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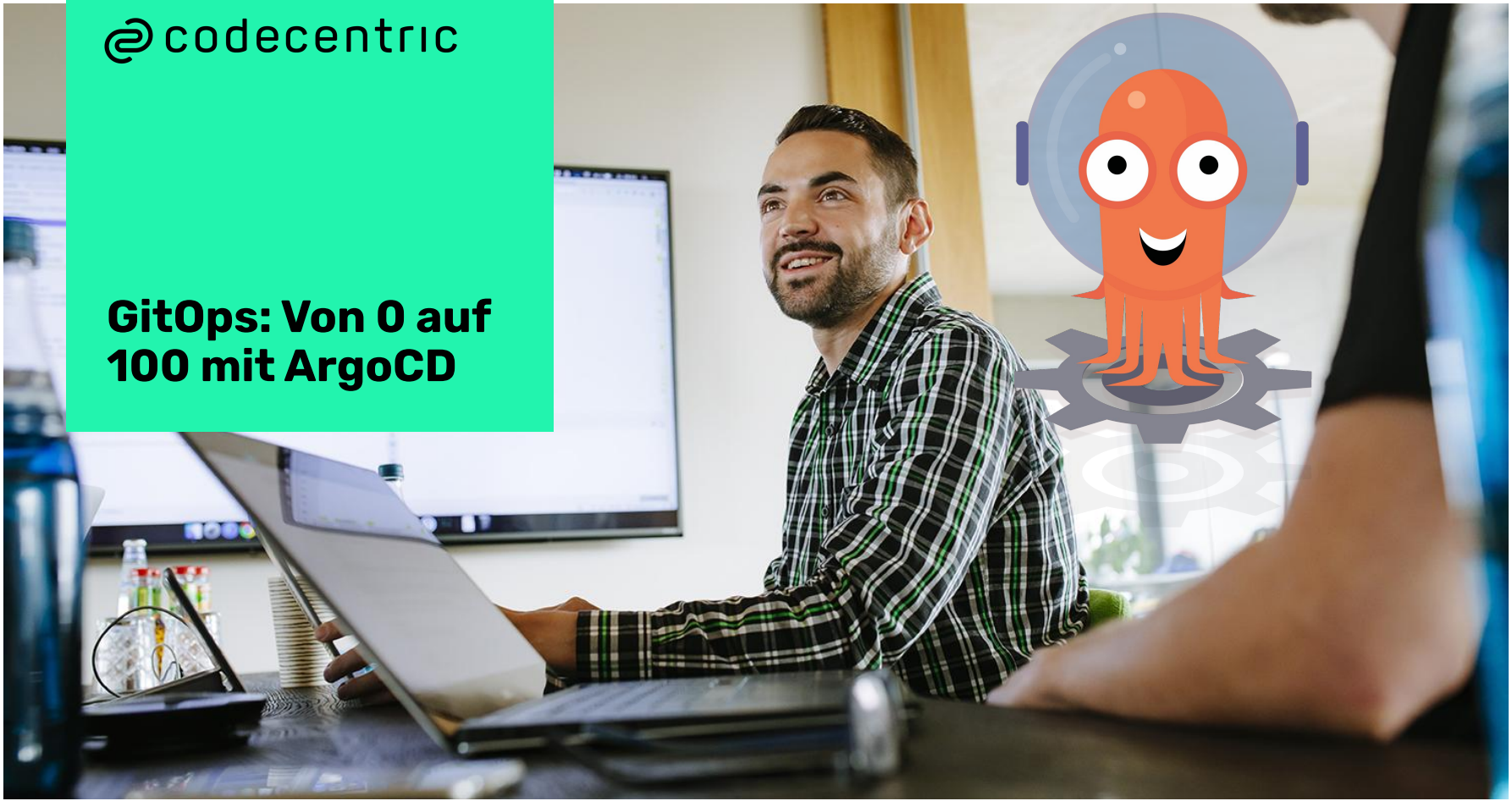
GitOps: Von 0 auf 100 mit ArgoCD



