



EXECUTION ENVIRONMENTS

Container Images als Ansible Control Nodes



WHOAMI

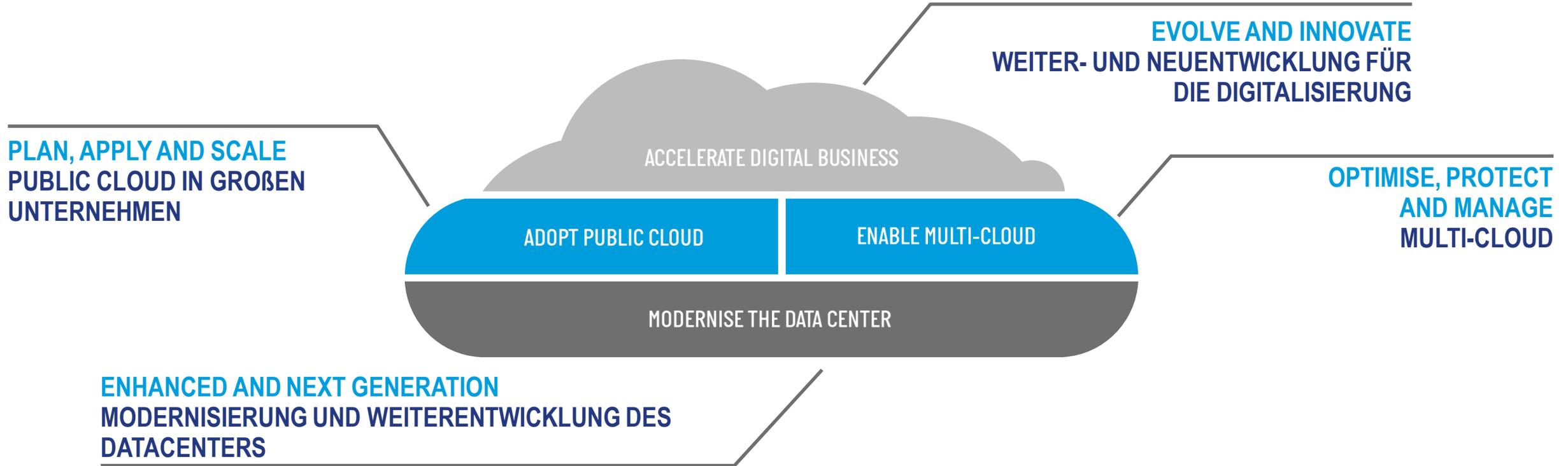


Tim Grützmacher

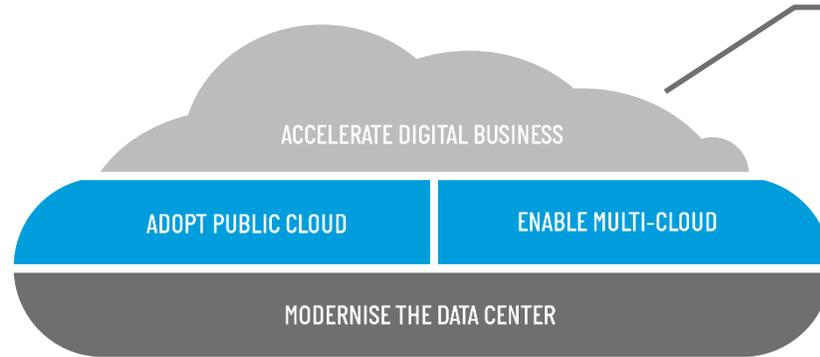
Consultant
Computacenter



Computacenter Portefolio



WAS WIR TUN



EVOLVE AND INNOVATE
WEITER- UND NEUENTWICKLUNG FÜR DIE
DIGITALISIERUNG

UNSERE THEMEN

- DevOps Enablement
- Analytics Infrastructure & Platforms
- Container Platform
- IoT Platform
- Process & Workflow Automation
- Application Co-creation

EVOLVE

Wir helfen bei der Transformation bestehender Geschäftsprozesse und Workflows zu digitalen, cloudbasierten Services.

INNOVATE

Wir unterstützen beim Bau neuer von Anwendungs- und Datenplattformen und entwickeln in Zusammenarbeit mit unseren Kunden neue digitale Services.

