

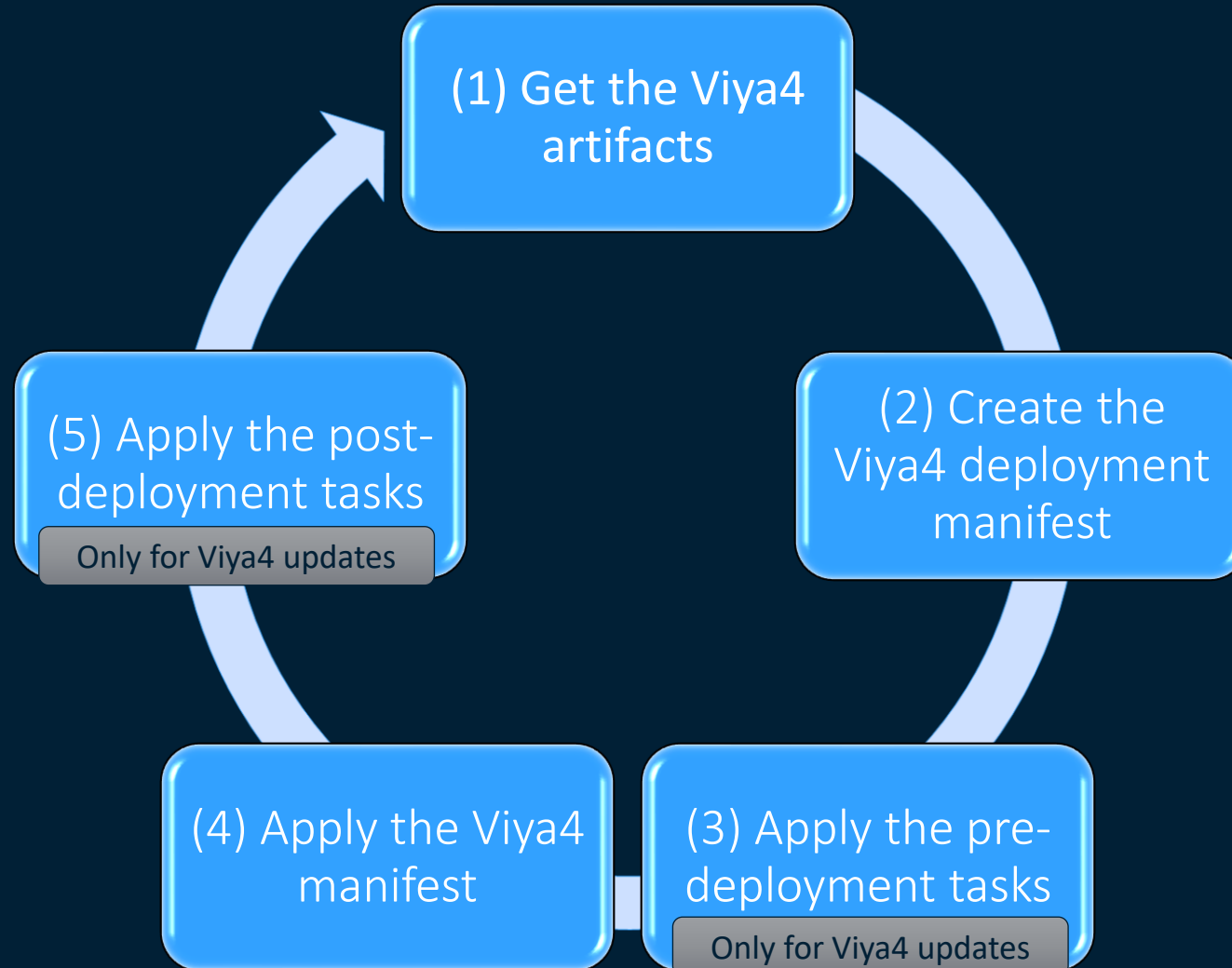


Viya4 Deployment Methods On Openshift

-
- **Introduction**
 - **Viya4 deployment process**
 - **Automation and Security**
 - **A real case scenario**

Quick introduction on the *SAS Viya4* deployment/update process

The SAS Viya 4 deployment/update process



(1) Get the Viya4 artifacts

My SAS - Order Overview

https://my.sas.com

Viya Orders > Order [REDACTED]

Order Details Downloads Download History

The last downloaded order asset for this order was Stable 2024.04 on 5/3/24, 10:05:23 AM by Me

