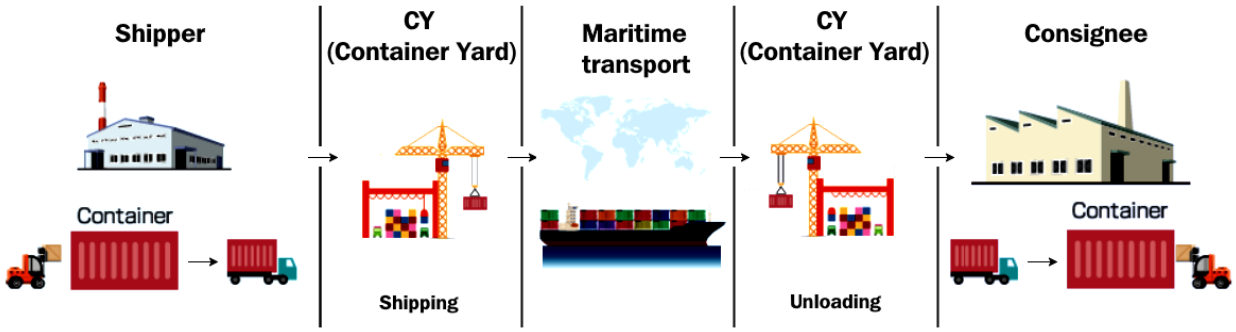
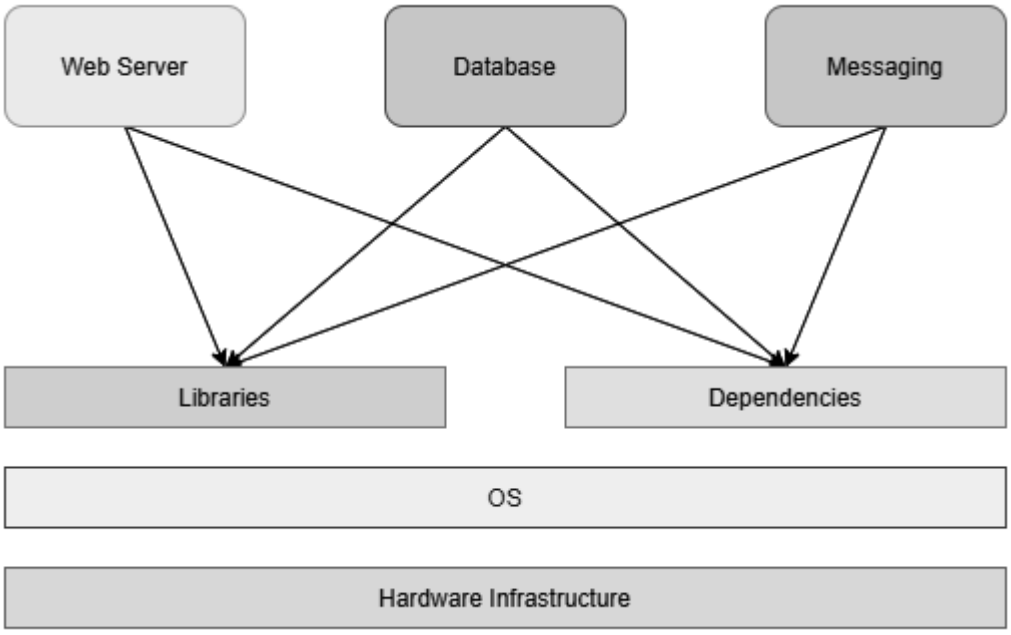
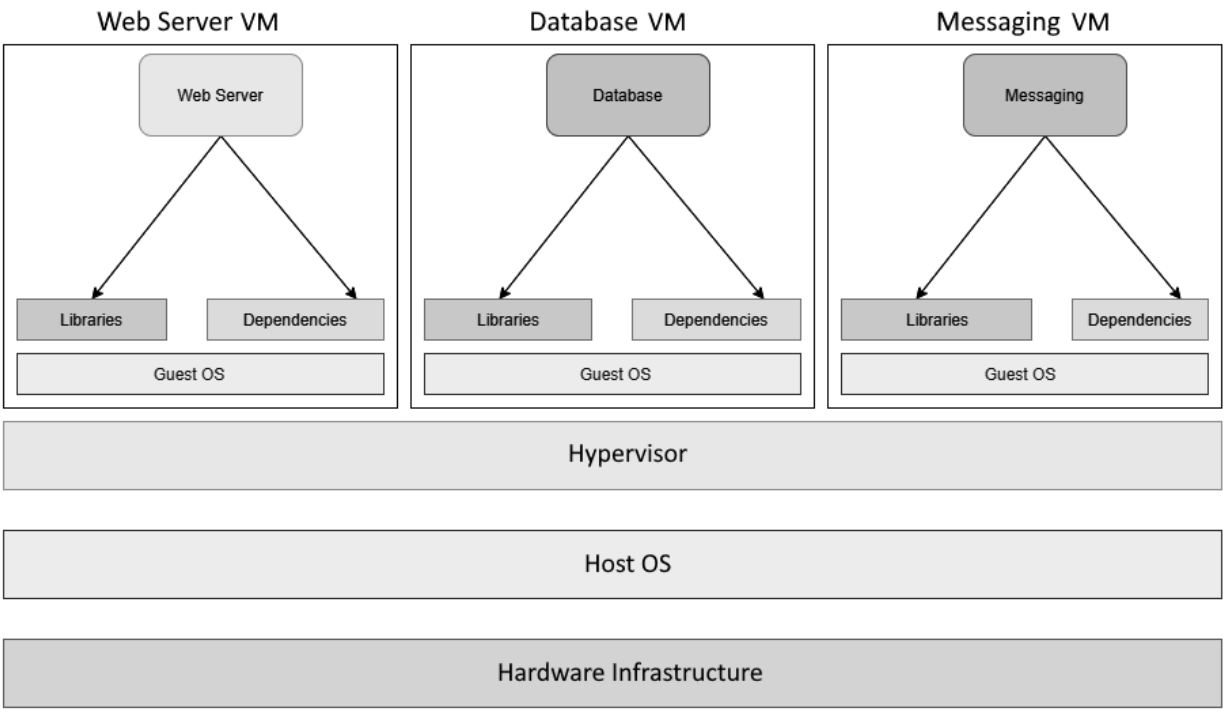
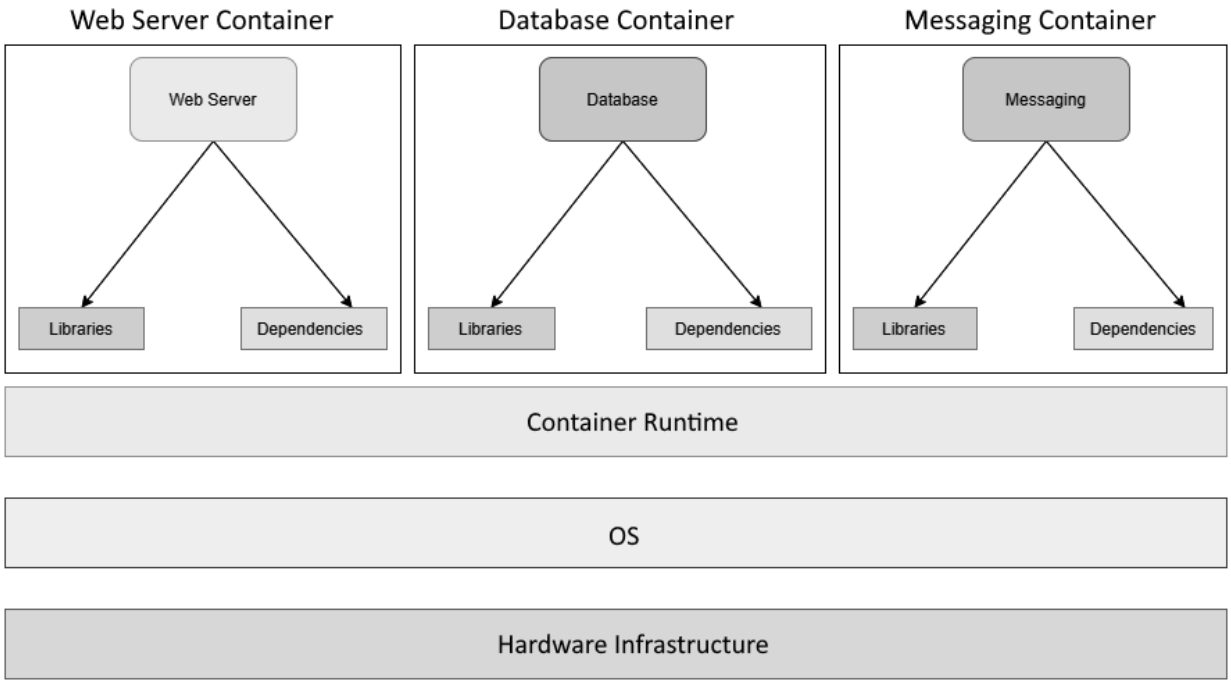
# Chapter 1: The Move to Containers

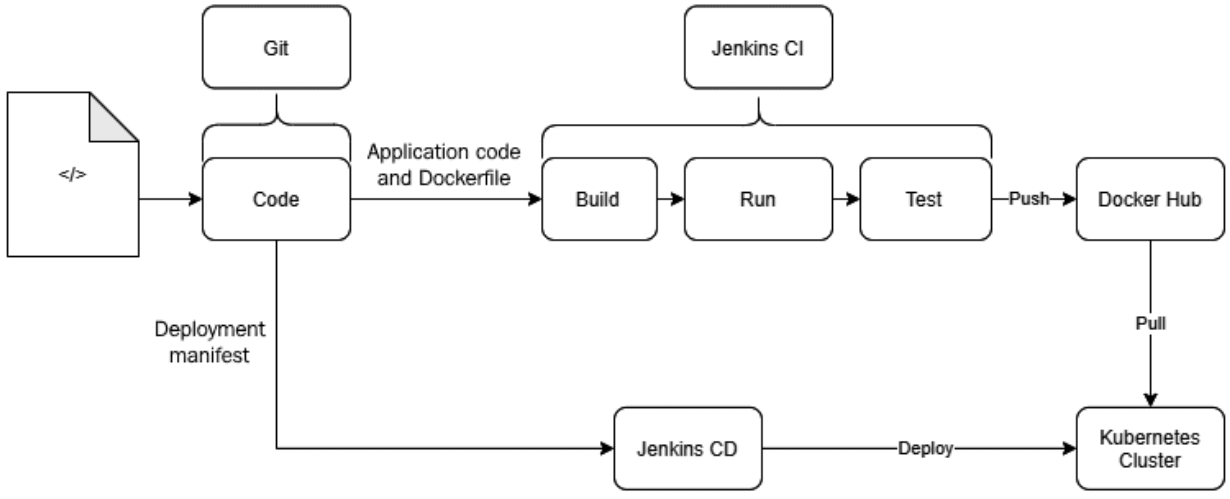


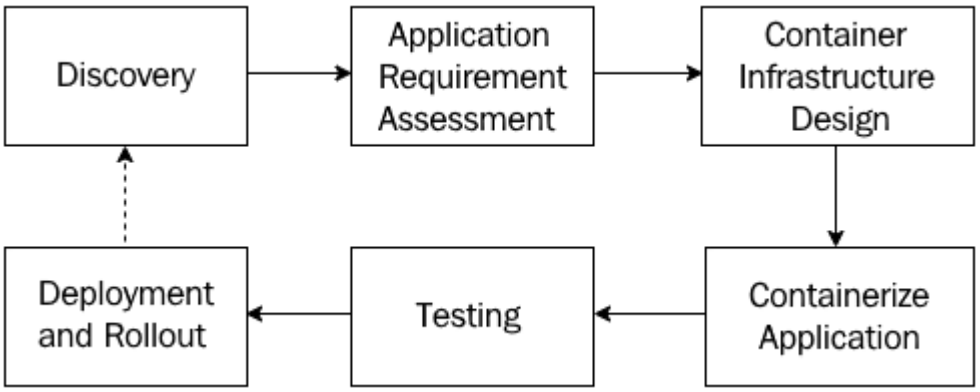



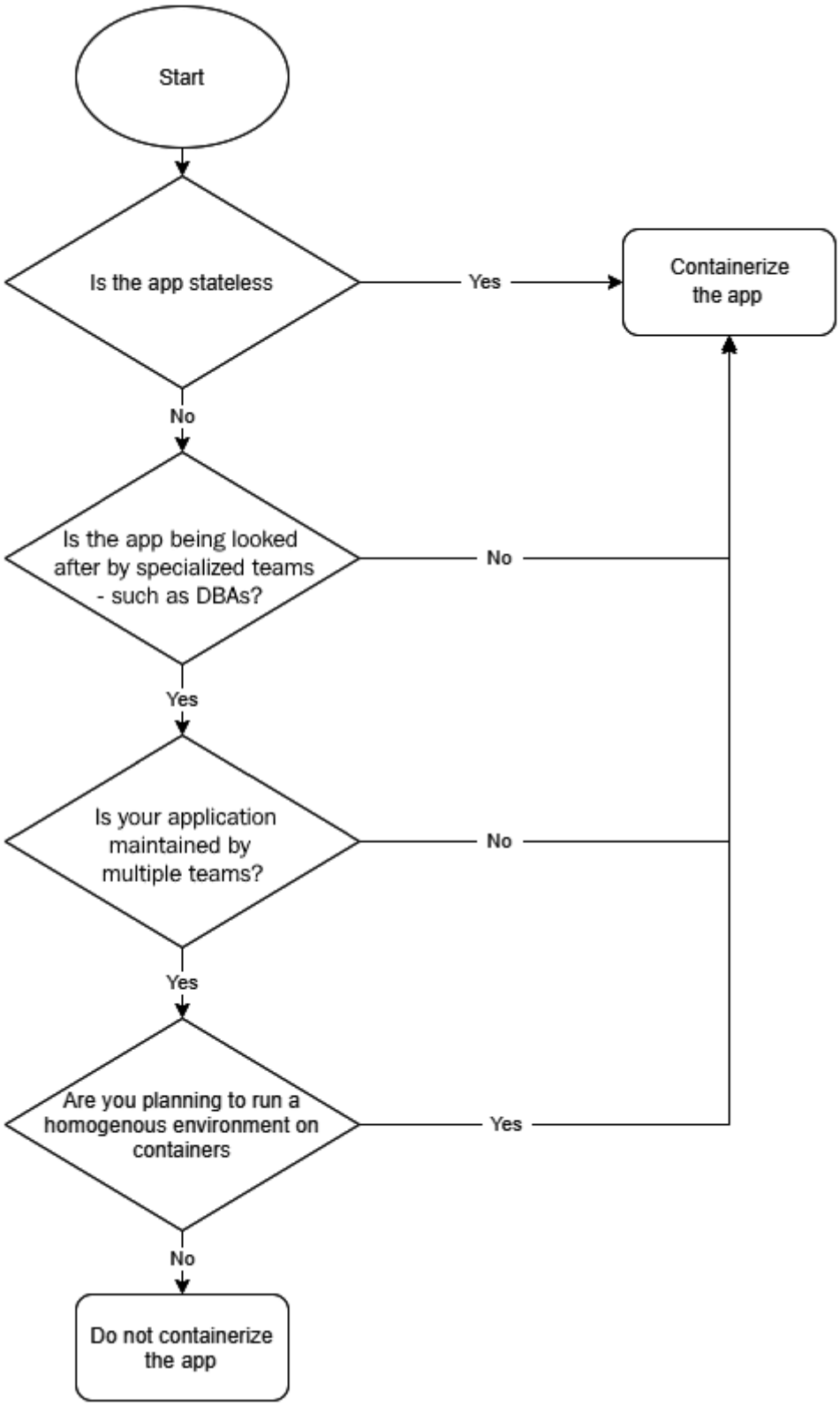

Web Server VM
Database VM
Messaging VM
Web Server
Database
Messaging
Libraries
Dependencies
Libraries
Dependencies
Libraries
Dependencies
Guest OS
Guest OS
Guest OS
Hypervisor
Host OS
Hardware Infrastructure


Web Server Container
Database Container
Messaging Container
Web Server
Database
Messaging
Libraries
Dependencies
Libraries
Dependencies
Libraries
Dependencies
Container Runtime
OS
Hardware Infrastructure