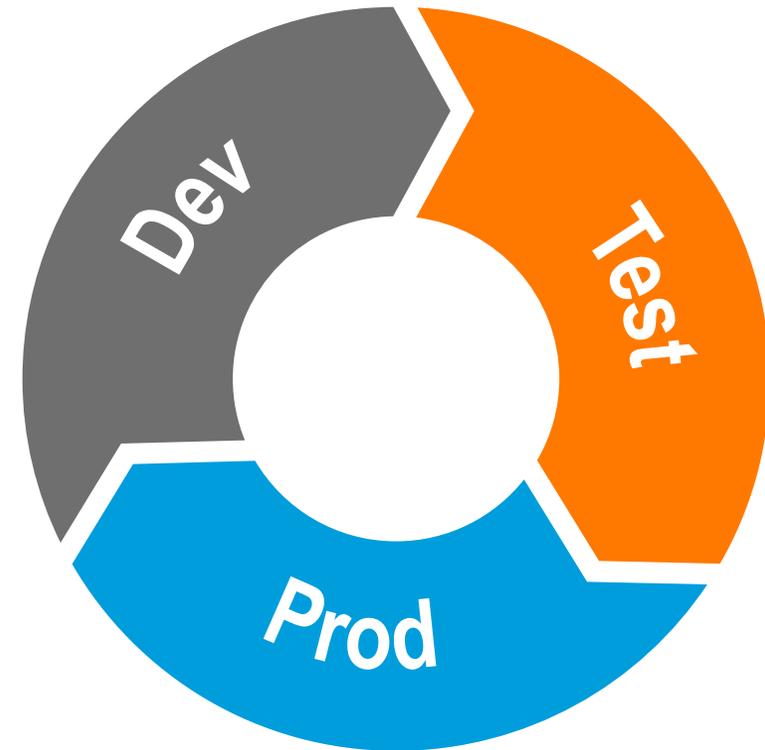
Wir helfen bei der Einführung moderner Entwicklungsmethoden, beim Aufbau von Daten- und Anwendungsplattformen und durch die gemeinsame Entwicklung neuer, digitaler Services.

HEUTE

- Entwickler erstellt Ansible Content lokal
- Ansible Content muss in Test und Staging-Umgebung getestet werden
- Content wird in Produktion ausgebracht
- neue Funktionalität im Playbook, Zyklus muss erneut durchlaufen werden

Herausforderung:

- Konsistenz
- Nachvollziehbarkeit
- Portabilität



ABHÄNGIGKEITEN

Ansible wird modularer

- ansible-base
- Content Collections

Ansible Content hat Voraussetzungen

- versch. Python-Pakete

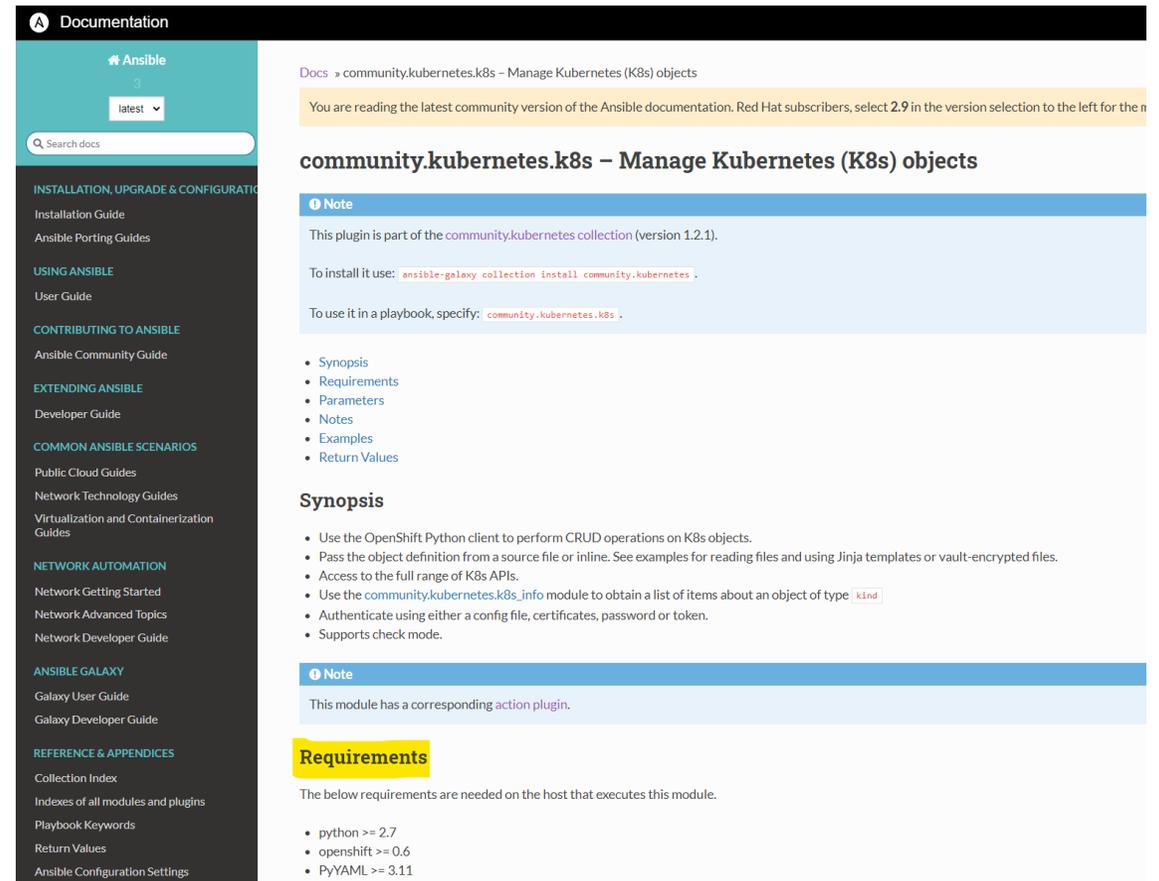
Eigenentwicklung haben OS-Abhängigkeiten

