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IT-Tage 2018

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Continuous Delivery-Pipelines mit Concourse CI

https://github.com/andifalk/concourse-ci-demo

#ittage

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NOVATEC

WHAT IS CONCOURSE CI ?

“CONCOURSE IS AN OPEN-SOURCE CONTINUOUS THING-DOER”

“Built on the simple mechanics of resources, tasks, and jobs, Concourse presents a general approach to automation that makes it great for CI/CD”

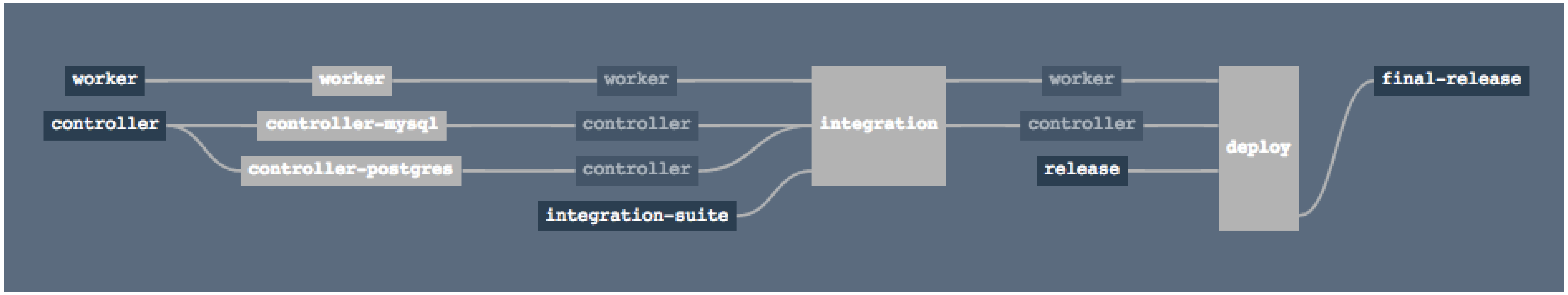
https://concourse-ci.org

CONCOURSE CI FEATURES

Native Visualized Pipelines

Clean Isolation By Using Containers

Administration Via Command Line



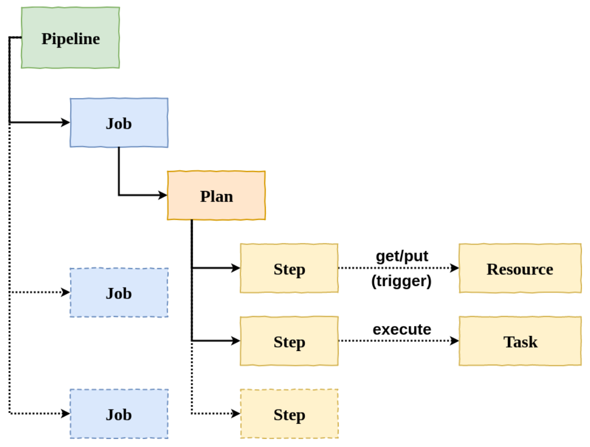
(picture taken from Concourse Tutorial by Stark & Wayne)