Filter Versions Stable 2024.04 Asset Type Clear Filters

Stable - Version 2024.04 Details Download

How to Deploy Release Notes README

Asset Type	Date Available	Status
Deployment Assets	4/18/24	Update Available
License	4/18/24	
Certificates	4/18/24	

These are the "bricks" to build your Viya4 deployments



/viya4prod/deploy



sas-bases

- base
- checksums.txt
- components
- docs
- examples
- overlays
- README.md

Required to download the Viya4 container images and manifests

Name

- SASViyaV4_XXXXXX_certs.zip
- SASViyaV4_XXXXXX_stable_2024.04_20240502.1714682157933_deploymentAssets_2024-05-03T063840.tgz
- SASViyaV4_XXXXXX_stable_2024.04_license_2024-05-01T060209.jwt

<<unzip>>

(2) Create the Viya4 deployment manifest

```
/viya4prod/deploy
├── sas-bases
│   └── site-config
│       ├── ...
│       ├── data-access
│       ├── mirror.yaml
│       ├── postgres
│       ├── sas-launcher
│       ├── sas-microanalytic-score
│       ├── sas-open-source-config
│       ├── sas-programming-environment
│       ├── security
│       ├── ...
│       └── storageclass.yaml
├── kustomization.yaml
└── site.yaml
```



- The Viya4 deployment is build from the generic “bricks” downloaded in the previous step.
- **kustomize** is the tool used to create the Viya4 deployment manifest
- The SAS installer creates:
 - The **kustomization.yaml** file
 - All the resources inside **site-config** used to configure/customize the Viya4 components (the generic “bricks”)

<<generates>>

> kustomize build -o site.yaml

(3) Apply the pre-deployment tasks

SAS® Help Center

SAS® Viya® Platform Administration | 2024.04 ▾

Welcome

- What's New
- Accessibility Features
- SAS Viya Platform: Overview
- Backup and Restore
- Configuring your Environment
- Data
- **Deploy and Update**
 - Getting Started
 - System Requirements
 - Deployment
 - **Deployment Notes**
 - Introduction
 - Long-Term Support Releases
 - **Stable Releases**
 - 2024.05 (May 2024)
 - 2024.04 (April 2024)**
 - 2024.03 (March 2024)
 - 2024.02 (February 2024)
 - 2024.01 (January 2024)
 - 2023.12 (December 2023)
 - 2023.11 (November 2023)

- Only during the Viya4 update
- Task to be completed BEFORE applying the Viya4 deployment manifest (site.yaml)

(4) Apply the Viya4 manifest

- The site.yaml manifest contains all Viya4 resource definitions
- Huge file (~100K lines)
- Some resources require elevated privileges to be deployed
 - Selectors can be used to deploy specific resources based on the required privileges

```
> kubectl apply --selector="sas.com/admin=cluster-api" --server-side --force-conflicts -f site.yaml
```

```
> kubectl apply --selector="sas.com/admin=cluster-wide" -f site.yaml
```

```
> kubectl apply --selector="sas.com/admin=cluster-local" -f site.yaml --prune
```

```
> kubectl apply --selector="sas.com/admin=namespace" -f site.yaml --prune
```

Cluster administrator

Viya4 Project Owner

(5) Apply the Post-deployment tasks

The screenshot shows the SAS Help Center interface for SAS Viya Platform Administration, version 2024.04. The left sidebar contains a navigation menu with categories like 'Welcome', 'What's New', 'Accessibility Features', 'SAS Viya Platform: Overview', 'Backup and Restore', 'Configuring your Environment', 'Data', 'Deploy and Update', 'System Requirements', 'Deployment', 'Deployment Notes', and 'Stable Releases'. The 'Deployment Notes' section is expanded, showing a list of notes. The note titled 'After Deployment Commands' is highlighted with a yellow circle. Below this note, the text 'Update CAS Servers' is visible. A 'Note' section follows, providing instructions for updating software and state transfers. The bottom of the page shows the version '2024.04 (April 2024)'.

- Only during the Viya4 update
- Task to be completed AFTER the Viya4 deployment manifest (site.yaml) was applied.

Deployment in action

The deployment environment

OCP cluster



All pre-installation requirements have been deployed :

- Viya4 project
- SCC
- ...

Git server



Used to store all resources required to generate the Viya4 deployment manifest:

- kustomization.yaml, site-config, etc.