- Libs und Binaries

Testing in konsistenten Umgebungen

- schwer in Sync zu halten

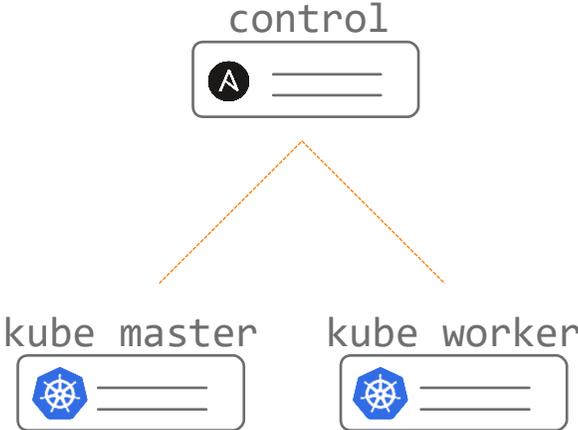
Abhängigkeiten führen zu Abhängigkeiten, führen zu...



The screenshot shows the Ansible documentation page for the `community.kubernetes.k8s` collection. The page title is "community.kubernetes.k8s – Manage Kubernetes (K8s) objects". A note indicates that the user is reading the latest community version (1.2.1) and suggests Red Hat subscribers select 2.9. The page includes a "Note" section stating that the plugin is part of the `community.kubernetes` collection. It provides installation instructions using `ansible-galaxy collection install community.kubernetes` and a playbook snippet: `community.kubernetes.k8s`. A "Synopsis" section lists the use cases: performing CRUD operations on K8s objects, reading files and using Jinja templates, accessing K8s APIs, and authenticating. A "Requirements" section lists the dependencies: `python >= 2.7`, `openshift >= 0.6`, and `PyYAML >= 3.11`. The left sidebar contains a navigation menu with categories like "INSTALLATION, UPGRADE & CONFIGURATION", "USING ANSIBLE", "CONTRIBUTING TO ANSIBLE", "EXTENDING ANSIBLE", "COMMON ANSIBLE SCENARIOS", "NETWORK AUTOMATION", "ANSIBLE GALAXY", and "REFERENCE & APPENDICES".