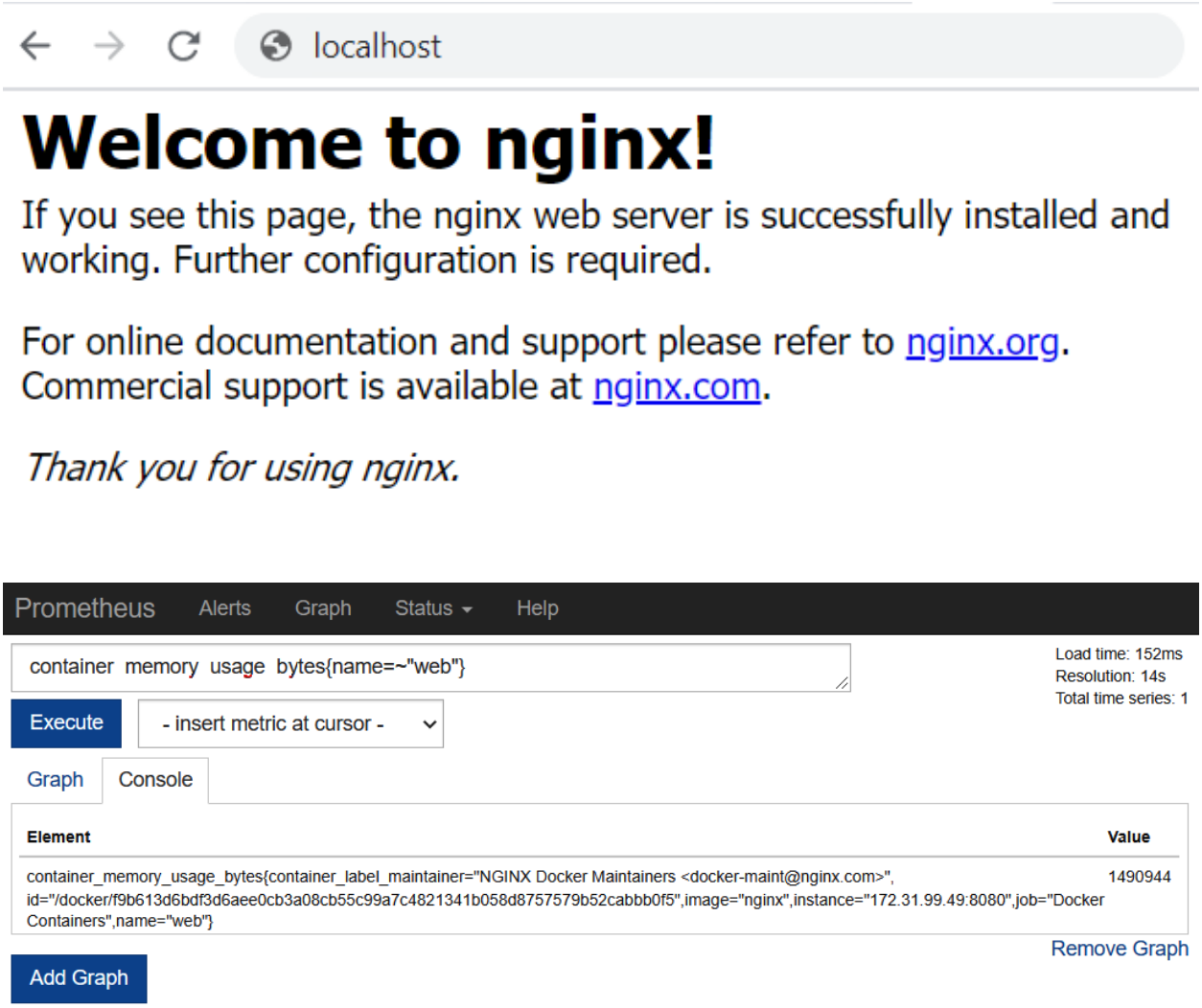
```
$ pstree
systemd─┬─NetworkManager─┬─{gdbus}
        │                └─{gmain}
        ├─Thunar
        ├─Xtightvnc
        ├─accounts-daemon─┬─{gdbus}
        │                 └─{gmain}
        ├─acpid
        ├─2*[agetty]
        ├─amazon-ssm-agen───9*[{amazon-ssm-agen}]
        ├─2*[at-spi-bus-laun─┬─dbus-daemon]
        │                    ├─{dconf worker}]
        │                    ├─{gdbus}]
        │                    └─{gmain}]
        ├─2*[at-spi2-registr─┬─{gdbus}]
        │                    └─{gmain}]
        ├─atd
        ├─avahi-daemon───avahi-daemon
        ├─colord─┬─{gdbus}
        │        └─{gmain}
        ├─containerd─┬─containerd-shim─┬─nginx───nginx
        │            │                 └─9*[{containerd-shim}]
        │            └─12*[{containerd}]
```

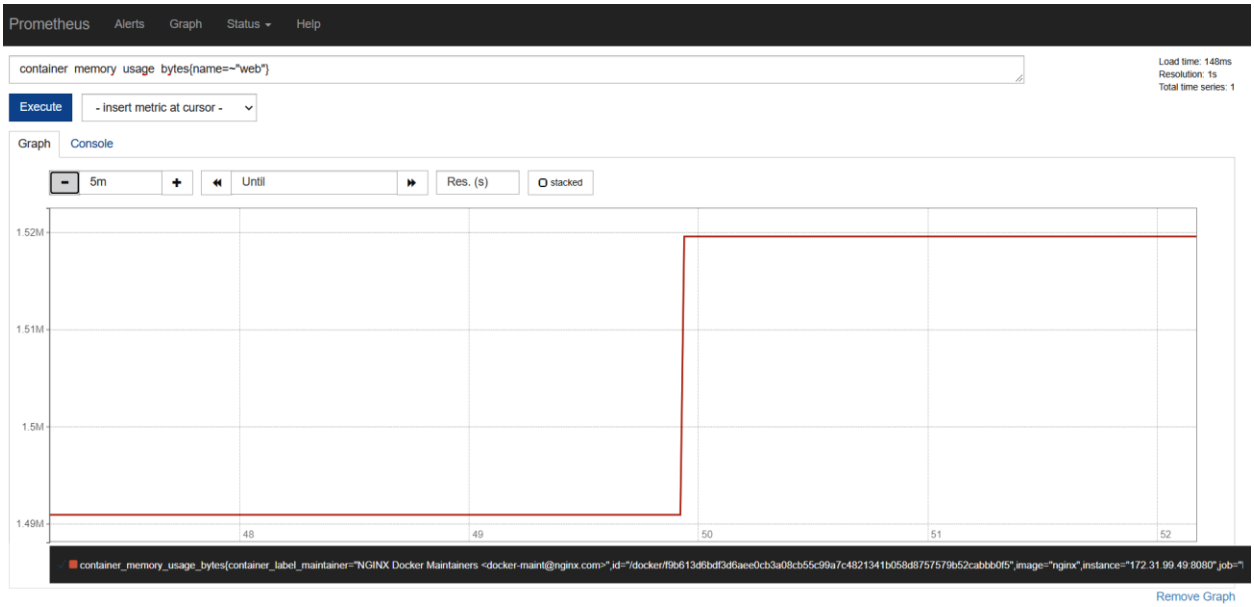



Discovery
Application Requirement Assessment
Container Infrastructure Design
Containerize Application
Testing
Deployment and Rollout


Start
Is the app stateless
Yes
Containerize the app
No
Is the app being looked after by specialized teams - such as DBAs?
No
Yes
Is your application maintained by multiple teams?
No
Yes
Are you planning to run a homogenous environment on containers
Yes
No
Do not containerize the app

# Chapter 2: Containerization with Docker




Prometheus
Alerts
Graph
Status
Help
container_memory_usage_bytes{name=~"web"}
Load time: 148ms
Resolution: 1s
Total time series: 1
Execute
- insert metric at cursor -
Graph
Console
5m
Until
Res. (s)
stacked
1.52M
1.51M
1.5M
1.49M
48
49
50
51
52
container_memory_usage_bytes{container_label_maintainer="NGINX Docker Maintainers <docker-maint@nginx.com>",id="/docker/f9b613d6bdf3d6aee0cb3a08cb55c99a7c4821341b058d8757579b52cabbb0f5",image="nginx",instance="172.31.99.49:8080",job="
Remove Graph

Prometheus Alerts Graph Status Help

node_cpu{instance="172.31.99.49:9100",job="node_exporter"}

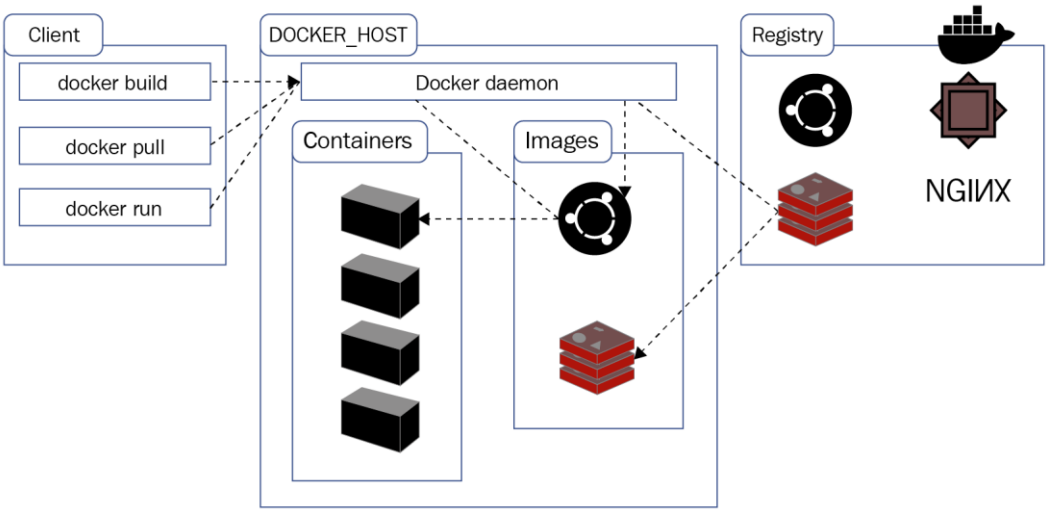
Load time: 127ms
Resolution: 14s
Total time series: 20

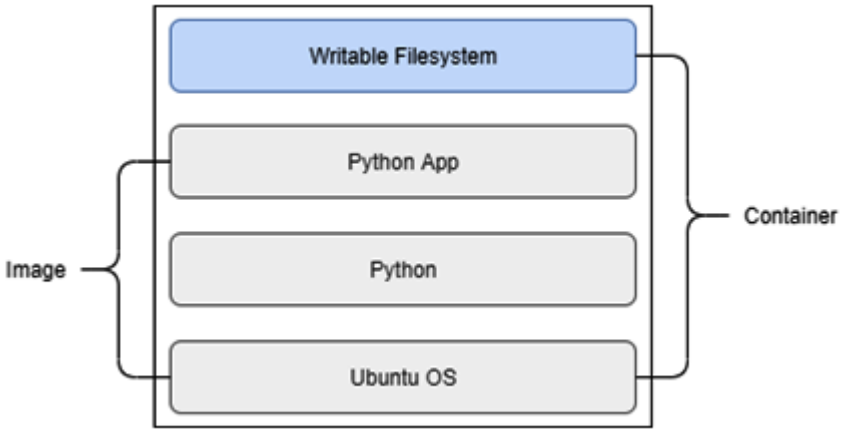
Execute - insert metric at cursor -

Graph Console

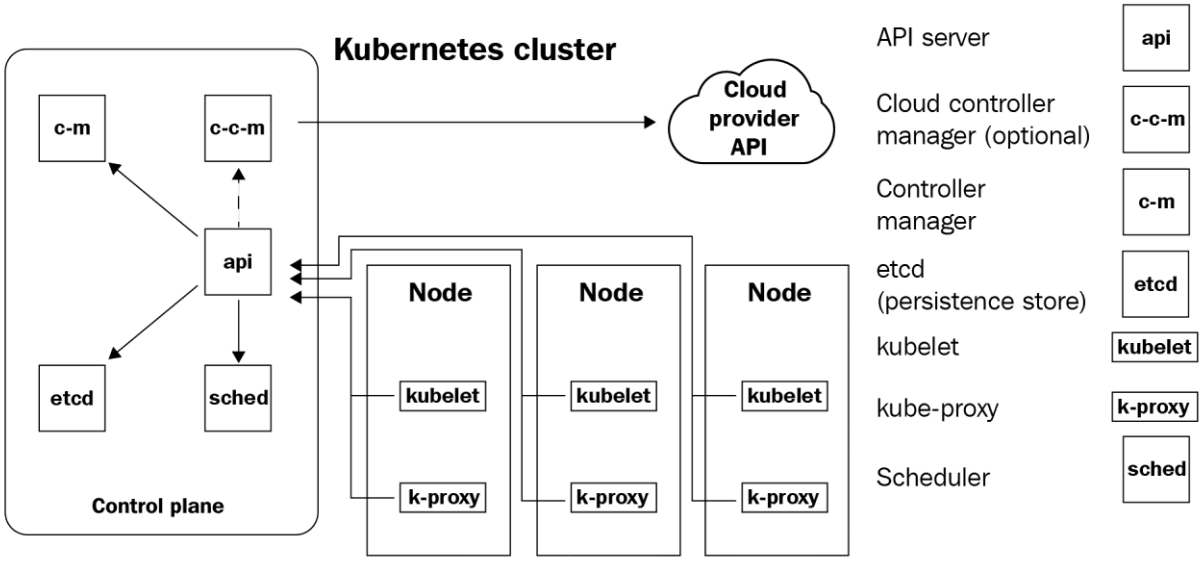
| Element | Value |
|---|---|
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="guest"} | 0 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="guest_nice"} | 0 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="idle"} | 8601.59 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="iowait"} | 63.45 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="irq"} | 0 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="nice"} | 767.56 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="softirq"} | 16.25 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="steal"} | 29.04 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="system"} | 204.94 |
| node_cpu{cpu="cpu0",instance="172.31.99.49:9100",job="node_exporter",mode="user"} | 220.51 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="guest"} | 0 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="guest_nice"} | 0 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="idle"} | 8555.62 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="iowait"} | 104.14 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="irq"} | 0 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="nice"} | 752.6 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="softirq"} | 21.74 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="steal"} | 44.96 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="system"} | 210.2 |
| node_cpu{cpu="cpu1",instance="172.31.99.49:9100",job="node_exporter",mode="user"} | 221.86 |

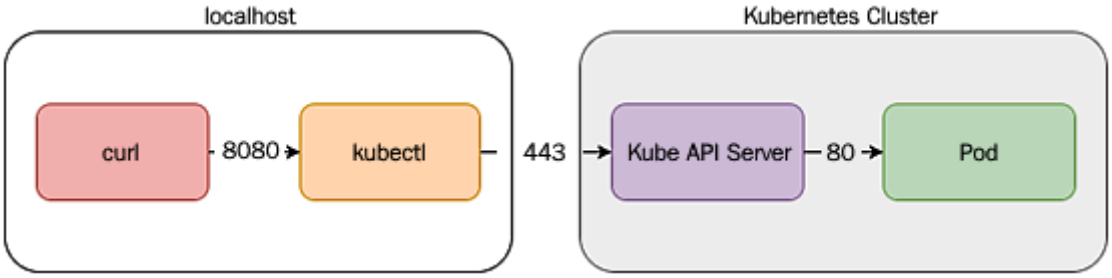
# Chapter 3: Creating and Managing Container Images

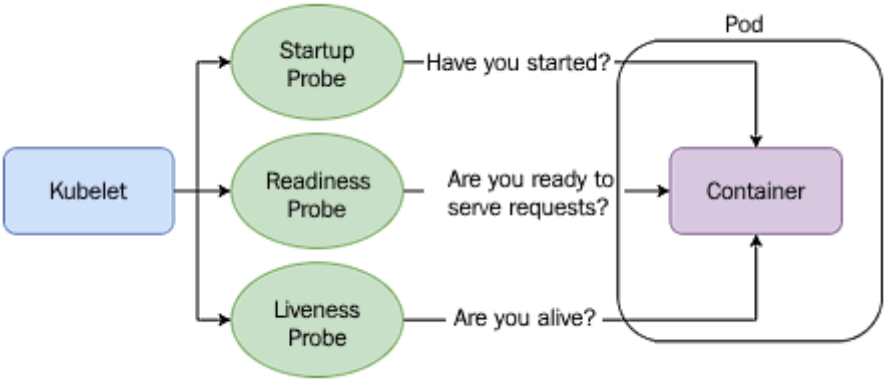


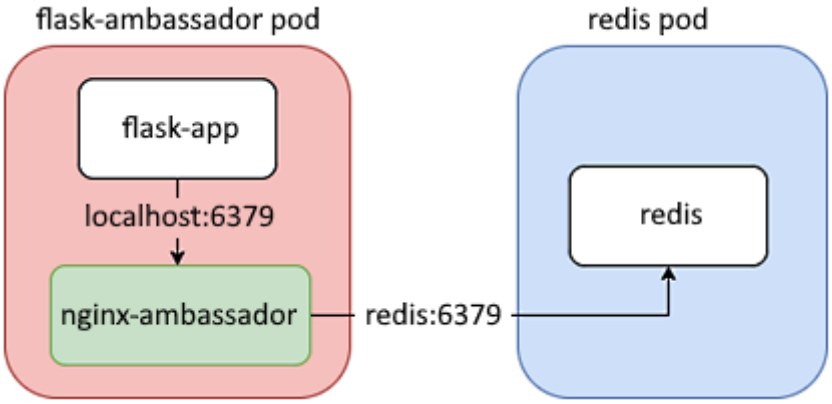



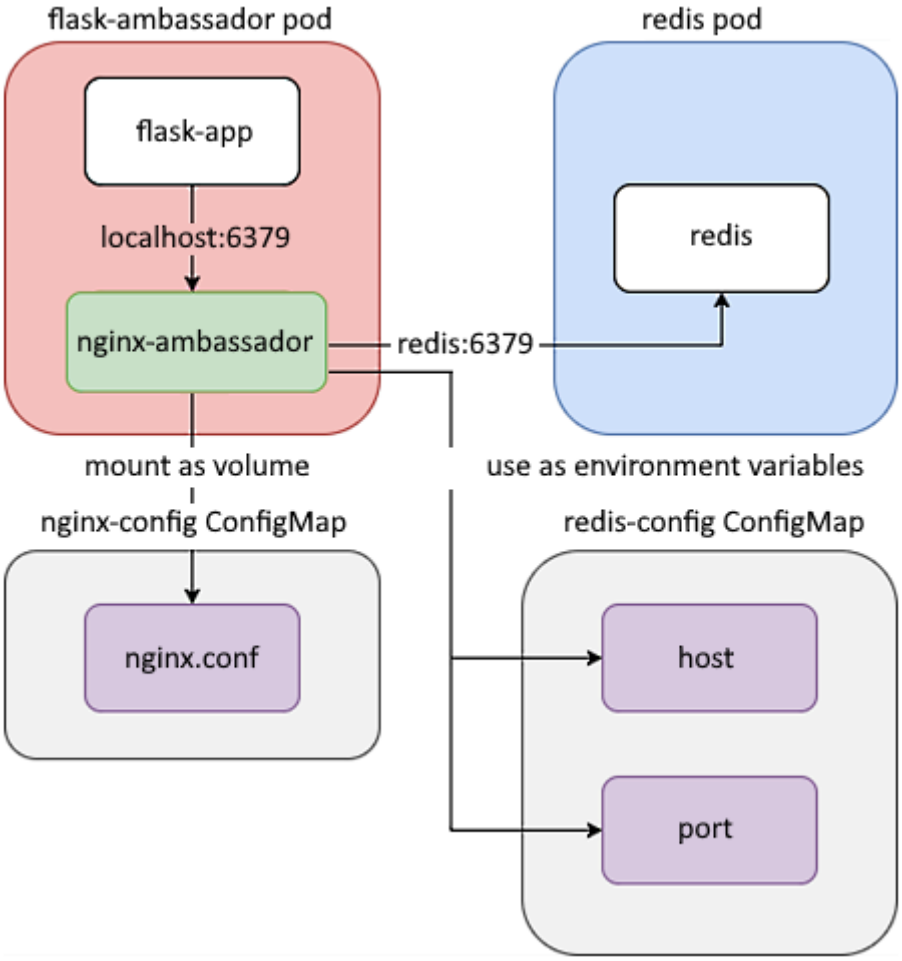
# Chapter 4: Container Orchestration with Kubernetes – Part I