CONCOURSE CI CONCEPTS

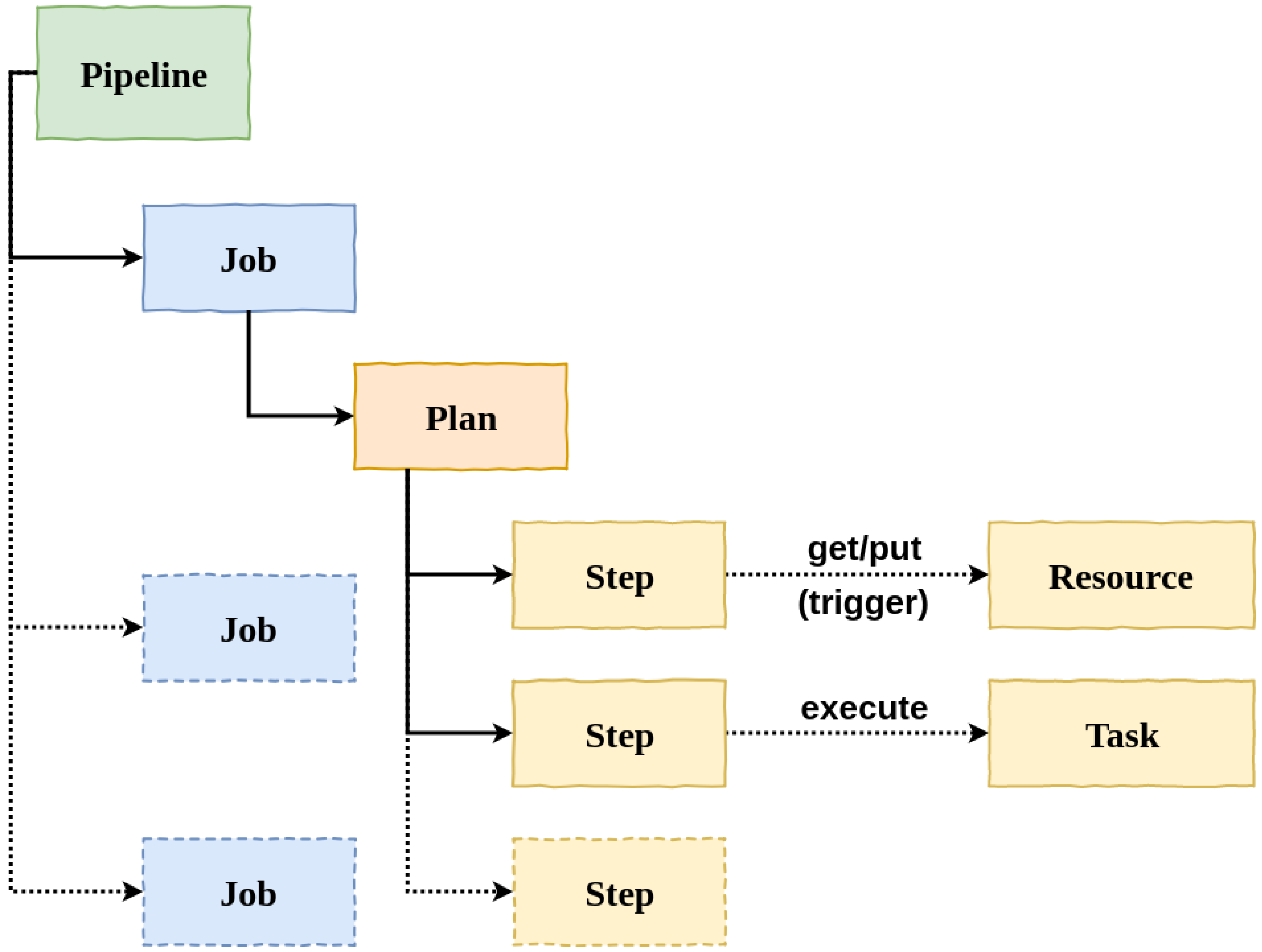
Configuration As Code

No Plugins

Simple Building Blocks for Pipelines

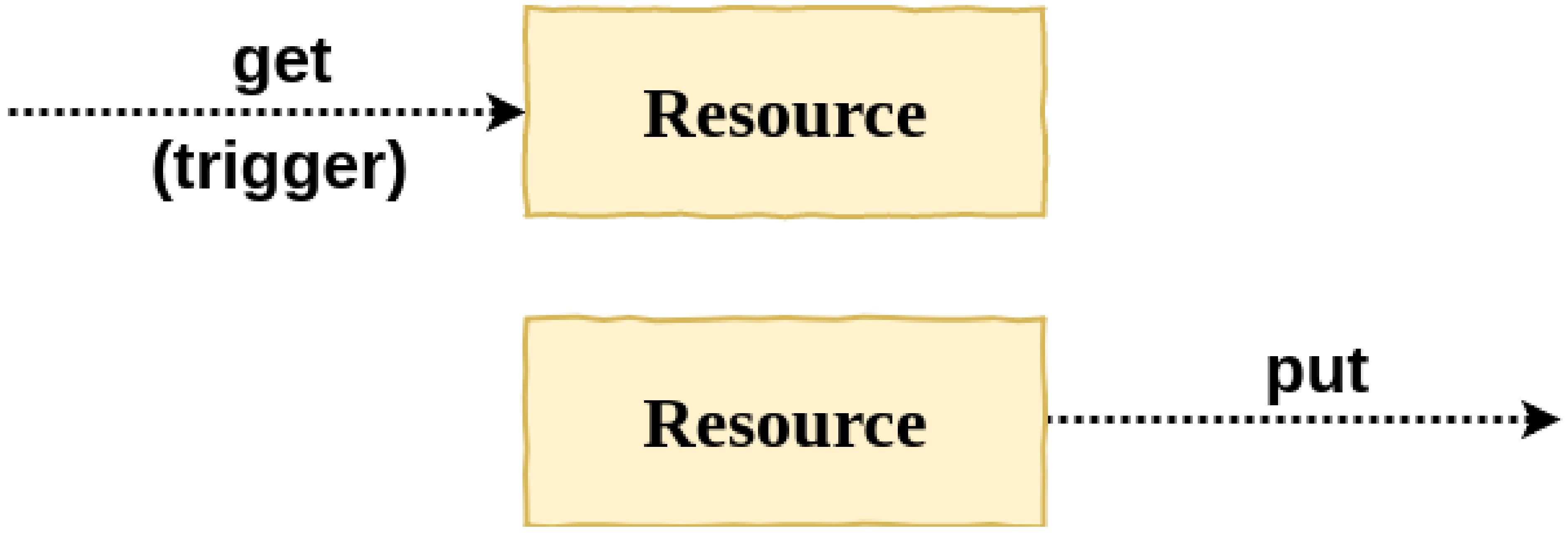


PIPELINE


Pipeline
Job
Plan
Step
get/put
(trigger)
Resource
Job
Step
execute
Task
Job
Step

RESOURCE

Connect Concourse CI to the outside world



RESOURCE TYPES

PROVIDED

Git: Pull/push from/to git repository

S3: Get and upload from/to AWS S3