EXCEPT

- TLS private keys, credentials

Jump host (Mandatory)



Used to:

- generate the Viya4 deployment manifest
- Apply the manifests
- Perform operations on SAS Viya4

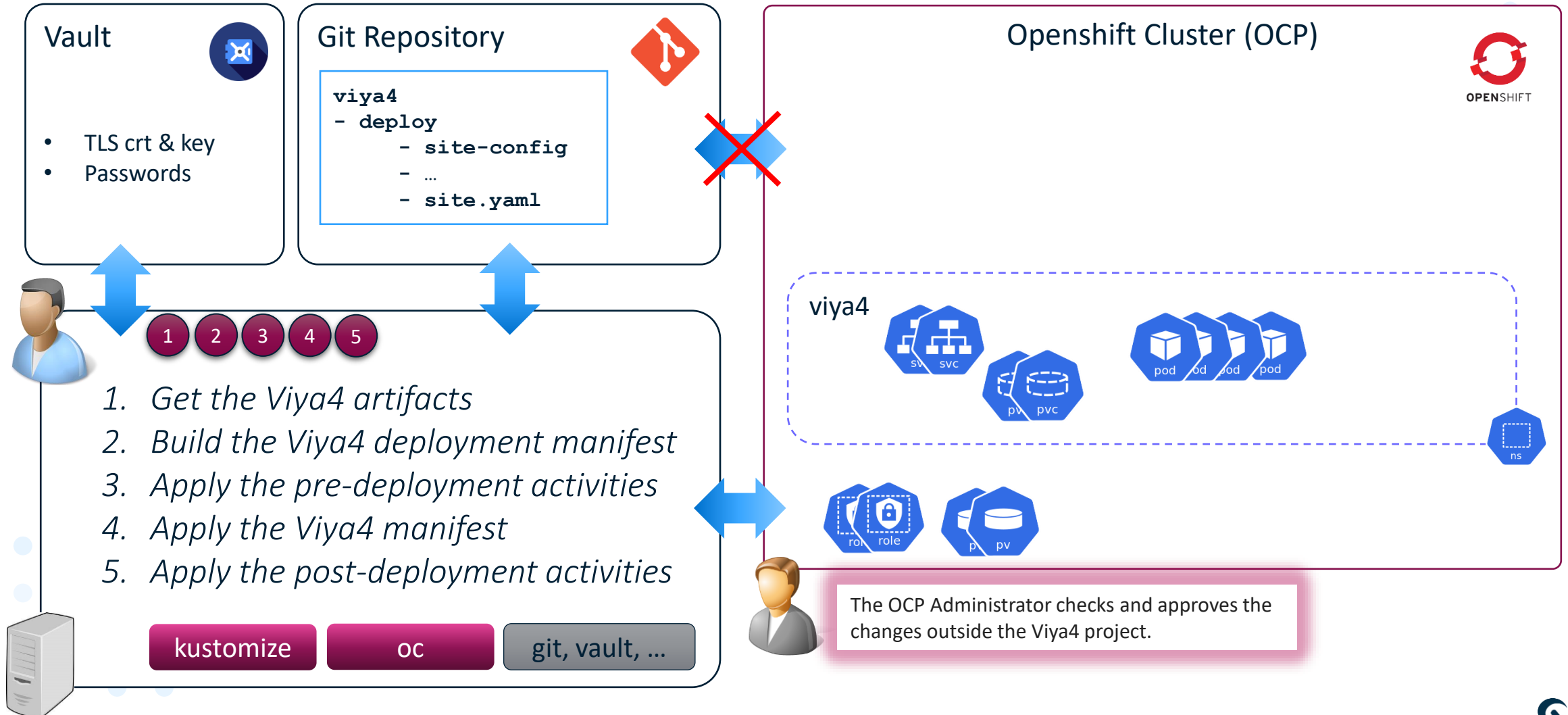
Secret Vault (Optional)