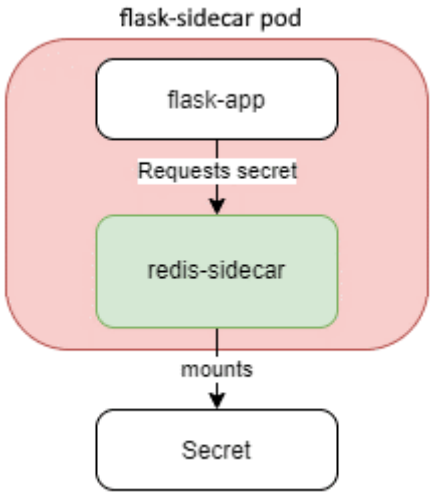


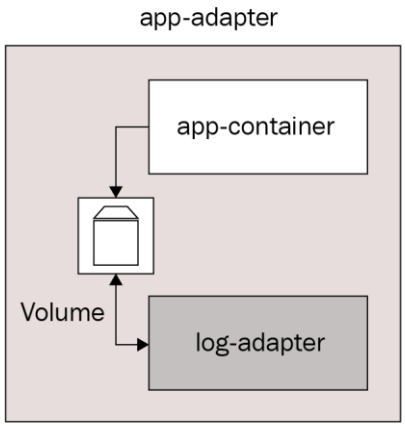



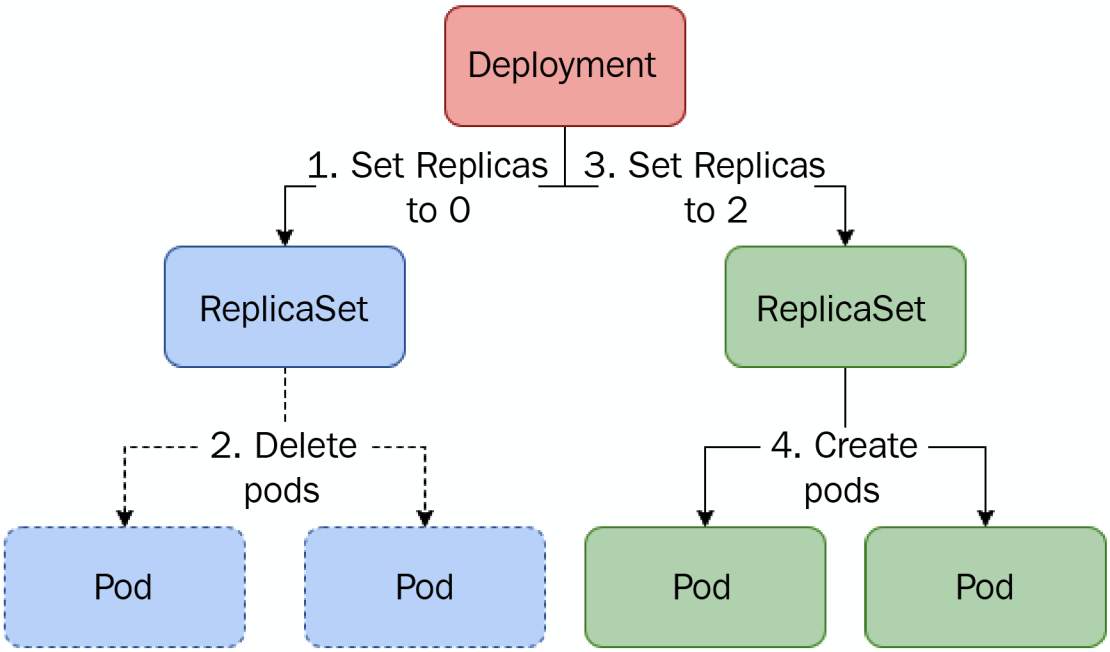

flask-ambassador pod
redis pod
flask-app
localhost:6379
nginx-ambassador
redis:6379
redis

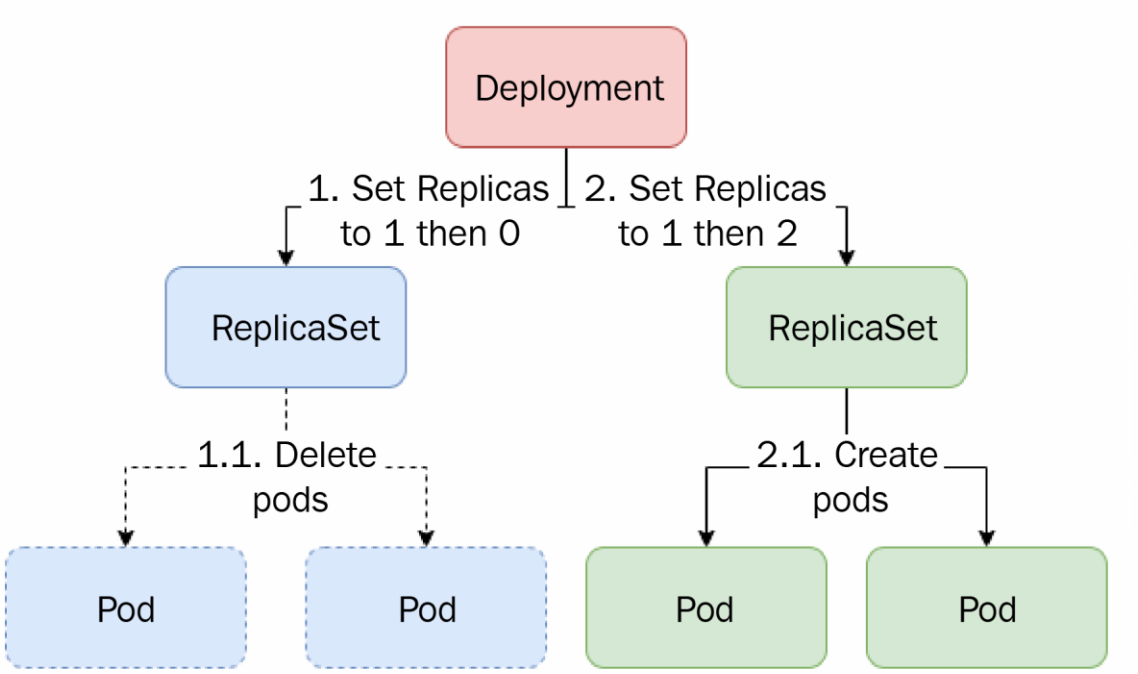

flask-ambassador pod
redis pod
flask-app
localhost:6379
nginx-ambassador
redis:6379
redis
mount as volume
use as environment variables
nginx-config ConfigMap
redis-config ConfigMap
nginx.conf
host
port

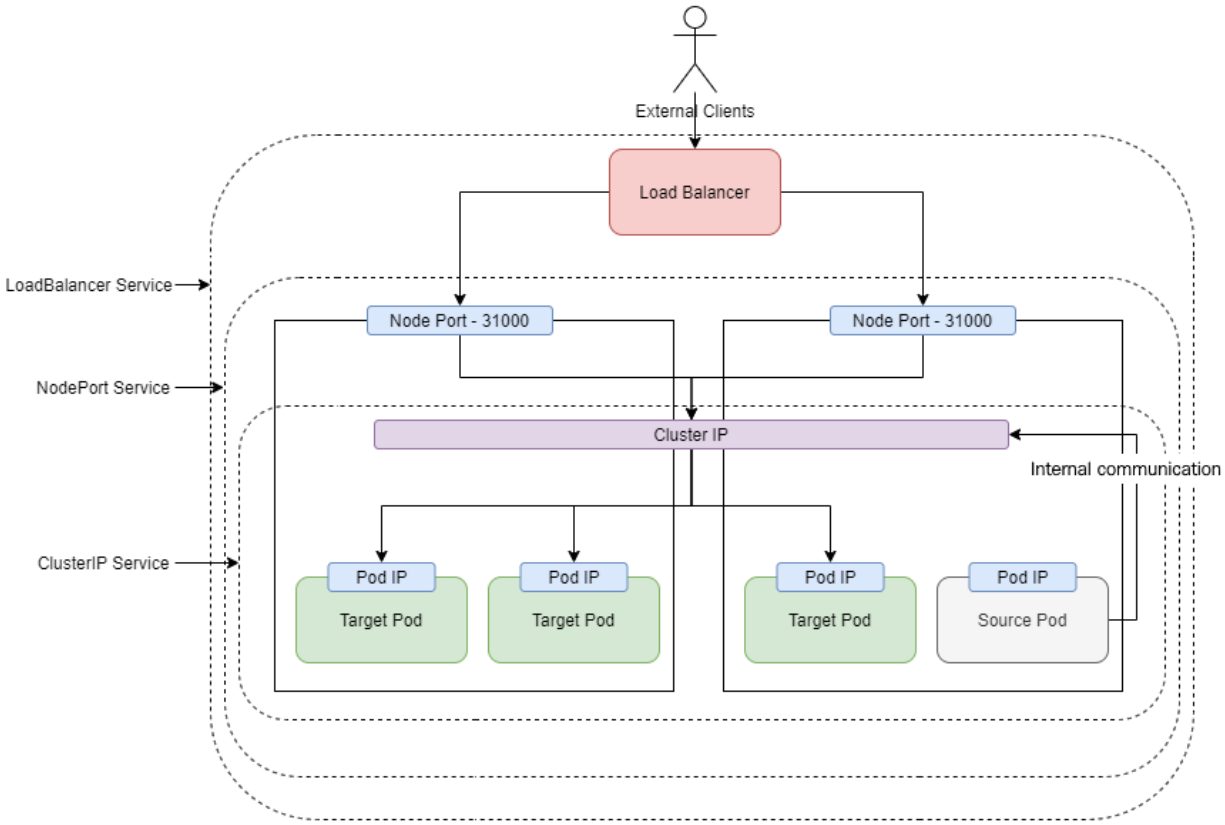

flask-sidecar pod
flask-app
Requests secret
redis-sidecar
mounts
Secret

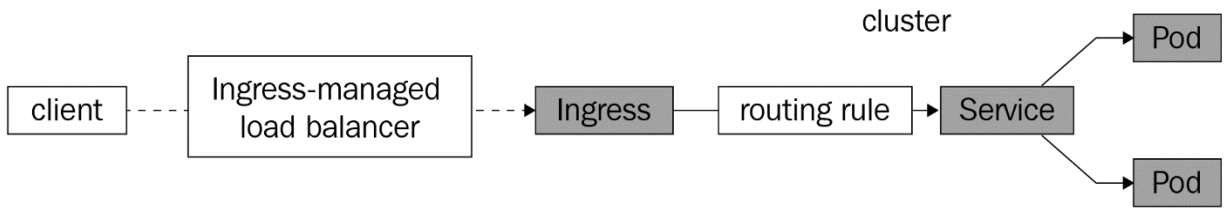

app-adapter
app-container
Volume
log-adapter

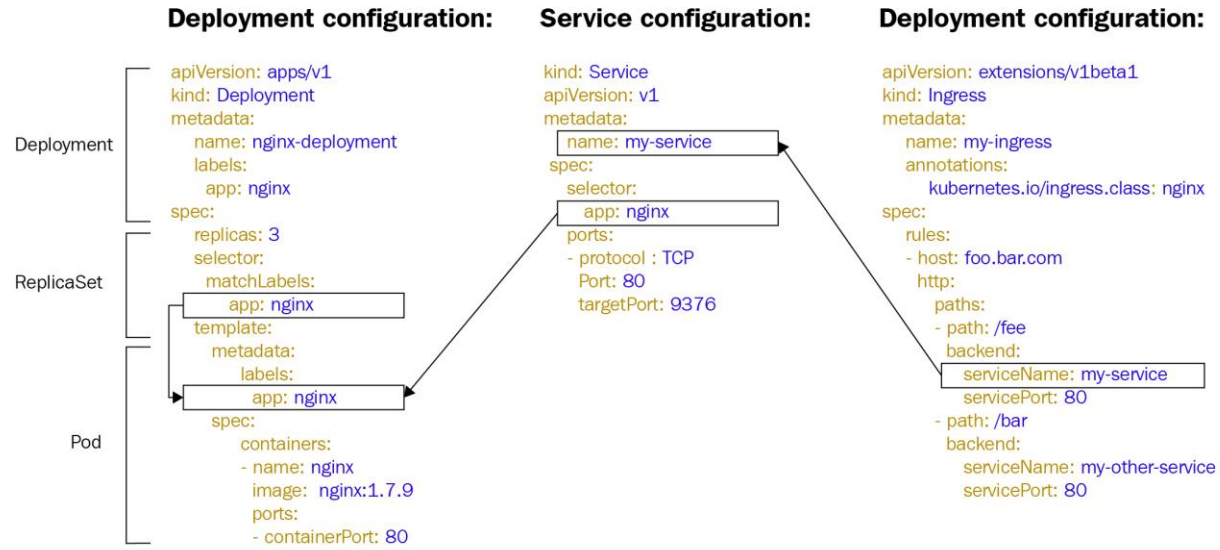
# Chapter 5: Container Orchestration with Kubernetes – Part II

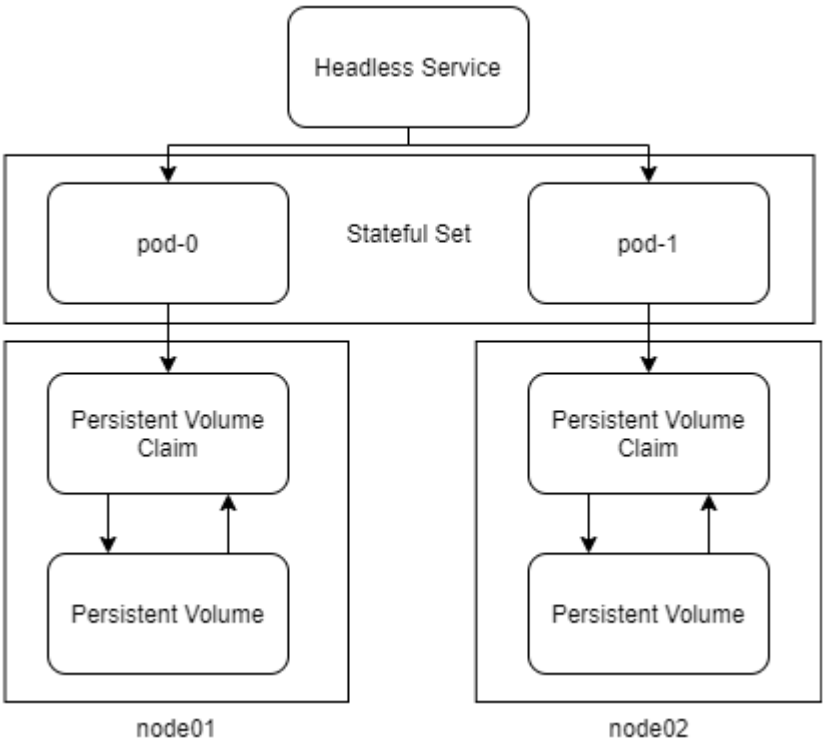



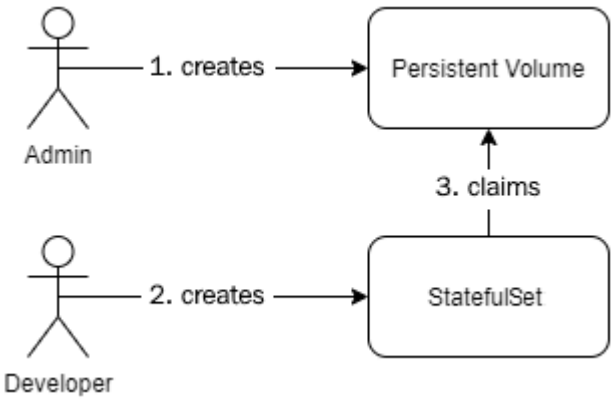

Deployment
1. Set Replicas to 1 then 0
2. Set Replicas to 1 then 2
ReplicaSet
ReplicaSet
1.1. Delete pods
2.1. Create pods
Pod
Pod
Pod
Pod