LIVE DEMO



How to actually learn any new programming concept

Essential

Changing Stuff and Seeing What Happens

○ RLY? @ThePracticalDev

Solutions that might fix the problem without breaking anything

Essential

Hoping This Works

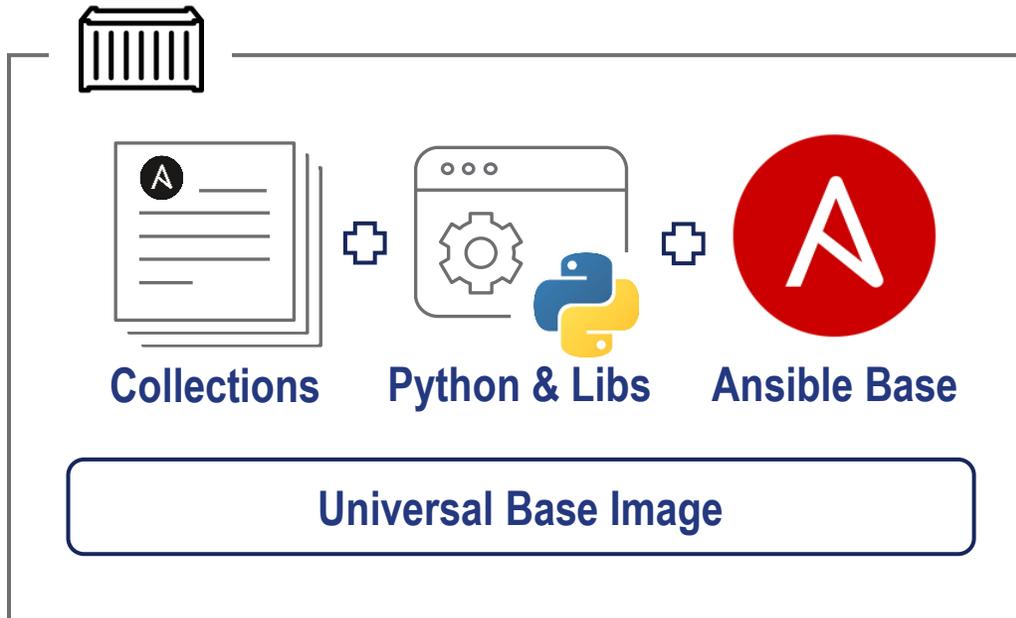
○ RLY? @ThePracticalDev



EXECUTION ENVIRONMENT

Container als Ansible Control Node

- ansible-base (ansible-core)
- alle notwendigen Collections
- notwendige RPM und/oder Python Pakete



The screenshot shows the Ansible Tower web interface. The top navigation bar includes the 'TOWER' logo and the user 'tgruetzmache'. The left sidebar contains navigation options: VIEWS (Dashboard, Jobs, Schedules, My View), RESOURCES (Templates, Credentials, Projects, Inventories, Inventory Scripts), ACCESS (Organizations, Users, Teams), and ADMINISTRATION. The main content area displays job details for 'Cisco ACI - add new tenant'. The job is 'Successful' and was started on 3/26/2021 at 8:58:08 AM. The job template is 'Cisco ACI - add new tenant', the job type is 'Run', and it was launched by 'twaechter'. The inventory is 'CLOUD APIC', the project is 'ACI Automation with Ansible Tower - develop', the revision is '38b8971', and the playbook is 'tower_playbook_add_tenant.yml'. The credential is 'CLOUD APIC Tower Login'. The environment is '/var/lib/awx/venv/ansible'. The execution node is 'localhost' and the instance group is 'tower'. The extra variables are 'YAML' and 'JSON'. The right panel shows the execution output for the job, including a search bar and a list of tasks. The tasks are: 1. PLAY [Add aci tenant], 2. TASK [Set login credentials], and 3. TASK [Create new aci Tenants]. The output for the third task shows 'changed: [apic1.ccloud.ninja -> localhost]'.



ANSIBLE BUILDER

Erstellung von Execution Environments

- leicht portierbar
- unabhängige, in sich geschlossene Umgebung mit allen notwendigen Abhängigkeiten
- kompatibel mit Docker und Podman

- `ansible-builder build`
 - `--tag`
 - `--file`
 - `--context`
 - `--build-arg`
 - `--container-runtime`
 - `--verbosity`

execution-environment.yml

```
---
version: 1

build_arg_defaults:
  ANSIBLE_RUNNER_IMAGE: 'quay.io/ansible/ansible-runner:stable-2.10-devel'

dependencies:
  galaxy: requirements.yml
  python: requirements.txt

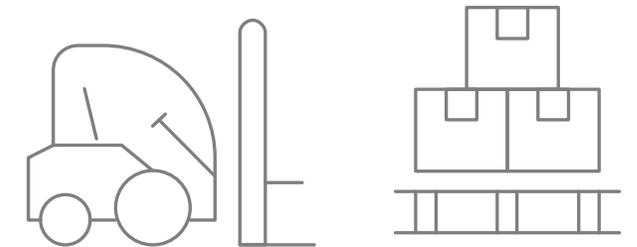
ansible_config: 'ansible.cfg'
```

requirements.txt

```
netaddr
openshift
jmespath
```

requirements.yml

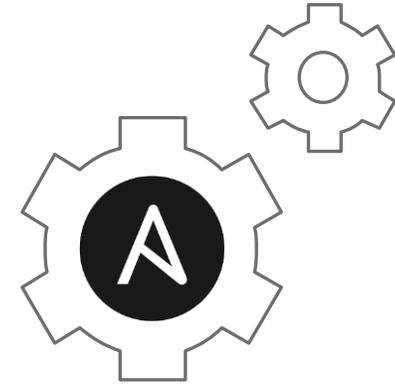
```
---
collections:
  - ansible.posix
  - community.kubernetes
  - amazon.aws
```