Used to store

- TLS crt & key
- Passwords

The Viya4 “Manual” deployment



**Can some activities be
automated ?**

Quick recap

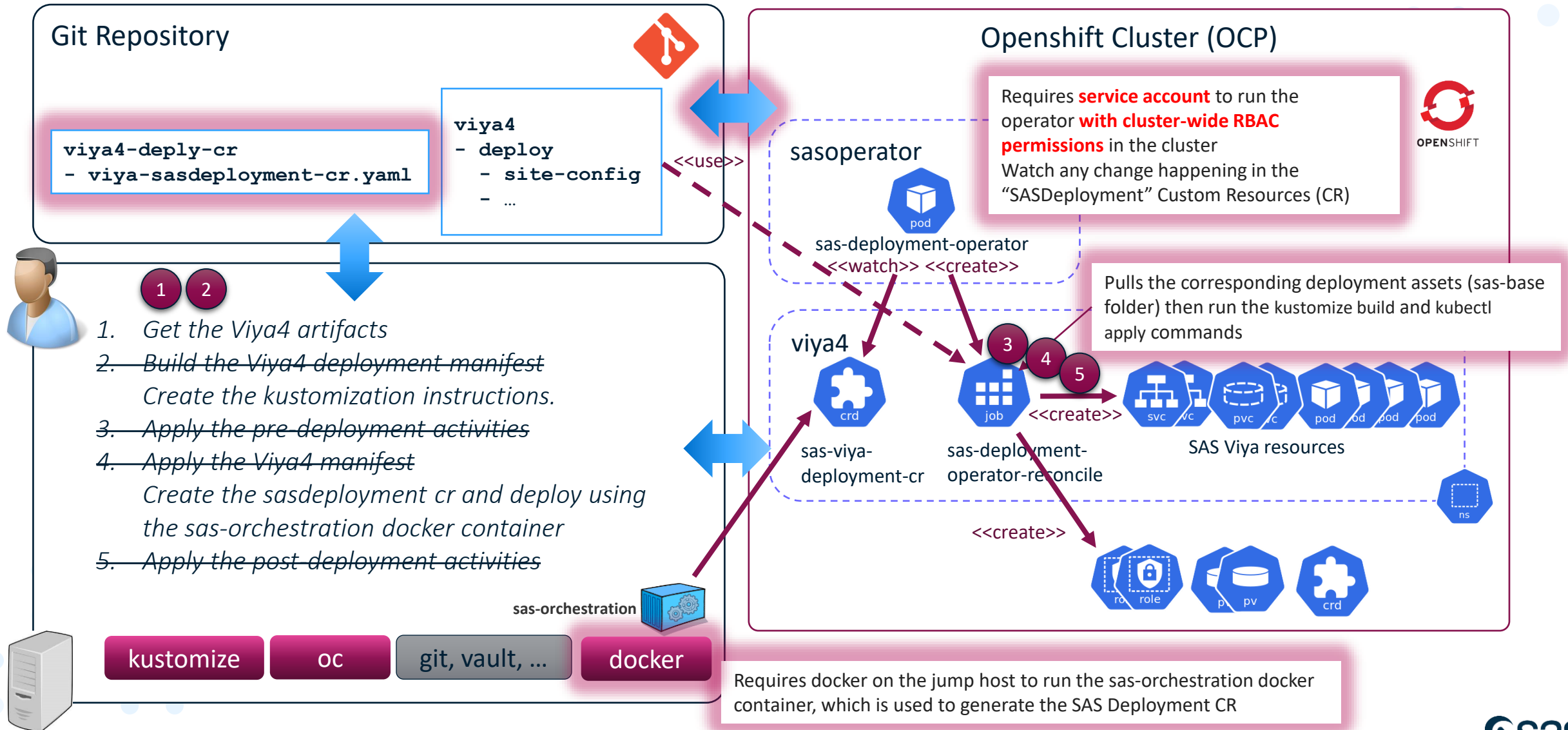
Step	Can be automated ?	OCP Interaction	Notes
(1) Get the Viya4 artifacts	Yes	No	<i>Artifacts can be downloaded using the SAS Viya Order API</i>
(2) Create the Viya4 deployment manifest	No	No	
(3) Apply the pre-deployment tasks ⁽¹⁾	Yes ⁽²⁾	Yes	Some activities could require elevated privileges
(4) Apply the Viya4 manifest	Yes	Yes	Some activities could require elevated privileges
(5) Apply the Post-deployment tasks ⁽¹⁾	Yes ⁽²⁾	Yes	Some activities could require elevated privileges