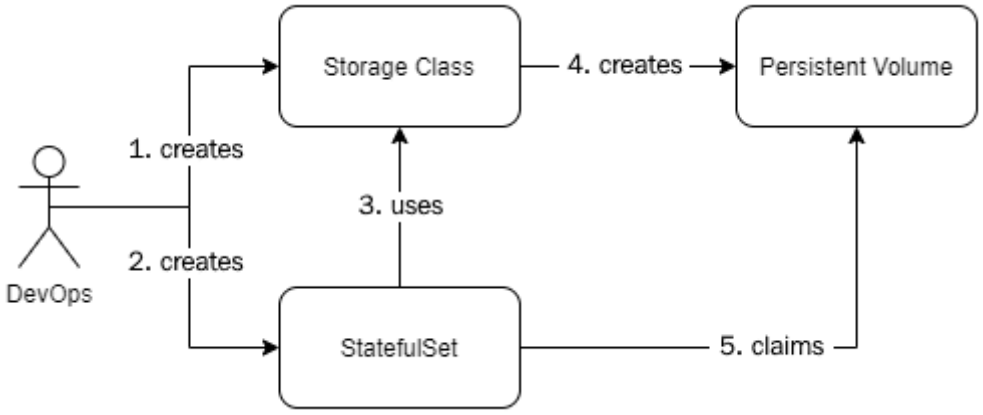

External Clients
Load Balancer
LoadBalancer Service
NodePort Service
ClusterIP Service
Node Port - 31000
Node Port - 31000
Cluster IP
Internal communication
Pod IP
Target Pod
Pod IP
Target Pod
Pod IP
Target Pod
Pod IP
Source Pod


cluster
client
Ingress-managed load balancer
Ingress
routing rule
Service
Pod
Pod

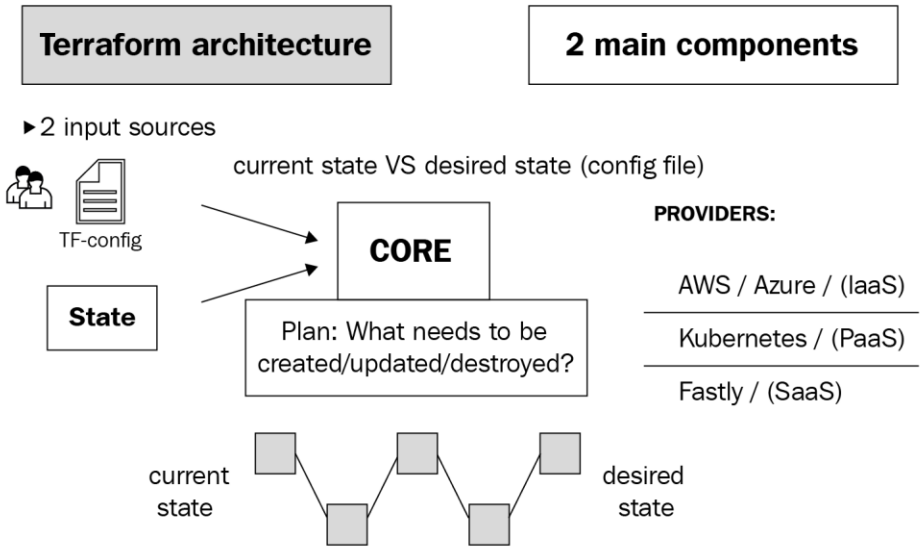

Deployment configuration:
Service configuration:
Deployment configuration:
Deployment
ReplicaSet
Pod
apiVersion: apps/v1
kind: Deployment
metadata:
name: nginx-deployment
labels:
app: nginx
spec:
replicas: 3
selector:
matchLabels:
app: nginx
template:
metadata:
labels:
app: nginx
spec:
containers:
- name: nginx
image: nginx:1.7.9
ports:
- containerPort: 80
kind: Service
apiVersion: v1
metadata:
name: my-service
spec:
selector:
app: nginx
ports:
- protocol : TCP
Port: 80
targetPort: 9376
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
name: my-ingress
annotations:
kubernetes.io/ingress.class: nginx
spec:
rules:
- host: foo.bar.com
http:
paths:
- path: /fee
backend:
serviceName: my-service
servicePort: 80
- path: /bar
backend:
serviceName: my-other-service
servicePort: 80

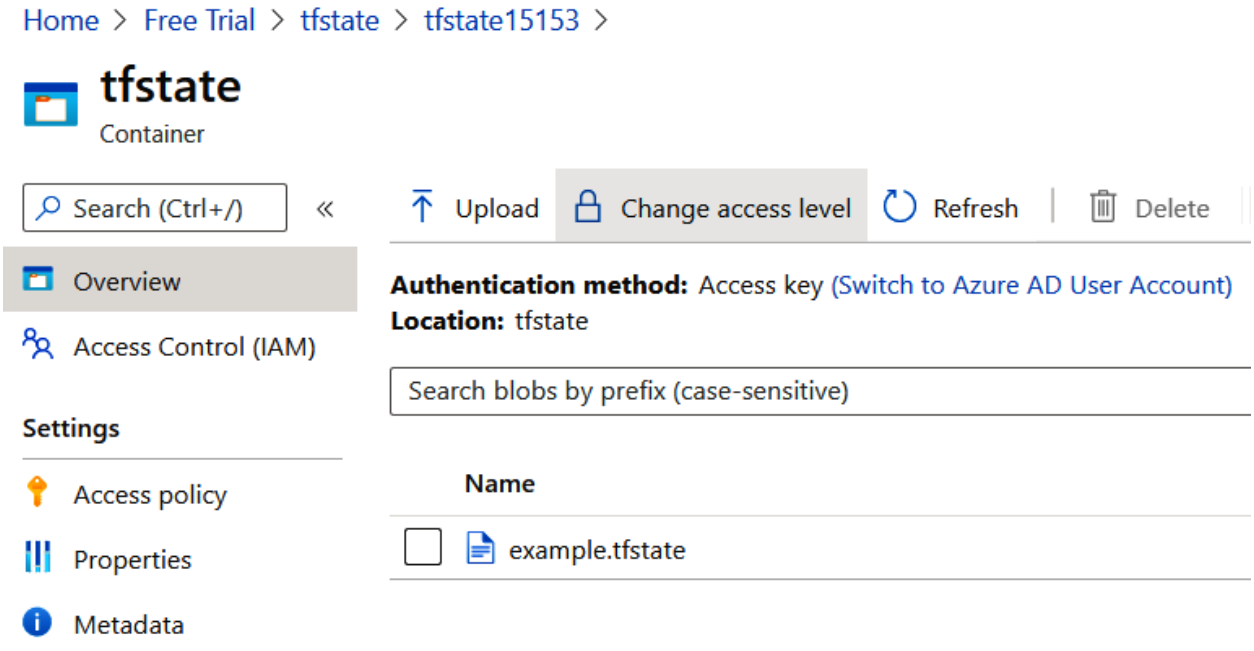

Headless Service
pod-0
Stateful Set
pod-1
Persistent Volume Claim
Persistent Volume
Persistent Volume Claim
Persistent Volume
node01
node02


1. creates
Persistent Volume
Admin
3. claims
2. creates
StatefulSet
Developer


Storage Class
4. creates
Persistent Volume
1. creates
3. uses
2. creates
DevOps
StatefulSet
5. claims

# Chapter 6: Infrastructure as Code (IaC) with Terraform



# Resource groups

Default Directory

Add | Manage view | Refresh | Export to CSV | Open query | Assign tags | Feedback

terraform-ws | Subscription == **all** | Location == **all** | Add filter

Showing 1 to 2 of 2 records.

| Name |
| --- |
| terraform-ws-dev |
| terraform-ws-test |

# terraform-ws-dev

Resource group

Add | Edit columns | Delete resource group | Refresh | Export to CSV | Open query | Assign tags | Move

**Essentials**

Filter by name... | Type == **all** | Location == **all** | Add filter

Showing 1 to 4 of 4 records. Show hidden types

| Name | Type |
| --- | --- |
| app-network | Virtual network |
| app-nic | Network interface |
| httpd | Virtual machine |
| httpd-osdisk | Disk |

# terraform-ws-test

Resource group

Add | Edit columns | Delete resource group | Refresh | Export to CSV | Open query | Assign tags | Move

**Essentials**

Filter by name... | Type == **all** | Location == **all** | Add filter

Showing 1 to 4 of 4 records. Show hidden types

| Name | Type |
| --- | --- |
| app-network | Virtual network |
| app-nic | Network interface |
| httpd | Virtual machine |
| httpd-osdisk | Disk |

# tfstate

Container

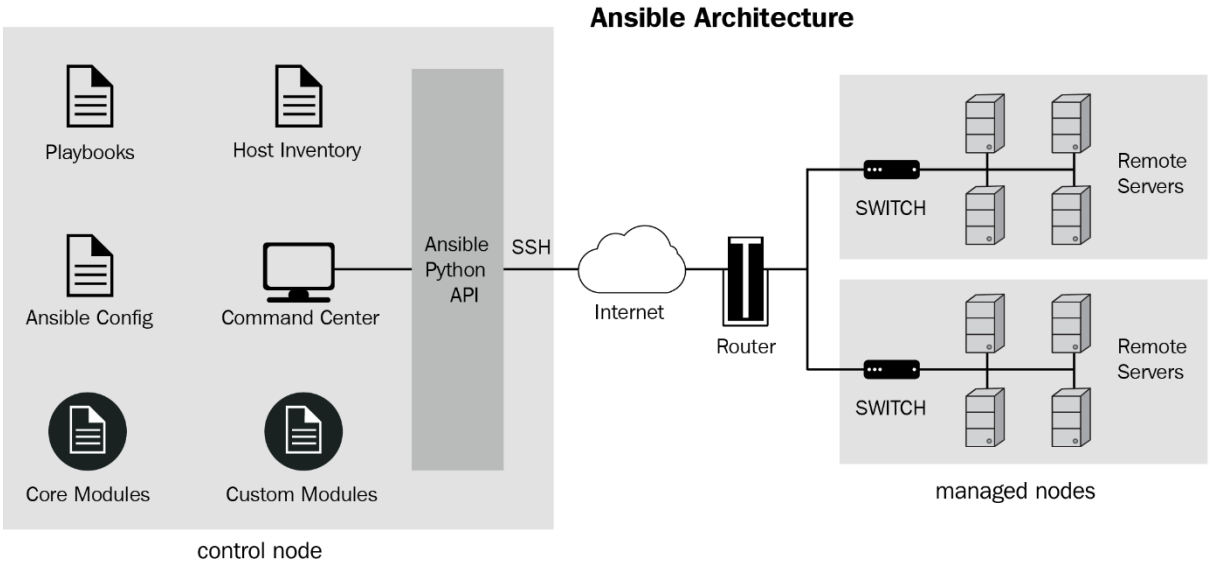
Upload | Change access level | Refresh | Delete

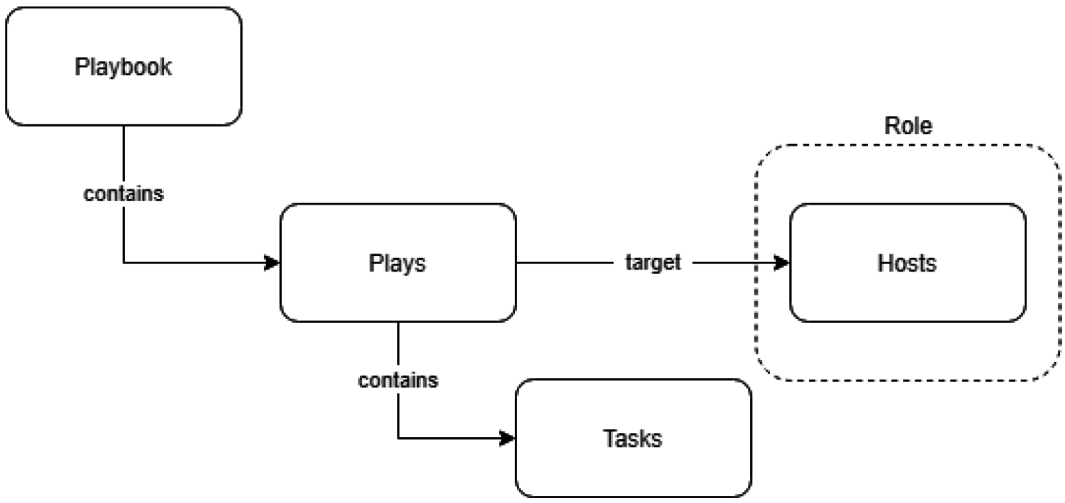
**Authentication method:** Access key (Switch to Azure AD User Account)
**Location:** tfstate

ws

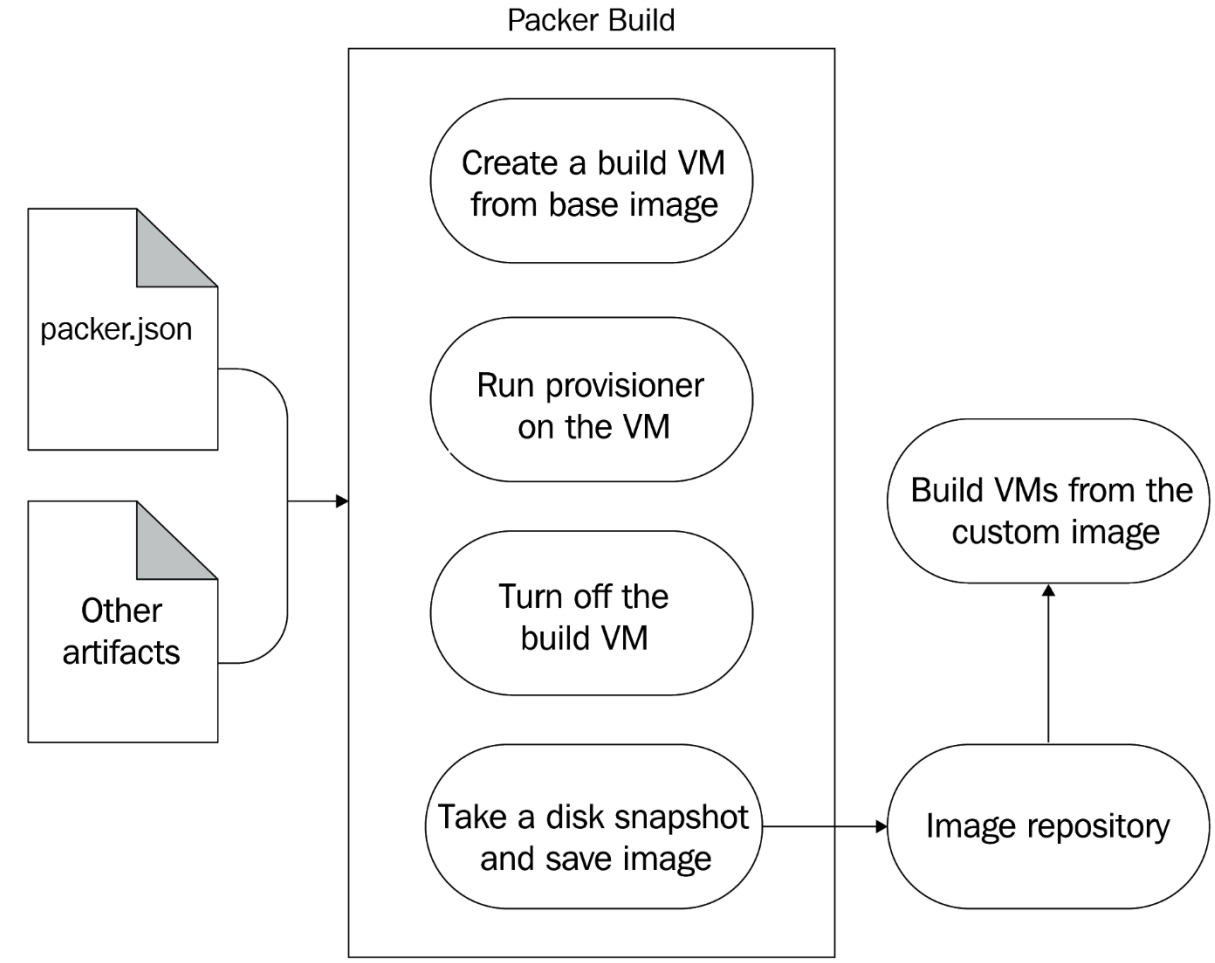
| Name |
| --- |
| ws.tfstateenv:dev |
| ws.tfstateenv:test |