ANSIBLE RUNNER

Ansible Runner als stabiles und konsistentes Abstraktionsinterface für Ansible

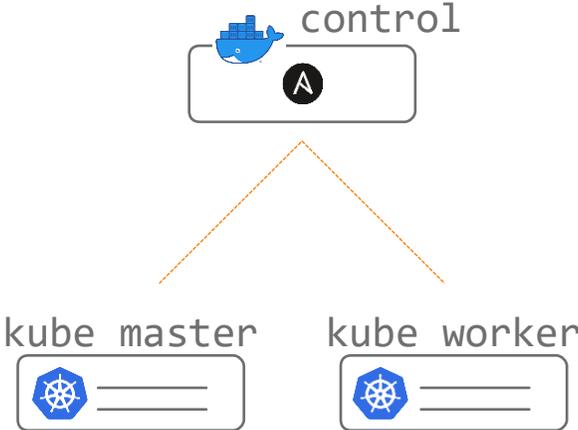
- Standalone, als Python Modul oder als Container Image Interface
- ab Version 2 (veröffentlicht 30. März 2021) Ausführung von Execution Environments
- nutzt standartmäßig Podman



```
$ pip3 install ansible-runner==2.0.0a2
$ podman images
REPOSITORY      TAG          IMAGE ID      CREATED      SIZE
my-exec-env    latest      a02336e9117a  40 hours ago  720MB
$ ansible-runner adhoc localhost -m ping
$ ansible-runner playbook --container-image my-exec-env --inventory hosts main.yml
```



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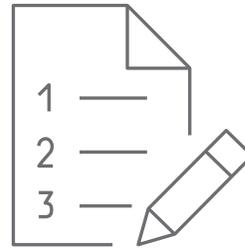


TOOLS

Version Control

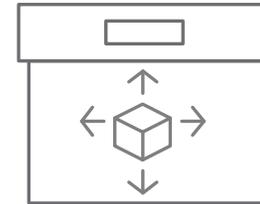


Inventory



Playbook

Container Registry



Execution Environment



EE PIPELINE



WRAP UP

Ansible und Container...

...eigentlich nichts Neues mehr.

Ansible im Container...

...für testen der Automatisierung auch bereits bekannt.

Ansible im Container als Controller...

...ist noch ganz neu, aber kann Lösung für viele Probleme sein.

Herausforderungen:

- Container Runtime in produktiven Umgebungen
- neue Tools für Ansible Nutzer und Entwickler

Execution Environments bald integraler Bestandteil der Ansible Automation Platform

ansible-runner 1.4.7 ✓ Latest version
Released: Feb 11, 2021

`pip install ansible-runner`

No project description provided

Navigation: [Project description](#), **Release history**, [Download files](#)

Project links: [Homepage](#)

Statistics: **Stars: 523**, **Forks: 188**, **Open issues/PRs: 70**

View statistics for this project via [Libraries.io](#), or by using [our public dataset on Google BigQuery](#)

Release history:

- 2.0.0a2** PRE-RELEASE (Apr 21, 2021) ←
- 2.0.0a1** PRE-RELEASE (Mar 30, 2021)
- 1.4.7** (Feb 11, 2021) **THIS VERSION**
- 1.4.6** (Mar 26, 2020)
- 1.4.5** (Mar 23, 2020)



VIELEN DANK!

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Demo Code

- <https://hub.docker.com/r/timgrt/ansible-anwendertreffen-demo-ee>
- <https://github.com/TimGrt/ansible-anwendertreffen-demo-execution-environment>
- <https://github.com/TimGrt/ansible-anwendertreffen-demo-playbooks>

Offizielle Dokumentation

- <https://ansible-runner.readthedocs.io/en/latest/>
- <https://ansible-builder.readthedocs.io/en/latest/>