⁽¹⁾ Required only during the Viya updates

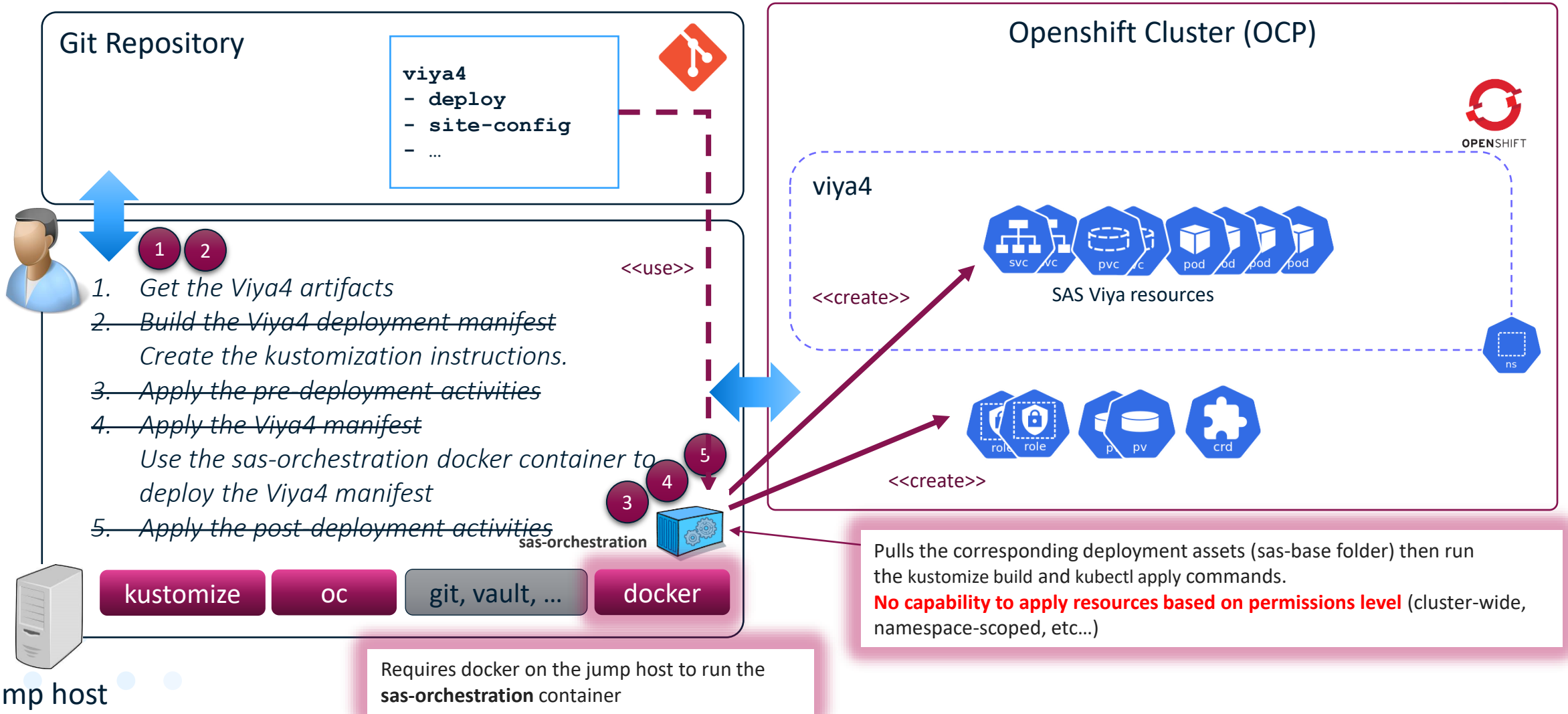
⁽²⁾ In special cases same activities can still require manual intervention

Out of the box Viya4 “automated” deployment methos

The Viya4 “Deployment Operator”



The Viya4 “sas-orchestration”



The Viya4 “Deployment as Code”



Not supported for Red Hat OpenShift

Viya4 “custom” deployment methos

The Viya4 “Custom” deployment

- It's possible to customize the deployment method
- Security and Automation are the main requirements in most of the customization processes
- The “manual” deployment is usually the starting point for the customization

GitOps ?

GitOps

*GitOps is a modern software development and deployment approach where **the entire infrastructure and application lifecycle is managed through Git repositories** as the single source of truth.*

*In this workflow, developers commit code changes and infrastructure configurations to Git repositories, **triggering automated CI/CD pipelines** that build, test, and deploy applications and infrastructure changes based on the Git repository state.*

[What is a GitOps workflow? \(redhat.com\)](https://www.redhat.com/en/topics/gitops/what-is-a-gitops-workflow)

OpenShift GitOps takes advantage of Argo CD and integrates it into Red Hat OpenShift to deliver a consistent, fully supported, declarative Kubernetes platform to configure and use with GitOps principles.

A real case scenario

A real case scenario

SAS Viya Administrator

- has with limited (“**read-only**”) permissions for the “Viy4” project.
- should provide only the manifests for the Viya4 project and for the OCP cluster.

OCP Administrators

- Validate and confirm any change at cluster level.
- Not interested in the Viya4 project deployment.