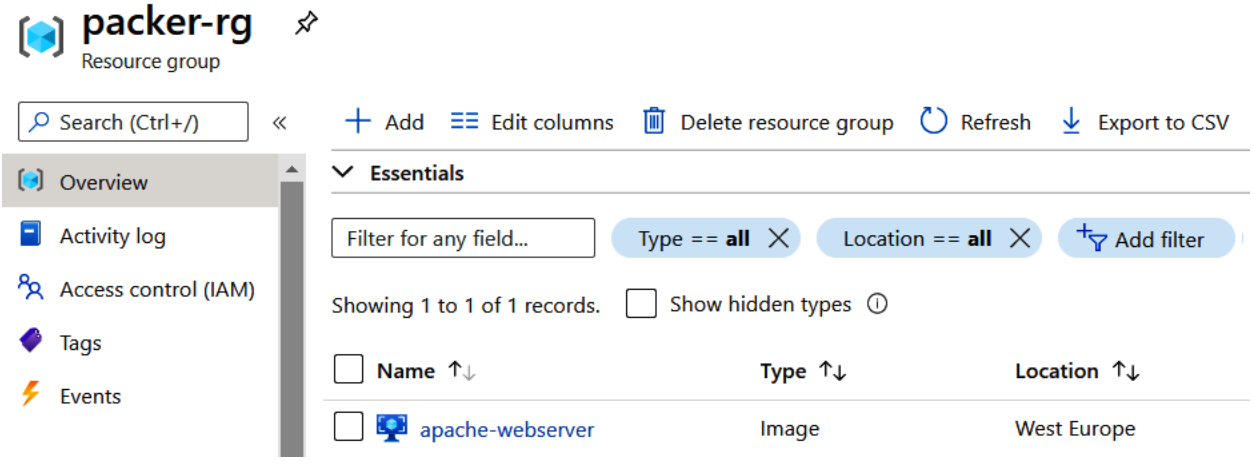
# Chapter 7: Configuration Management with Ansible

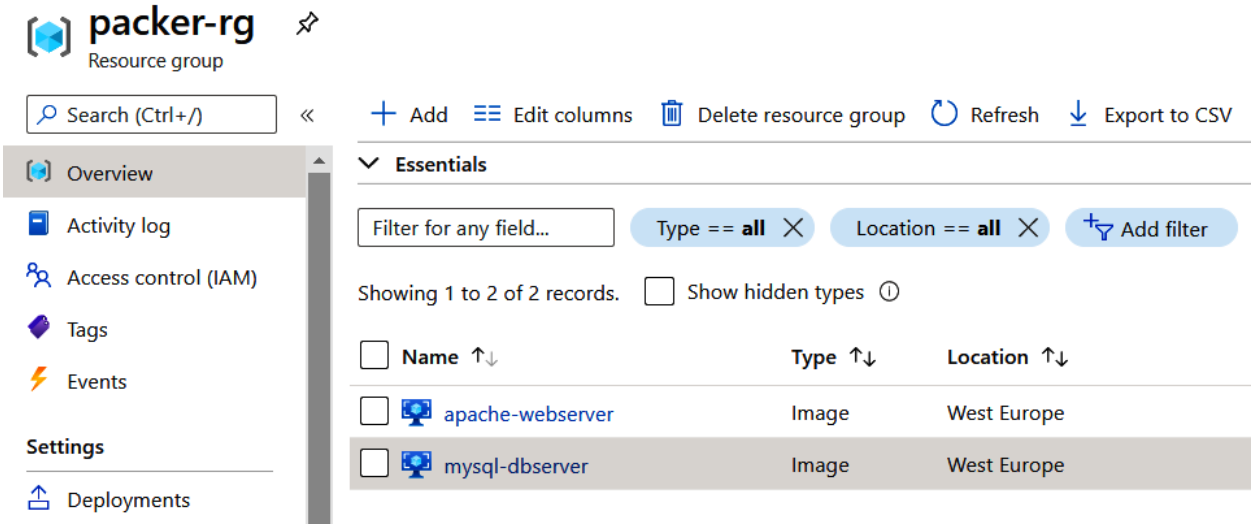


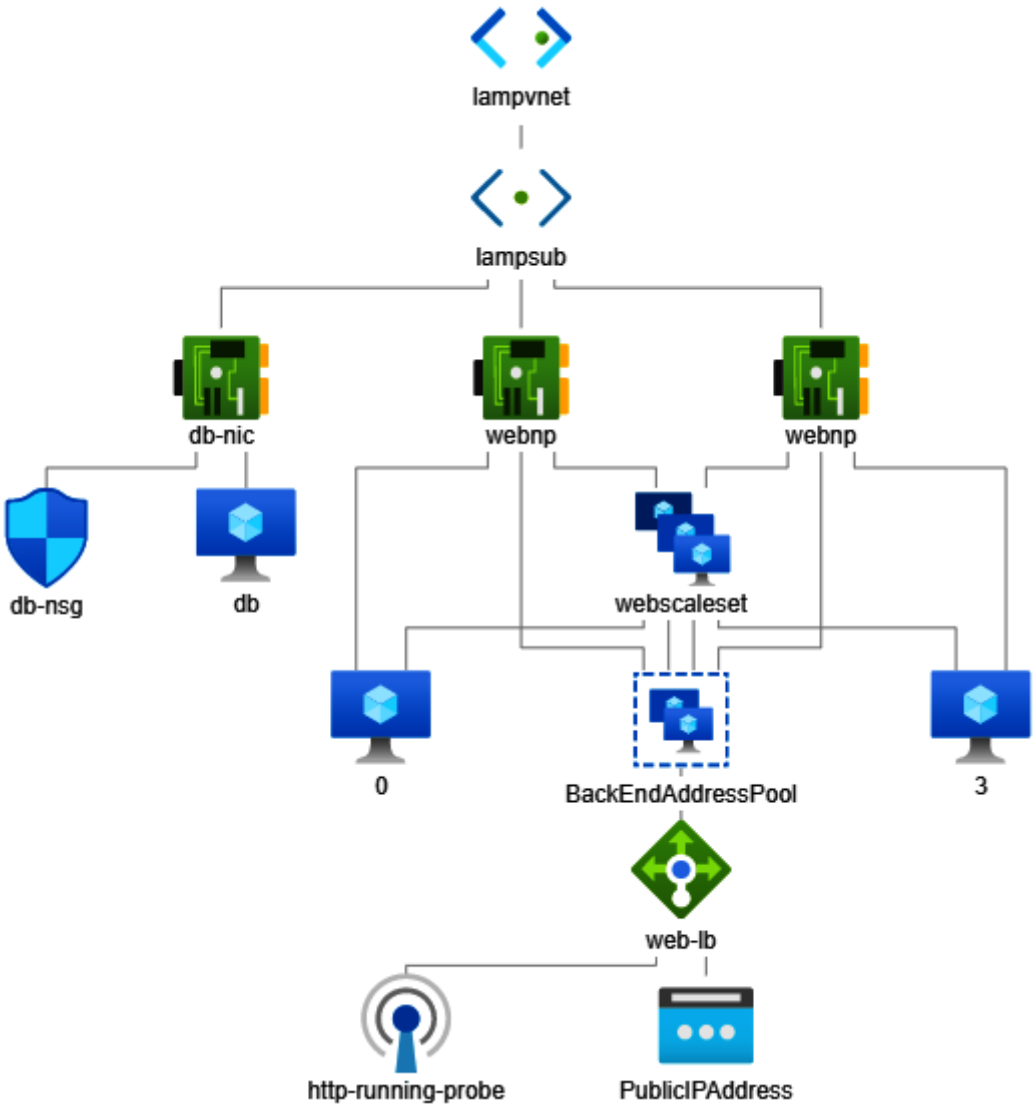



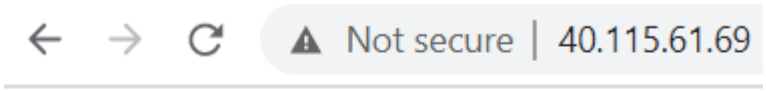
# Chapter 8: IaC and Config Management in Action



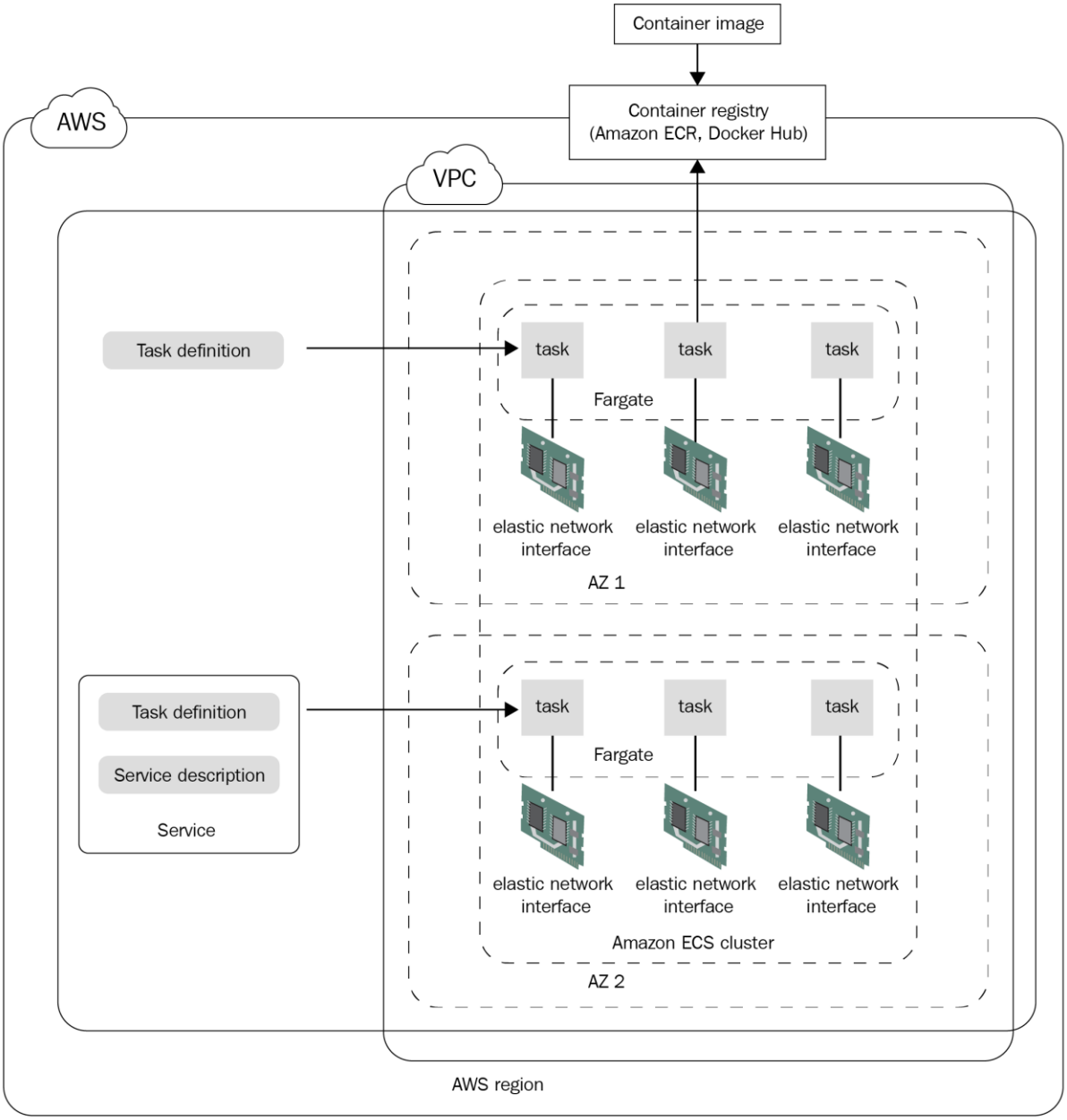

packer-rg
Resource group
Search (Ctrl+/)
Overview
Activity log
Access control (IAM)
Tags
Events
Settings
Deployments
Add
Edit columns
Delete resource group
Refresh
Export to CSV
Essentials
Filter for any field...
Type == all
Location == all
Add filter
Showing 1 to 2 of 2 records.
Show hidden types
Name
Type
Location
apache-webserver
Image
West Europe
mysql-dbserver
Image
West Europe

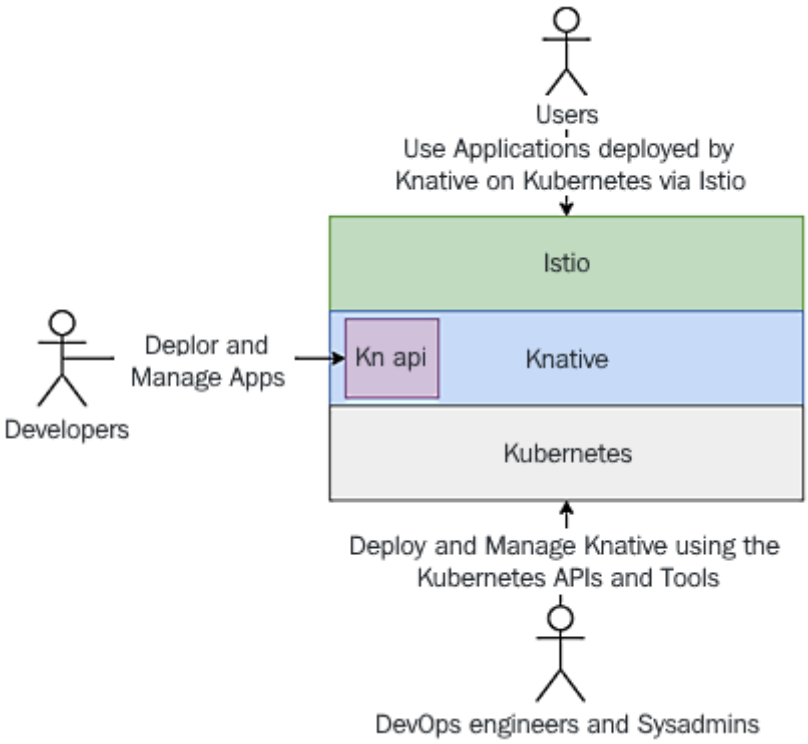


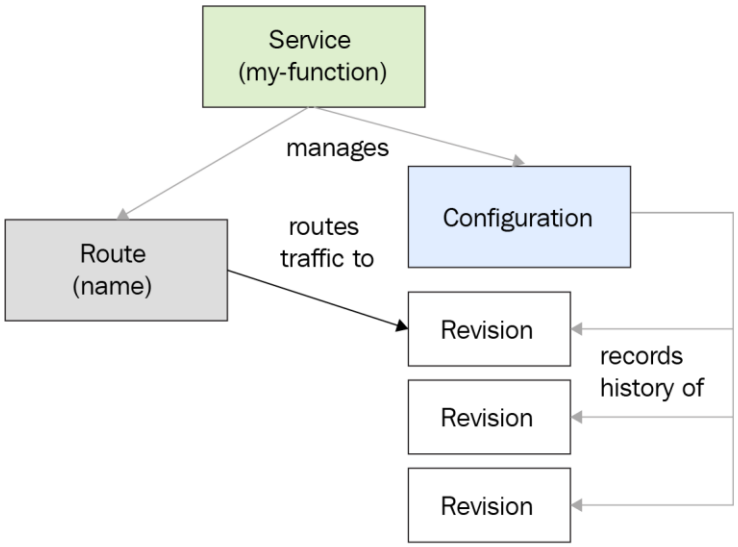




Database Connected successfully

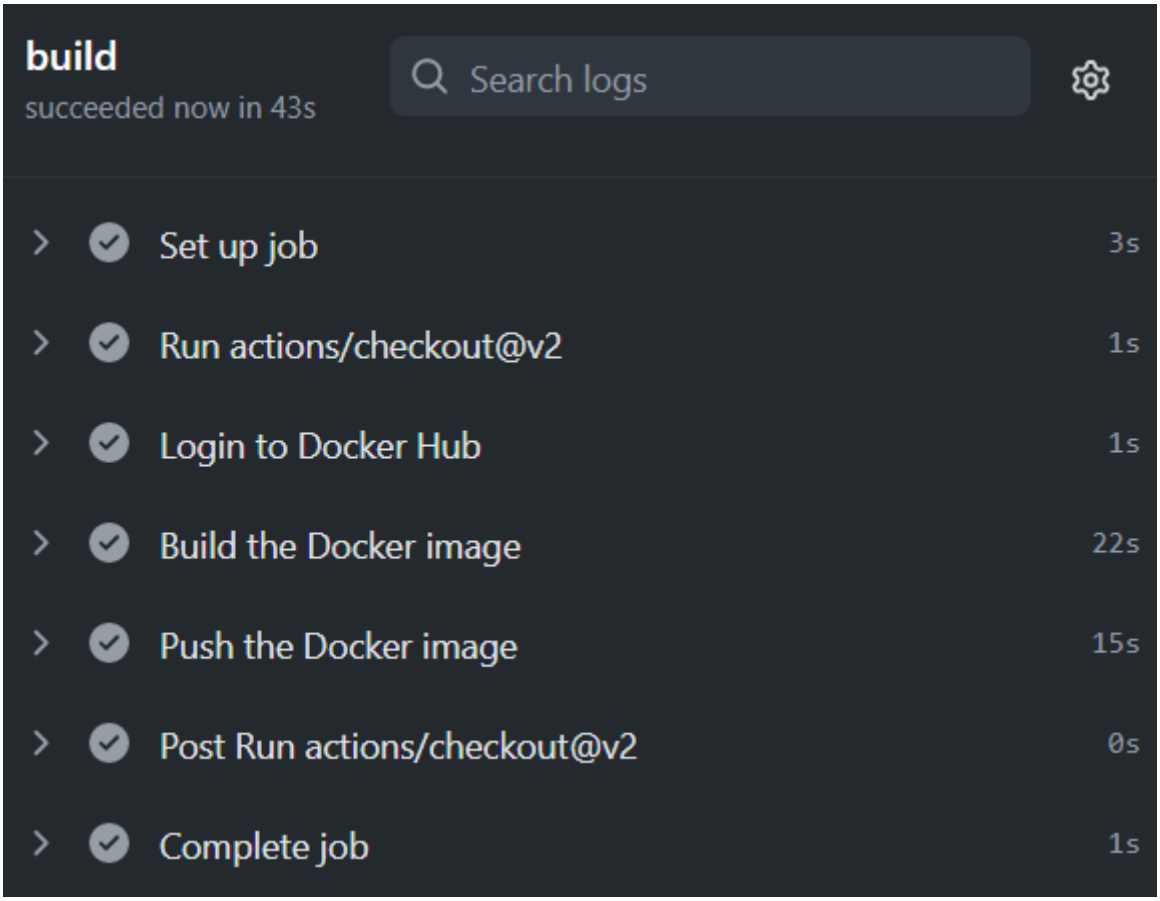
# Chapter 9: Containers as a Service (CaaS) and Serverless Computing for Containers




