406827c0c3a42
7ac651a5cf53
ci-p7bcm-kaniko-build-3703766448: INFO[0036] No files ch…
```

03

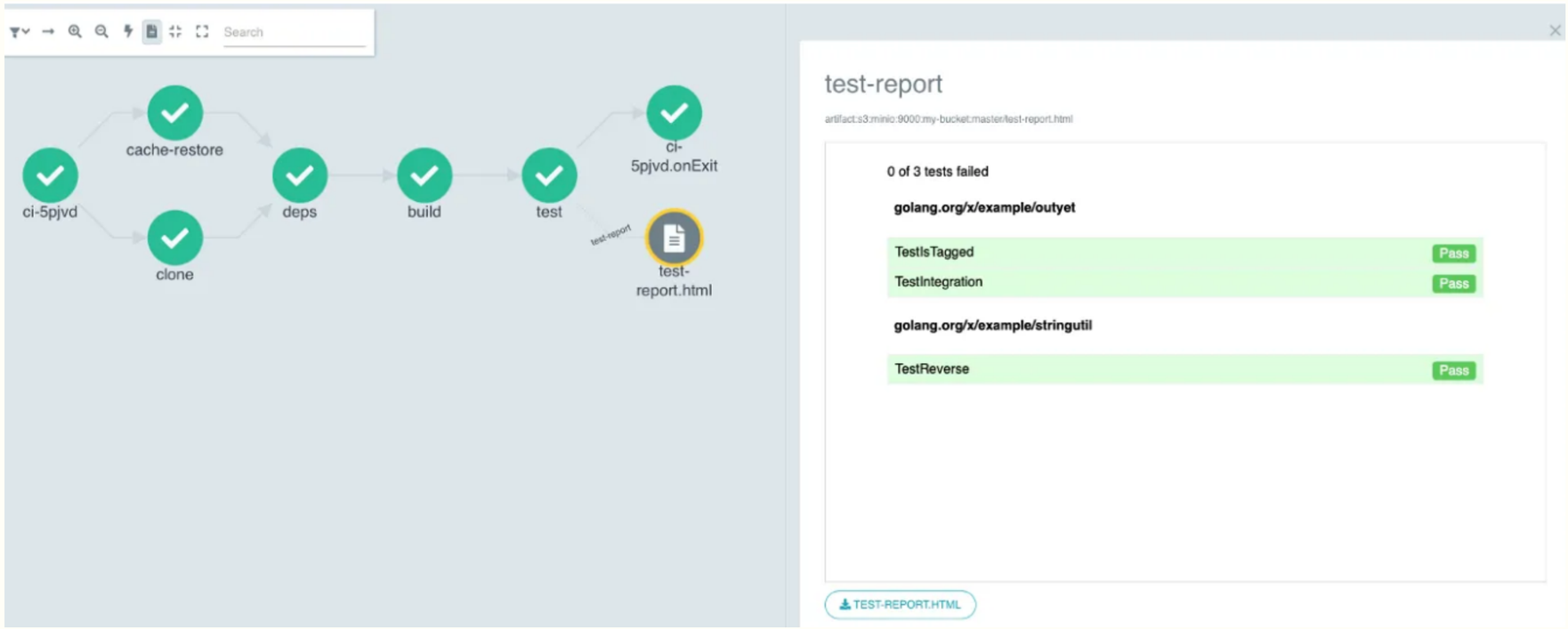
```
ci-p7bcm-helm-build-127278775: See https://github.com/instrumenta/helm-conftest for help
getting started.
ci-p7bcm-helm-build-127278775: Installed plugin: conftest
ci-p7bcm-helm-build-127278775: +---------+------+--------------------------------+
ci-p7bcm-helm-build-127278775: | RESULT  | FILE |            MESSAGE             |
ci-p7bcm-helm-build-127278775: +---------+------+--------------------------------+
ci-p7bcm-helm-build-127278775: | success | -    | data.main.warn                 |
ci-p7bcm-helm-build-127278775: | success | -    | data.main.warn                 |
ci-p7bcm-helm-build-127278775: | success | -    | data.main.deny                 |
ci-p7bcm-helm-build-127278775: | success | -    | data.main.deny                 |
ci-p7bcm-helm-build-127278775: | success | -    |                                |
```

04

```
ci-p7bcm-tagging-and-locking-3927130954: + git push
https://jenkins:iDirect@vault.idirect.net/scm/~mchisa/alarmmgrtest.git --tags
ci-p7bcm-tagging-and-locking-3927130954: To https://vault.idirect.net/scm/~mchisa/alarmmgrtest.git
ci-p7bcm-tagging-and-locking-3927130954:  * [new tag]         0.13.0 -> 0.13.0
ci-p7bcm-tagging-and-locking-3927130954: time="2023-11-07T10:05:17.348Z" level=info msg="sub-process
exited" argo=true error="<nil>"
```

#gui

In action...

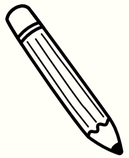


References

code: https://github.com/djmario-ro/argo-ci/tree/main

ArgoCD: https://argo-cd.readthedocs.io/en/stable/

SemVer: https://semver.org/



kaniko: https://github.com/GoogleContainerTools/kaniko

argo events/workflows: https://argoproj.github.io/

Crossplane: https://www.crossplane.io/

helm conftest: https://github.com/instrumenta/helm-conftest

Clair: https://github.com/quay/clair

Port: https://www.getport.io/

Thank you!

Listing software