Vorstellung

Tobias Derksen

- DevOps Consultant
- CI/CD Experte
- OpenShift Architekt

Überblick

Installation

AppProject

Application

ApplicationSet

Demo

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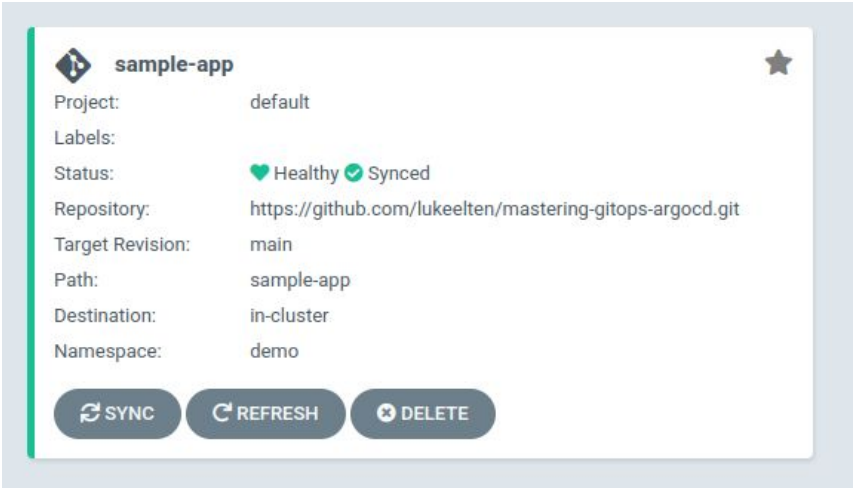
Überblick

Motivation

- Continuous Delivery für kubernetes
- Git als Single Source of Truth
- Automatisches Deployment in kubernetes
- Zustand der Applikation im Cluster enforcen

Konzepte

- Pull Prinzip
- AppProject
- Application
- ApplicationSet
- ArgoCD State im kubernetes



Features

- User Interface
- CLI Tool
- Multi Cluster
- Multi Tenant
- RBAC
- High Availability

Deployment Tools

- Plain YAML
- kustomize
- Helm
- Ksonnet
- Jsonnet
- Custom Tools

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Installation

Installationsmethoden

- Static YAML File
- Helm Chart
- Operator

Komponenten

- API Server
- Repository Server
- Application Controller
- Redis als cache und message broker
- Dex IdP (optional)

Konfiguration

- ArgoCD selbst ist stateless
- Konfiguration in ConfigMaps & Secrets
- Kein Neustart notwendig

```yaml
kind: ConfigMap
apiVersion: v1
metadata:
  name: argocd-cm
  namespace: argocd
data:
  application.instanceLabelKey: ''
  kustomize.buildOptions: ''
  url: 'https://argocd.cc-openshift.de'
  users.anonymous.enabled: 'false'
```

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AppProject

Konzept

- CRD: AppProject
- Logische Gruppierung
- Rechte Management für Applications

GENERAL

NAME	demo
DESCRIPTION	Demo Project
LABELS	

SOURCE REPOSITORIES

https://github.com/lukeelten/mastering-gitops-argocd.git

ADD SOURCE

DESTINATIONS

Server	Name	Namespace
https://kubernetes.default.svc	in-cluster	*

CLUSTER RESOURCE ALLOW LIST

Kind	Group
Namespace	*

CLUSTER RESOURCE DENY LIST

The cluster resource deny list is empty

NAMESPACE RESOURCE ALLOW LIST

The namespace resource allow list is empty

NAMESPACE RESOURCE DENY LIST

Kind	Group
RoleBinding	*
Role	*

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Application

Parameter

- Project
- Repository
- Cluster
- Namespace

```yaml
apiVersion: argoproj.io/v1alpha1
kind: Application
metadata:
  name: sample-app
  namespace: argocd
spec:
  destination:
    namespace: demo
    server: 'https://kubernetes.default.svc'
  project: default
  revisionHistoryLimit: 2
  source:
    path: sample-app
    repoURL: 'https://github.com/lukeelten/mastering-gitops-argocd.git'
    targetRevision: main
  syncPolicy:
    automated: {}
    syncOptions:
      - CreateNamespace=true
```