Users
Use Applications deployed by
Knative on Kubernetes via Istio
Istio
Kn api
Knative
Kubernetes
Deplor and
Manage Apps
Developers
Deploy and Manage Knative using the
Kubernetes APIs and Tools
DevOps engineers and Sysadmins


Service
(my-function)
manages
Configuration
Route
(name)
routes
traffic to
Revision
records
history of
Revision
Revision

## Chapter 10: Continuous Integration



# bharamicrosystems / **flask-app-gh-actions**

*This repository does not have a description*

Last pushed: 4 minutes ago

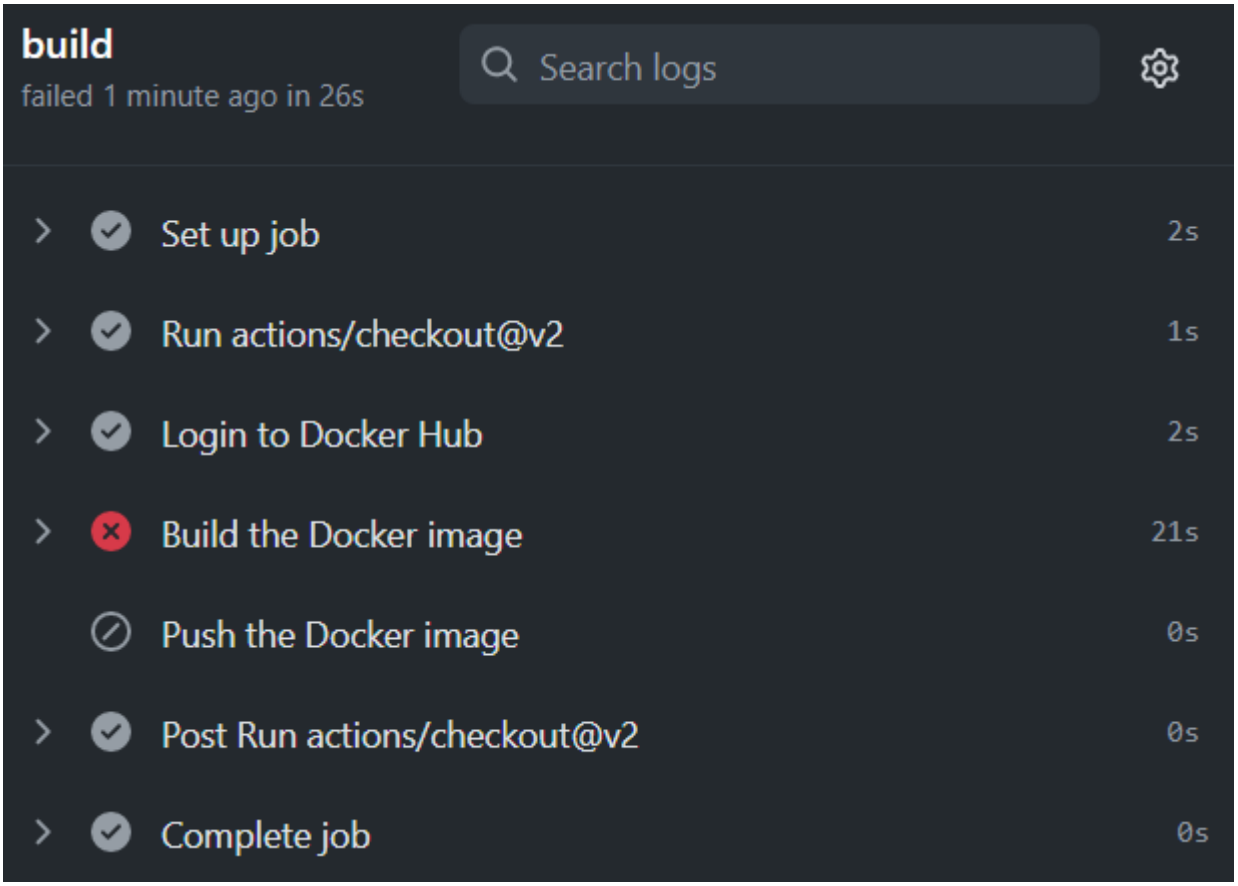
## Tags and Scans

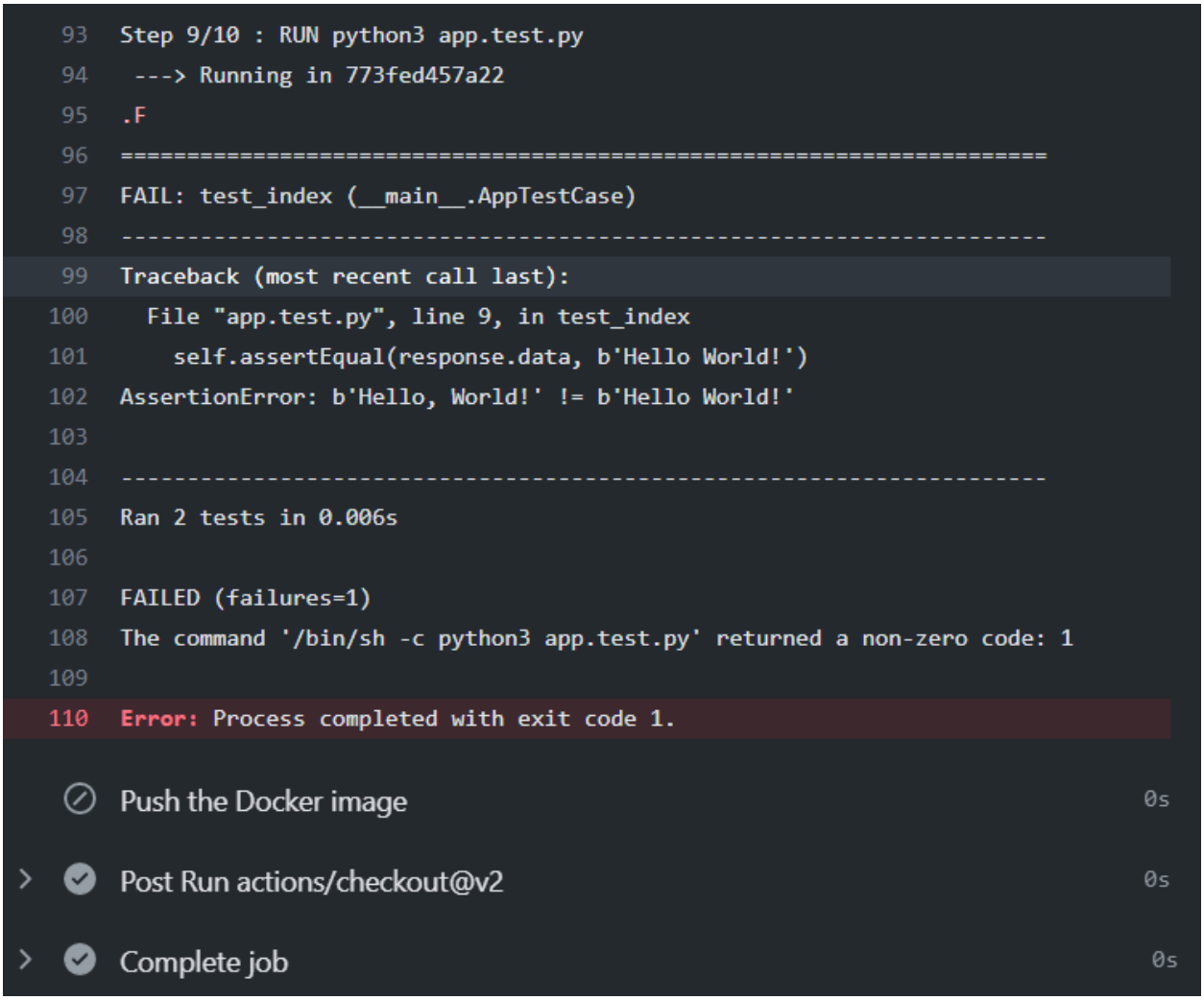
VULNERABILITY SCANNING - **DISABLED**
Enable

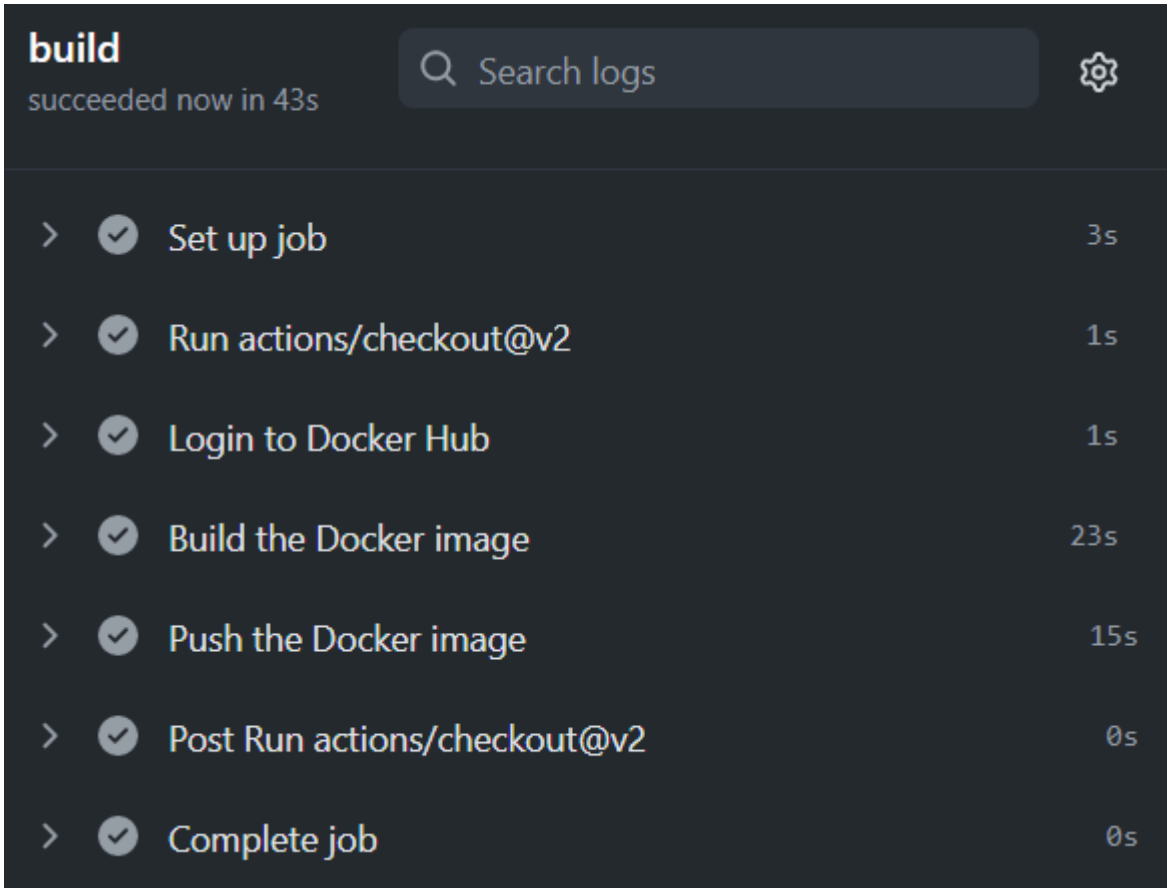
This repository contains 1 tag(s).

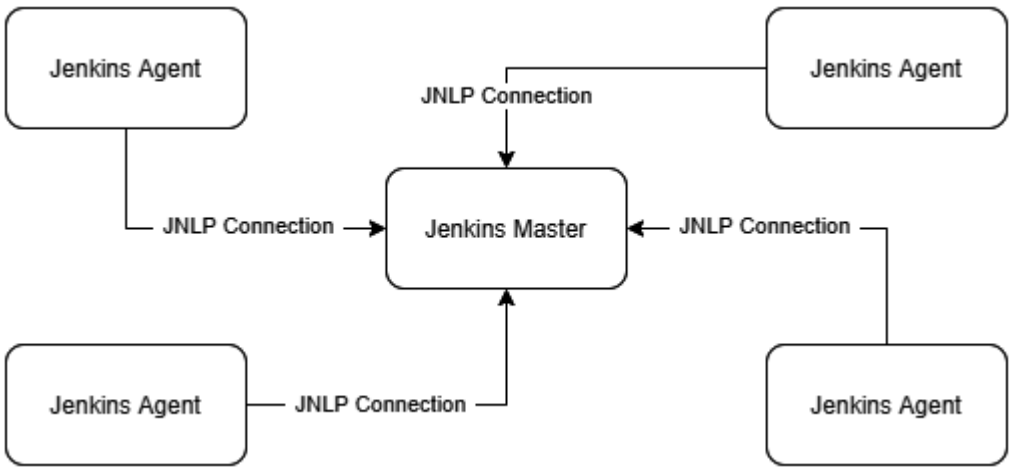
| TAG | OS | PULLED | PUSHED |
|---|---|---|---|
| latest |  | 4 minutes ago | 4 minutes ago |