A real case scenario

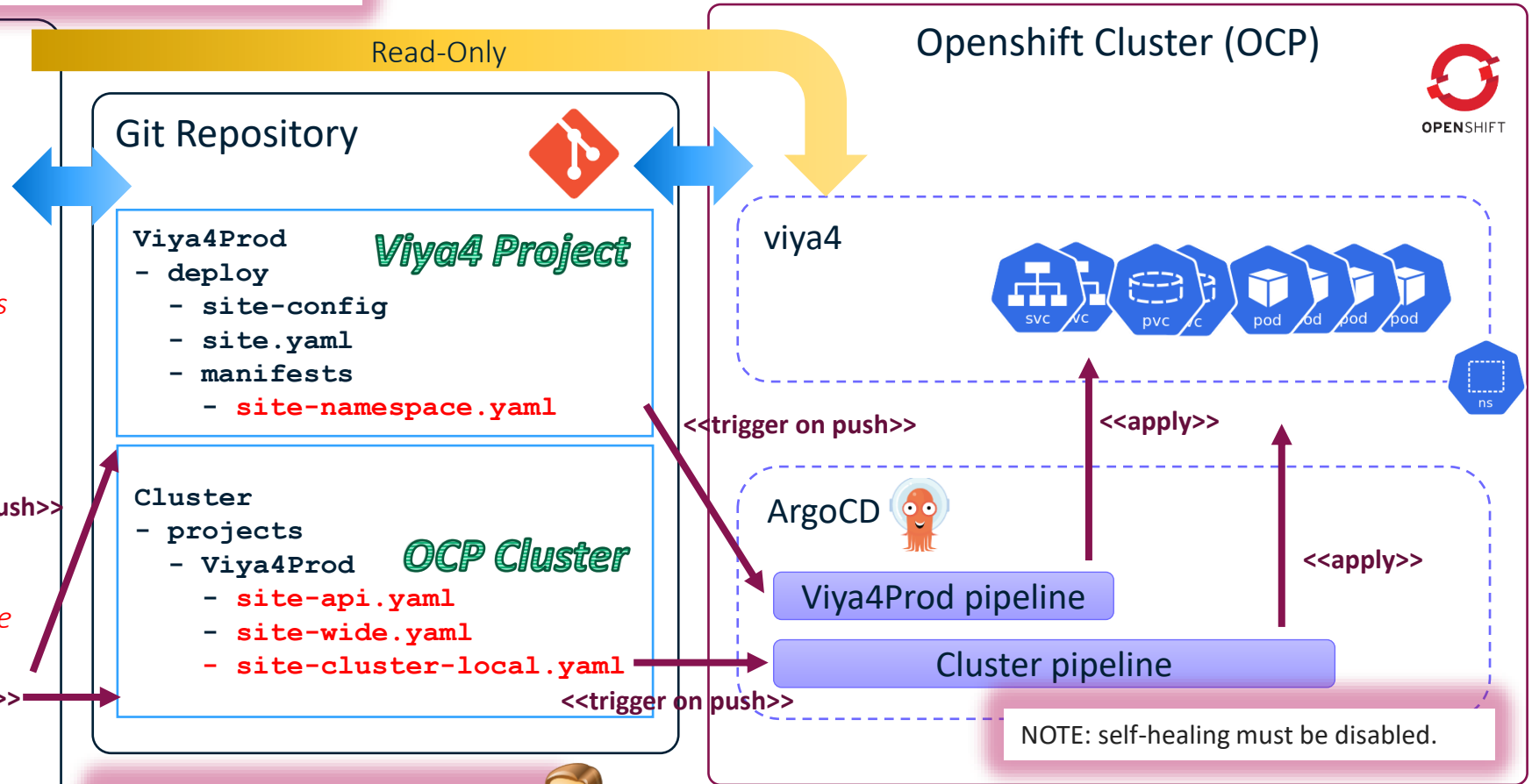
The SAS installer is granted "read only" action on the Viya4 Project on OCP



1. Get the Viya4 artifacts
Invoking a script
2. Build the Viya4 deployment manifest
Using the yq tool, the site.yaml is split into four files (one for each "step" of the deploy command)
3. Apply the pre-deployment activities
4. Apply the Viya4 manifest
The four .yaml manifests are pushed on two different Git Repository (one associated to the OCP cluster and the other to the Viya4 project)
5. Apply the post-deployment activities



Jump host



The OCP Administrator validates and accepts the push request



Q & A





Thank you for your time!

siro.bettio@sas.com

sas.com