CF: Deploy an application to Cloud Foundry

RESOURCE TYPES

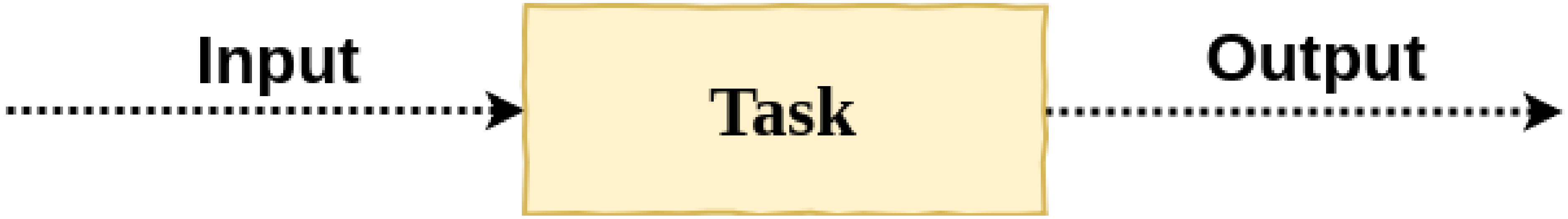
COMMUNITY

Artifactory: Get/upload artifacts from/to Artifactory

Kubernetes: Apply kubectl actions

TASK

Pure Function



HELLO WORLD TASK

task-helloworld.yml

```yaml
---
platform: linux

image_resource:
    type: docker-image
    source: {repository: alpine}

run:
    path: echo
    args: ["Hello, world!"]
```