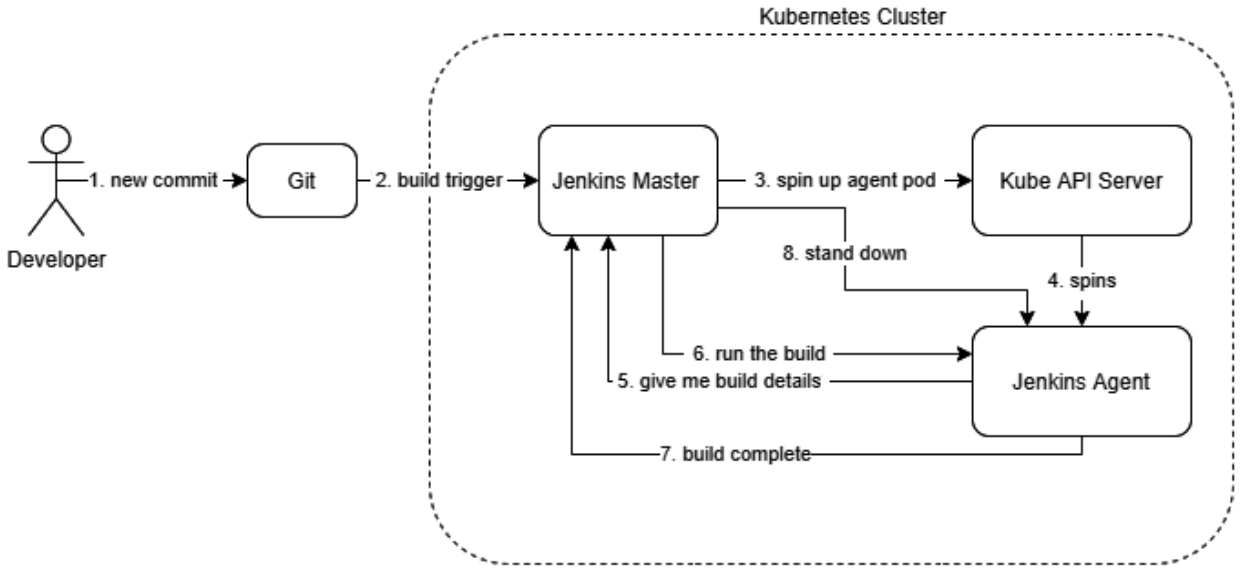
See all

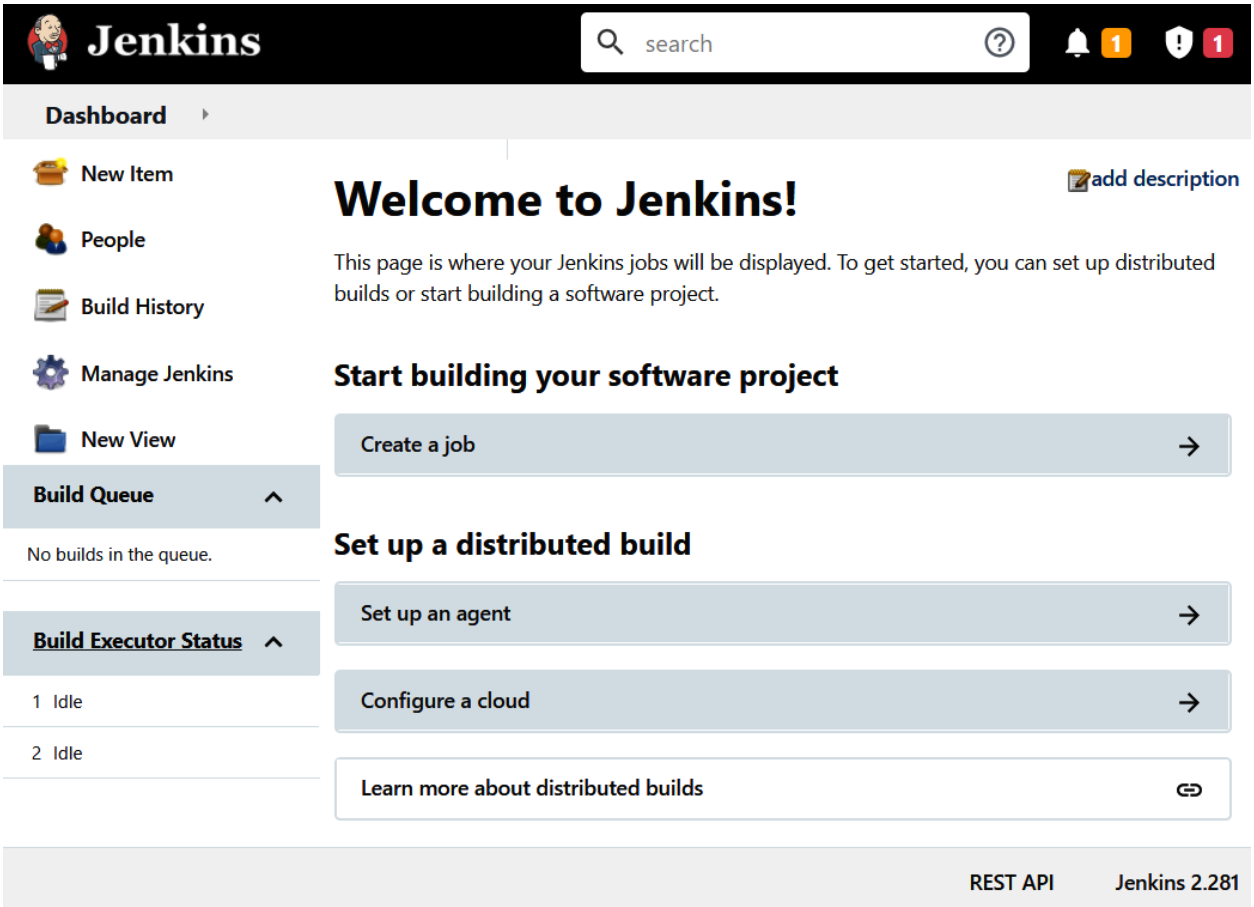

build
failed 1 minute ago in 26s
Search logs
Set up job
2s
Run actions/checkout@v2
1s
Login to Docker Hub
2s
Build the Docker image
21s
Push the Docker image
0s
Post Run actions/checkout@v2
0s
Complete job
0s


93 Step 9/10 : RUN python3 app.test.py
94 ---> Running in 773fed457a22
95 .F
96 ======================================================================
97 FAIL: test_index (__main__.AppTestCase)
98 ----------------------------------------------------------------------
99 Traceback (most recent call last):
100 File "app.test.py", line 9, in test_index
101 self.assertEqual(response.data, b'Hello World!')
102 AssertionError: b'Hello, World!' != b'Hello World!'
103
104 ----------------------------------------------------------------------
105 Ran 2 tests in 0.006s
106
107 FAILED (failures=1)
108 The command '/bin/sh -c python3 app.test.py' returned a non-zero code: 1
109
110 Error: Process completed with exit code 1.
Push the Docker image 0s
Post Run actions/checkout@v2 0s
Complete job 0s


build
succeeded now in 43s
Search logs
Set up job
3s
Run actions/checkout@v2
1s
Login to Docker Hub
1s
Build the Docker image
23s
Push the Docker image
15s
Post Run actions/checkout@v2
0s
Complete job
0s


Jenkins Agent
Jenkins Agent
JNLP Connection
JNLP Connection
Jenkins Master
JNLP Connection
Jenkins Agent
JNLP Connection
Jenkins Agent


Kubernetes Cluster
Developer
1. new commit
Git
2. build trigger
Jenkins Master
3. spin up agent pod
Kube API Server
8. stand down
4. spins
6. run the build
5. give me build details
Jenkins Agent
7. build complete


Jenkins
search
1
1
Dashboard
New Item
People
Build History
Manage Jenkins
New View
Build Queue
No builds in the queue.
Build Executor Status
1 Idle
2 Idle
Welcome to Jenkins!
add description
This page is where your Jenkins jobs will be displayed. To get started, you can set up distributed builds or start building a software project.
Start building your software project
Create a job
Set up a distributed build
Set up an agent
Configure a cloud
Learn more about distributed builds
REST API
Jenkins 2.281

# Configure Global Security

## Authentication

- [ ] Disable remember me

## Security Realm

- ( ) Delegate to servlet container
- (•) Jenkins' own user database
  - [ ] Allow users to sign up
- ( ) None

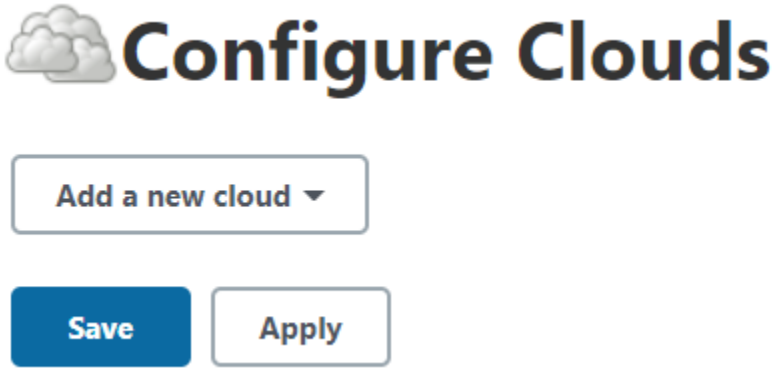
## Authorization

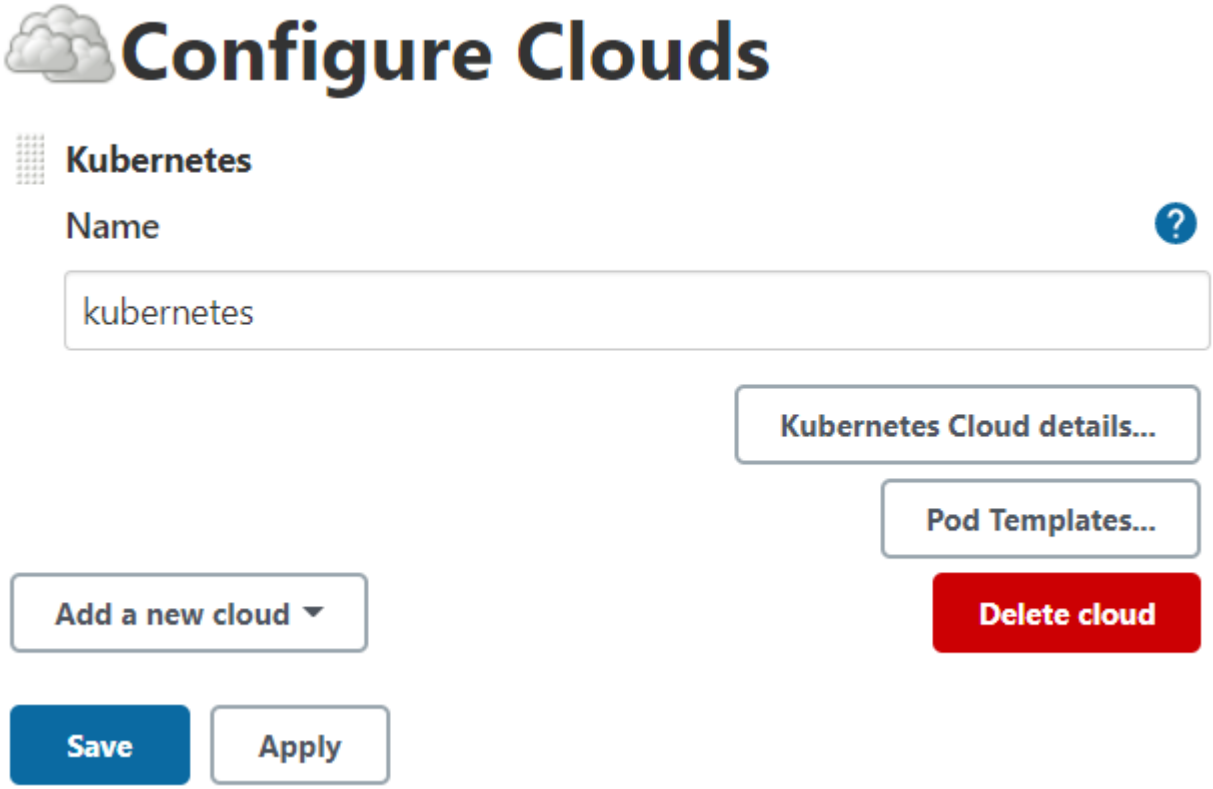
- ( ) Anyone can do anything
- ( ) Legacy mode
- (•) Logged-in users can do anything
  - [ ] Allow anonymous read access

## Markup Formatter

Markup Formatter

Save Apply


Configure Clouds
Add a new cloud
Save
Apply


Configure Clouds
Kubernetes
Name
kubernetes
Kubernetes Cloud details...
Pod Templates...
Add a new cloud
Delete cloud
Save
Apply