GENERAL

Application Name

ArgoCD

Project

default

SOURCE

Repository URL

https://github.com/lukeelten/mastering-gitops-argocd.git

Revision

HEAD

Path

argocd

DESTINATION

Cluster URL

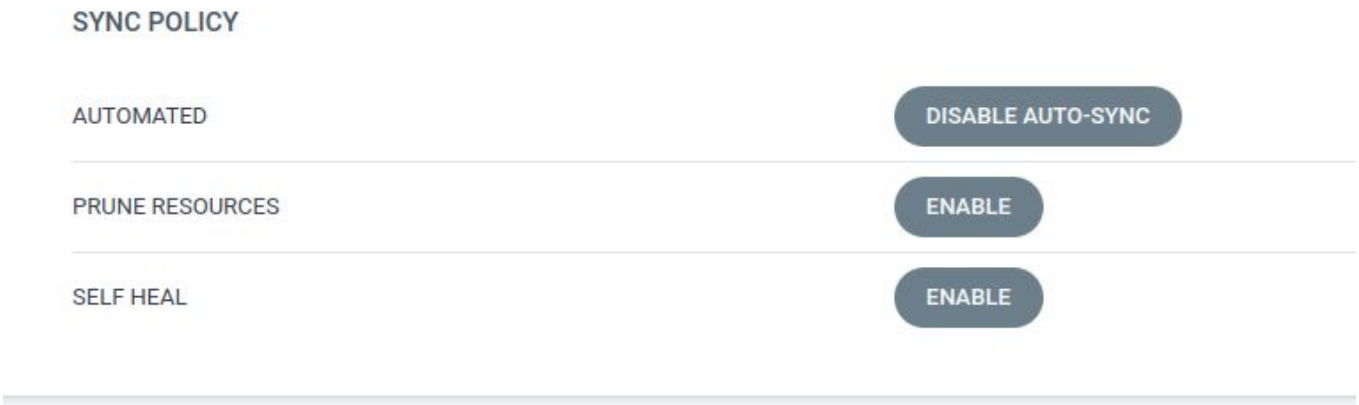
https://kubernetes.default.svc

Namespace

argocd

Sync Policy

- AutoSync
- Prune Resources
- Self Heal



Erweiterte Konzepte

- Sync Windows
- Sync Phases
- Sync Waves
- Diffing Customizations

App of Apps

- Bootstrap Applications aus Git
- Applications sind Custom Resources
- Verwalte Applications in Application

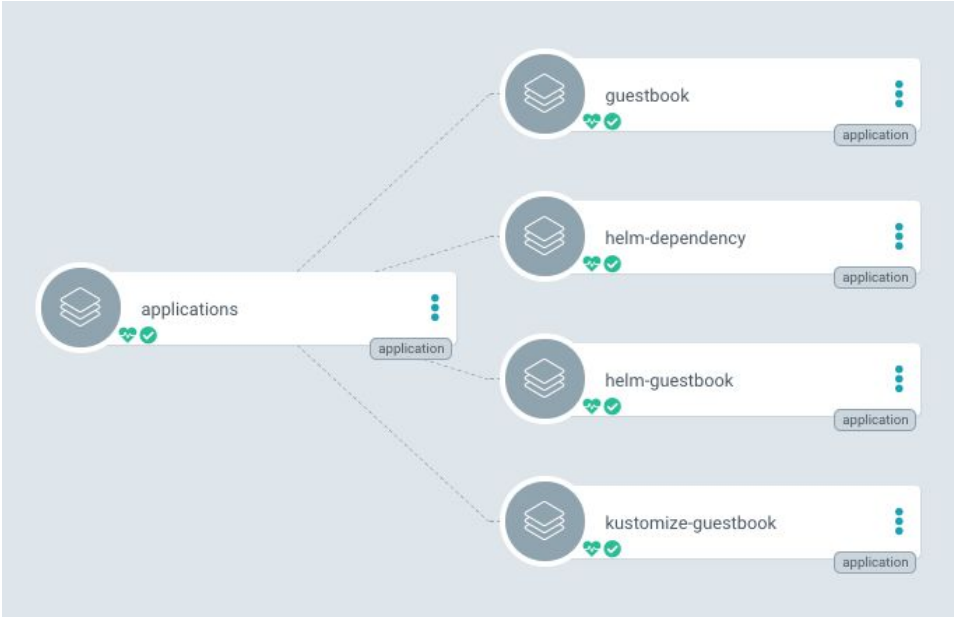


Image Source: ArgoCD Documentation

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ApplicationSet

Konzept

- Eigener Controller
- Generator für Applications
- Deploy eine Application in mehrere Cluster
- Generiere mehrere Apps aus einem Git

```
# (...)
 template:
   metadata:
     name: '{{cluster}}-guestbook'
   spec:
     source:
       repoURL: https://github.com/infra-team/cluster-deployments.git
       targetRevision: HEAD
       path: guestbook/{{cluster}}
     destination:
       server: '{{url}}'
       namespace: guestbook
```

Generatoren

- List generator
- Cluster generator
- Git generator
- SCM Provider (e.g. GitHub)
- Pull Request generator
- Merge Generator

Use Cases

- Multi Cluster Deployment
- Mono Repo
- Self Service Deployment
- Automatic Deployment of Pull Requests

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Demo

Ende

- https://blog.argoproj.io/
- https://argo-cd.readthedocs.io/en/stable/SUPPORT/
- https://github.com/lukeelten/mastering-gitops-argocd
- https://developers.redhat.com/courses/gitops/getting-started-argocd-and-openshift-gitops-operator

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