HELLO WORLD PIPELINE

pipeline-helloworld.yml

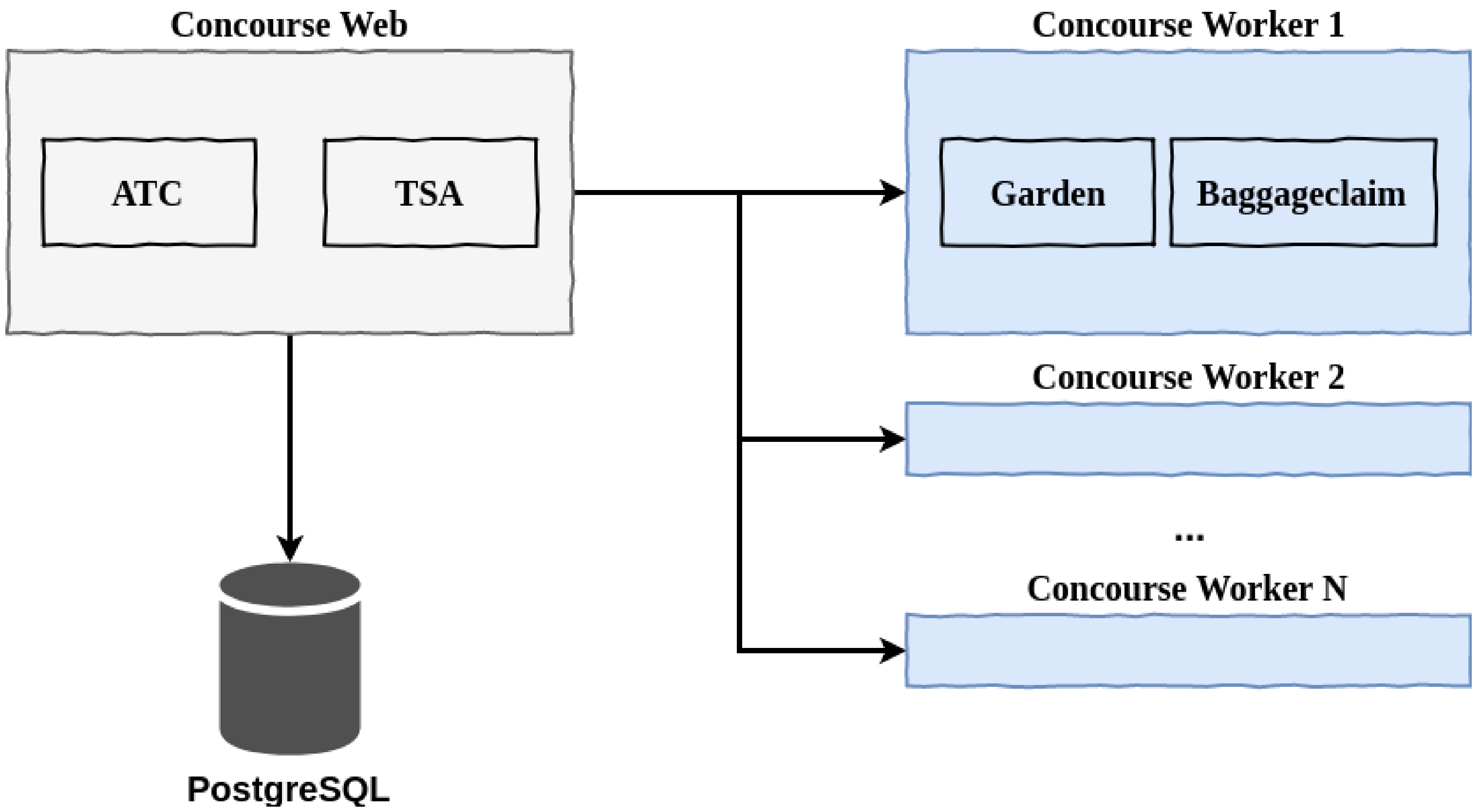
```
jobs:
- name: hello-world
  plan:
  - task: say-hello
    file: task-helloworld.yml
```

HELLO WORLD PIPELINE (INLINE)

pipeline-helloworld-inlined.yml

```
jobs:
- name: hello-world
  plan:
  - task: say-hello
    config:
      platform: linux
      image_resource:
        type: docker-image
        source: {repository: alpine}
      run:
        path: echo
        args: ["Hello, world!"]
```

CONCOURSE ARCHITECTURE



SETTING UP CONCOURSE CI

POSSIBLE OPTIONS

1. Run with docker-compose
2. Use Concourse quickstart
3. Set up a multi-node cluster
4. Concourse Up (EngineerBetter)
5. Concourse Helm Chart (k8s)
6. BUCC (StarkAndWayne)

RUN WITH DOCKER-COMPOSE

```
$ wget https://concourse-ci.org/docker-compose.yml
$ docker-compose up
```

USE CONCOURSE QUICKSTART

Required: Installed PostgreSQL database

```
$ concourse quickstart \
  --add-local-user dev:dev \
  --main-team-local-user dev \
  --postgres-user concourse --postgres-password concourse \
  --worker-work-dir /home/afa/concourse/worker \
  --external-url http://192.168.178.27:8080 \
  --worker-garden-dns-server 1.1.1.1
```

INSTALL INTO KUBERNETES CLUSTER

Prerequisite: Install Helm

```
$ helm install stable/concourse
```

After installing, perform this in same shell:

```
$ helm install stable/concourse
$ export POD_NAME=$(kubectl get pods --namespace default \
  -l "app=alternating-angelfish-web" \
  -o jsonpath="{.items[0].metadata.name}")
$ echo "Visit http://127.0.0.1:8080 to use Concourse"
$ kubectl port-forward --namespace \
  default $POD_NAME 8080:8080
```

CONCOURSE

COMMAND LINE 1 X 1

Concourse Fly CLI

GETTING STARTED

Login to Concourse

```
$ fly login -t local -c http://127.0.0.1:8080 \
  -u user -p password
```

Logout from one Concourse target

```
$ fly logout -t local
```

Logout from all Concourse targets

```
$ fly logout --all
```

EXECUTE TASKS

Execute a single task

```
$ fly execute -t local -c mytask.yml
```

Show results of a build execution

```
$ fly -t local builds
```

USING PIPELINES

Create or update a pipeline

```
$ fly set-pipeline -t local -p mypipeline \
    -c mypipeline-config.yml
```

Un-pause a pipeline

```
$ fly unpause-pipeline -t local -p mypipeline
```

Delete a pipeline

```
$ fly destroy-pipeline -t local -p mypipeline
```

START & WATCH JOBS

Start a job in a pipeline

```
$ fly trigger-job -t local -j mypipeline/myjob
```

Start a job in a pipeline and watch output

```
$ fly trigger-job -t local -j mypipeline/myjob --watch
```

Stream a build's output

```
$ fly watch -t local -j mypipeline/myjob
```

CONCOURSE SECURITY

AUTHENTICATION PROVIDERS

Local users

3rd party providers (GitHub, CF UAA)

AUTHORIZATION BY TEAMS

“main” team (Administration)

Further teams created/updated by “main” team

CREDENTIALS IN CONCOURSE CI

CredHub

Hashicorp Vault

HASHICORP VAULT

“A Security Swiss Army Knife”

Jeff Mitchell, Vault Lead, HashiCorp

https://www.vaultproject.io

CREDHUB

CredHub manages credentials like passwords, certificates, certificate authorities, ssh keys, rsa keys and arbitrary values

https://github.com/cloudfoundry-incubator/credhub

CONCOURSE QUICKSTART WITH VAULT

Required: Installed Vault instance

```
$ concourse quickstart \
    --add-local-user dev:dev \
    --main-team-local-user dev \
    --postgres-user concourse --postgres-password concourse \
    --worker-work-dir /home/afa/concourse/worker \
    --external-url http://192.168.178.27:8080 \
    --worker-garden-dns-server 1.1.1.1 \
    --vault-url http://10.2.0.3:8200 \
    --vault-auth-backend approle \
    --vault-auth-param role_id=db02de05-fa39-4855-059b-... \
    --vault-auth-param secret_id=6a174c20-f6de-a53c-74d2-...
```

CREDENTIAL LOOKUP IN VAULT

The parameter *((my_password))* is looked up in Vault namespaces in this order:

1. /concourse/{TEAM}/{PIPELINE}/my_password
2. /concourse/{TEAM}/my_password

```
plan:
- get: my-repo
- task: integration
  file: my-repo/ci/integration.yml
  params:
    REMOTE_SERVER: 10.20.30.40:8080
    USERNAME: ((my-username))
    PASSWORD: ((my-password))
```

Q&A

https://www.novatec-gmbh.de
https://blog.novatec-gmbh.de

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@andifalk

IT-Tage 2018 (Frankfurt)
12.12.2018
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REFERENCES

- Concourse CI (https://concourse-ci.org)
- Concourse Fly CLI (https://github.com/concourse/fly/releases)
- CredHub (https://github.com/cloudfoundry-incubator/credhub)
- Vault (https://www.vaultproject.io)
- Sources and Presentation (https://github.com/andifalk/concourse-ci-demo)