**Kubernetes**

**Name**

kubernetes

**Kubernetes URL**

https://35.224.6.58

☐ **Use Jenkins Proxy**

**Kubernetes server certificate key**

☐ **Disable https certificate check**

**Kubernetes Namespace**

**Credentials**

- none - | **Add**

Connected to Kubernetes v1.18.12-gke.1210

**Test Connection**

**Jenkins URL**

https://jenkins-service:8080

**Jenkins tunnel**

jenkins-service:50000

**Connection Timeout**

5

**Read Timeout**

15

**Concurrency Limit**

10

**Pod Labels**

**Pod Label**

**Key**

jenkins

**Value**

agent

## Pod Templates

Pod Template

**Name**

jenkins-agent

**Namespace**

**Labels**

jenkins-agent

**Usage**

Use this node as much as possible

**Pod template to inherit from**

**Containers**

Add Container

List of container in the agent pod

**Environment variables**

Add Environment Variable

## Container Template

**Name**

jnlp

**Docker image**

bharamicrosystems/jenkins-jnlp-kaniko

☐ **Always pull image**

**Working directory**

/home/jenkins/agent

**Command to run**

**Arguments to pass to the command**

☐ **Allocate pseudo-TTY**

**Environment Variables**

**Add Environment Variable**

List of environment variables to set in agent pod

**Save** **Apply**

Volumes

**Secret Volume**

Secret name

regcred

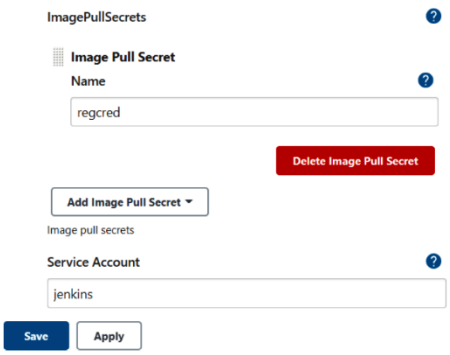
Mount path

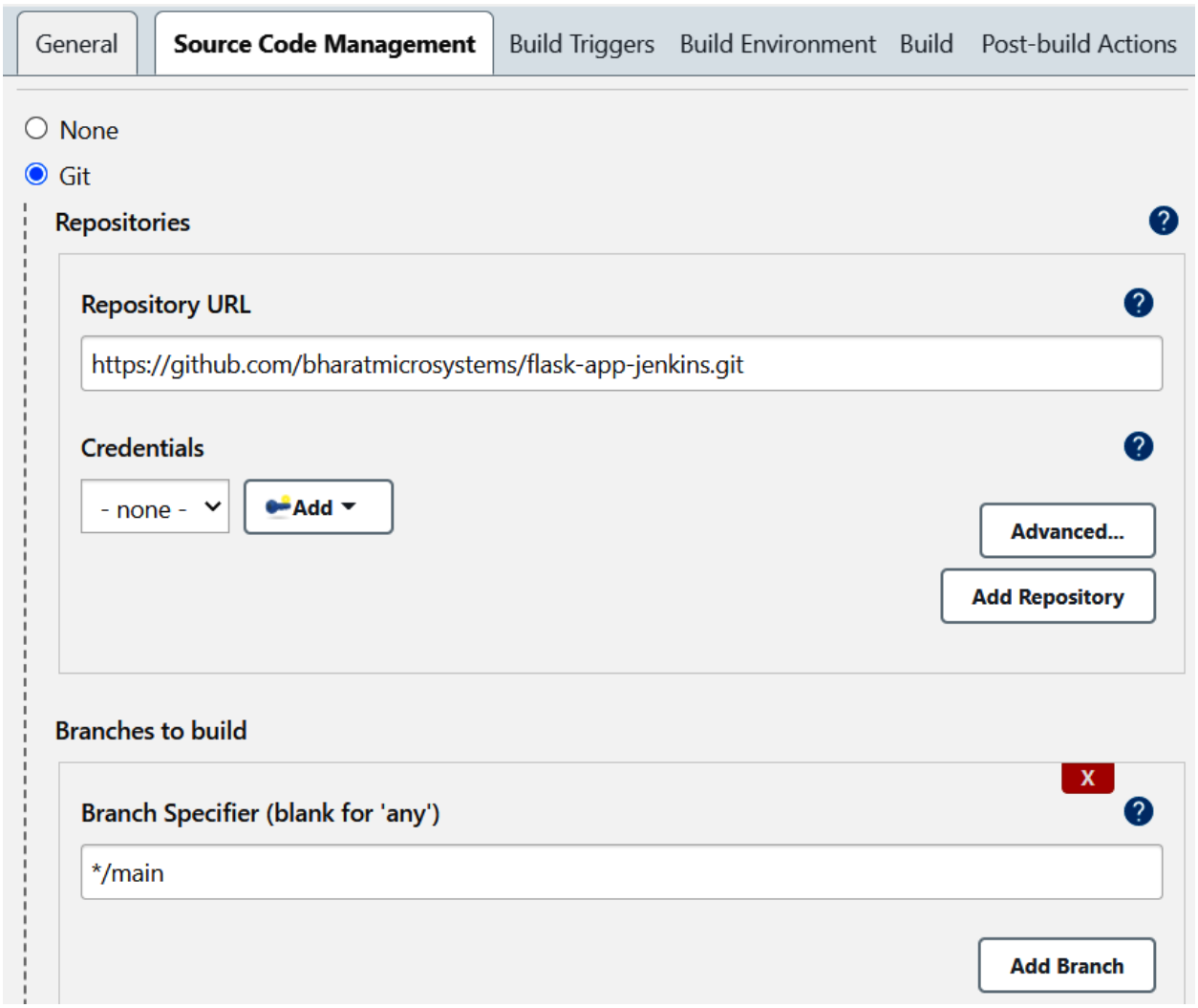
/kaniko/.docker

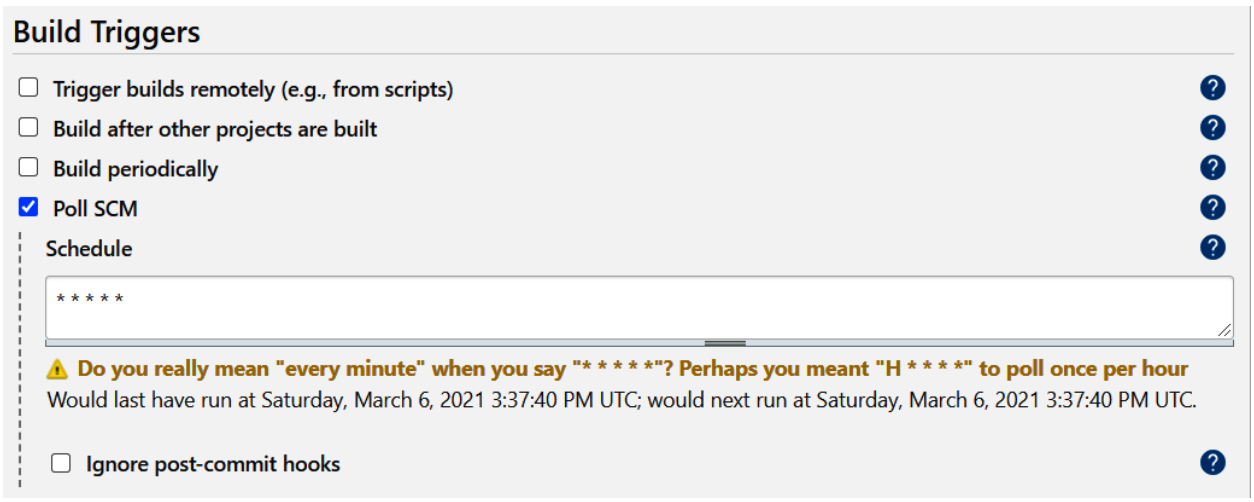
Default mode

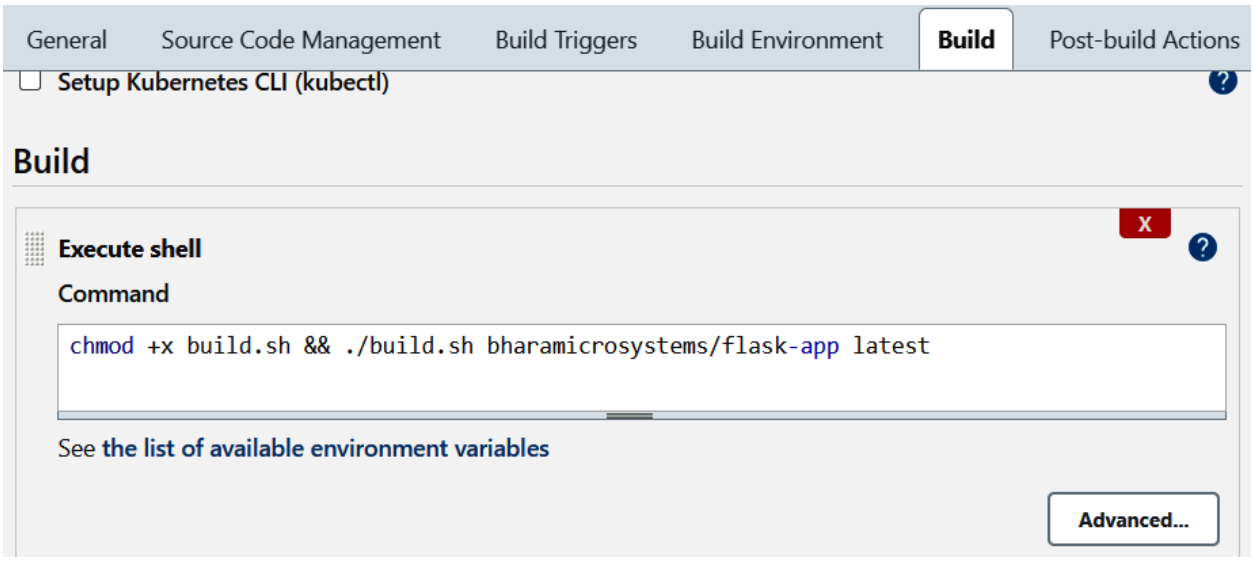
Optional

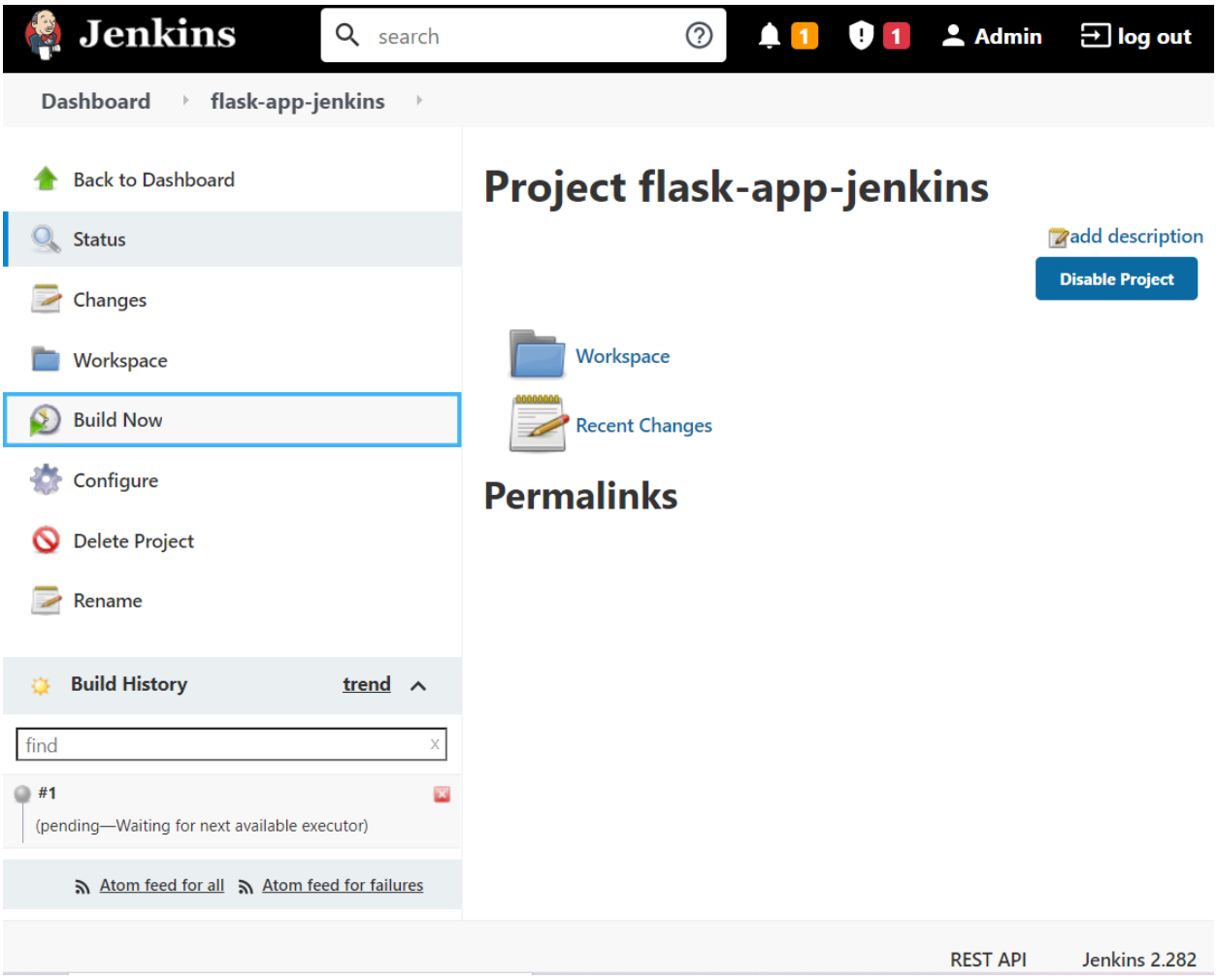
**Delete Volume**




General
Source Code Management
Build Triggers
Build Environment
Build
Post-build Actions
None
Git
Repositories
Repository URL
https://github.com/bharatmicrosystems/flask-app-jenkins.git
Credentials
- none -
Add
Advanced...
Add Repository
Branches to build
Branch Specifier (blank for 'any')
*/main
Add Branch

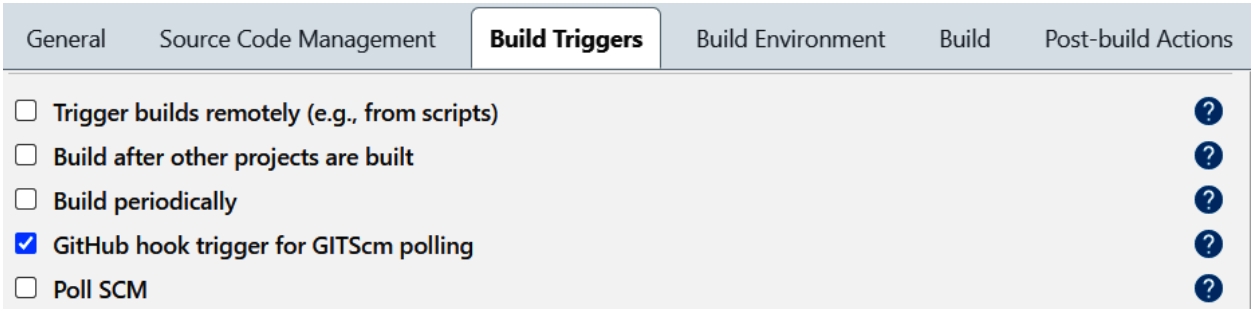

Build Triggers
Trigger builds remotely (e.g., from scripts)
Build after other projects are built
Build periodically
Poll SCM
Schedule
* * * * *
Do you really mean "every minute" when you say "* * * * *"? Perhaps you meant "H * * * *" to poll once per hour
Would last have run at Saturday, March 6, 2021 3:37:40 PM UTC; would next run at Saturday, March 6, 2021 3:37:40 PM UTC.
Ignore post-commit hooks


General
Source Code Management
Build Triggers
Build Environment
Build
Post-build Actions
Setup Kubernetes CLI (kubectl)
Build
Execute shell
Command
chmod +x build.sh && ./build.sh bharamicrosystems/flask-app latest
See the list of available environment variables
Advanced...


Jenkins
search
1
1
Admin
log out
Dashboard
flask-app-jenkins
Back to Dashboard
Status
Changes
Workspace
Build Now
Configure
Delete Project
Rename
Build History
trend
find
#1
(pending—Waiting for next available executor)
Atom feed for all
Atom feed for failures
Project flask-app-jenkins
add description
Disable Project
Workspace
Recent Changes
Permalinks
REST API
Jenkins 2.282

```
Collecting Werkzeug>=0.15
  Downloading Werkzeug-1.0.1-py2.py3-none-any.whl (298 kB)
Collecting click>=5.1
  Downloading click-7.1.2-py2.py3-none-any.whl (82 kB)
Collecting MarkupSafe>=0.23
  Downloading MarkupSafe-1.1.1.tar.gz (19 kB)
Building wheels for collected packages: MarkupSafe
  Building wheel for MarkupSafe (setup.py): started
  Building wheel for MarkupSafe (setup.py): finished with status 'done'
  Created wheel for MarkupSafe: filename=MarkupSafe-1.1.1-cp37-cp37m-linux_x86_64.whl size=17026
sha256=ed65c6a2b98932cf4c3f02c3359d80d24f71a17debb91eb52832331c4419cdee
  Stored in directory: /root/.cache/pip/wheels/b9/d9/ae/63bf9056b0a22b13ade9f6b9e08187c1bb71c47ef21a8c9924
Successfully built MarkupSafe
Installing collected packages: MarkupSafe, Werkzeug, Jinja2, itsdangerous, click, flask
Successfully installed Jinja2-2.11.3 MarkupSafe-1.1.1 Werkzeug-1.0.1 click-7.1.2 flask-1.1.2 itsdangerous-1.1.0
[36mINFO[0m[0028] Taking snapshot of full filesystem...
[36mINFO[0m[0033] EXPOSE 5000
[36mINFO[0m[0033] cmd: EXPOSE
[36mINFO[0m[0033] Adding exposed port: 5000/tcp
[36mINFO[0m[0033] Using files from context: [/home/jenkins/agent/workspace/flask-app-jenkins]
[36mINFO[0m[0033] COPY . .
[36mINFO[0m[0033] Taking snapshot of files...
[36mINFO[0m[0033] RUN python3 app.test.py
[36mINFO[0m[0033] cmd: /bin/sh
[36mINFO[0m[0033] args: [-c python3 app.test.py]
..
----------------------------------------------------------------------
Ran 2 tests in 0.009s

OK
[36mINFO[0m[0033] Taking snapshot of full filesystem...
[36mINFO[0m[0037] CMD ["flask", "run"]
Finished: SUCCESS
```



Webhooks / **Manage webhook**

We'll send a `POST` request to the URL below with details of any subscribed events. You can also specify which data format you'd like to receive (JSON, `x-www-form-urlencoded`, *etc*). More information can be found in our developer documentation.

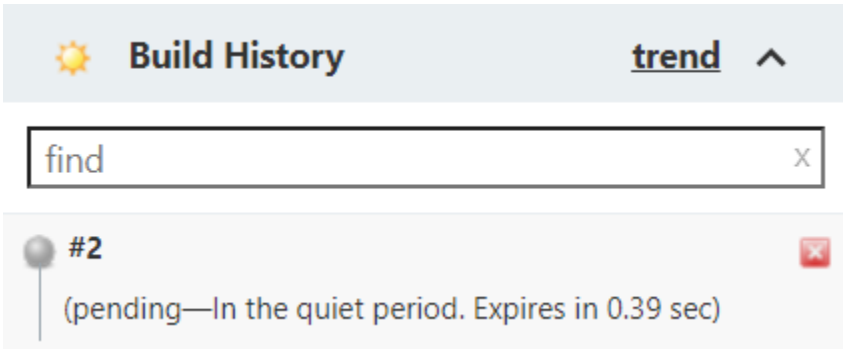
**Payload URL** *

http://[YOUR_JENKINS_IP]:8080/github-webhook/

**Content type**

application/json

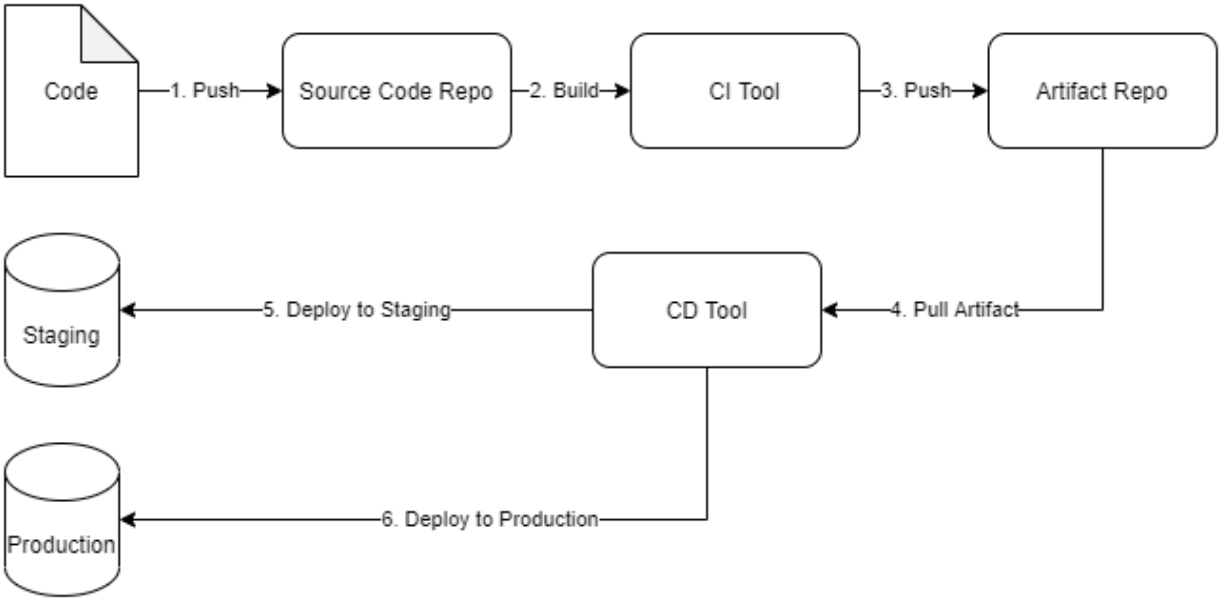
**Secret**

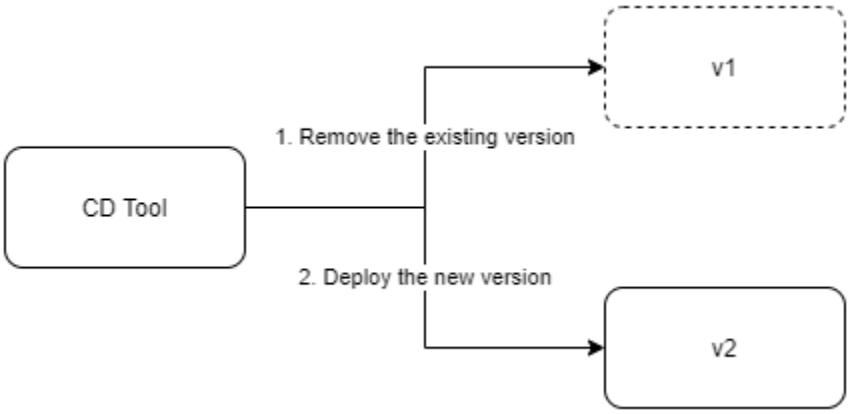


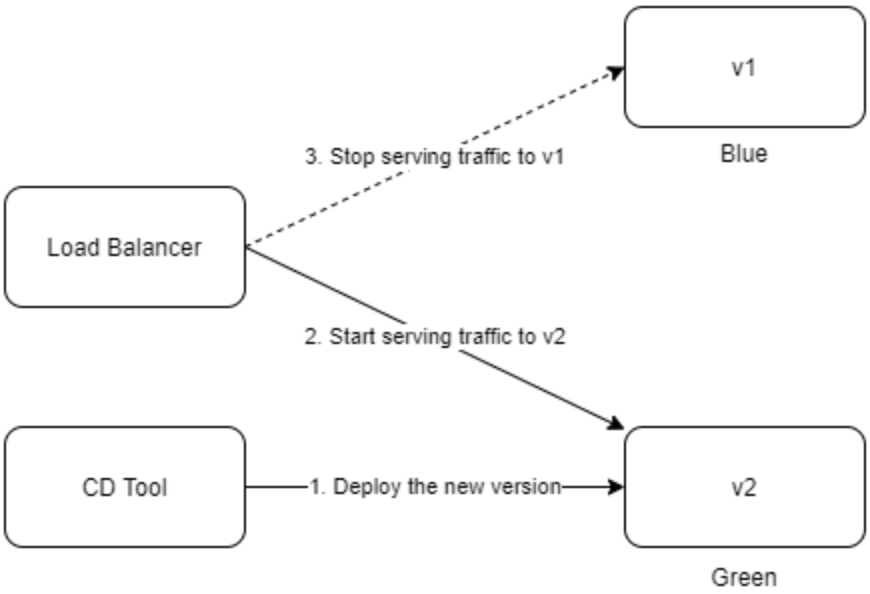
Succeeded Start time: 1 minute ago

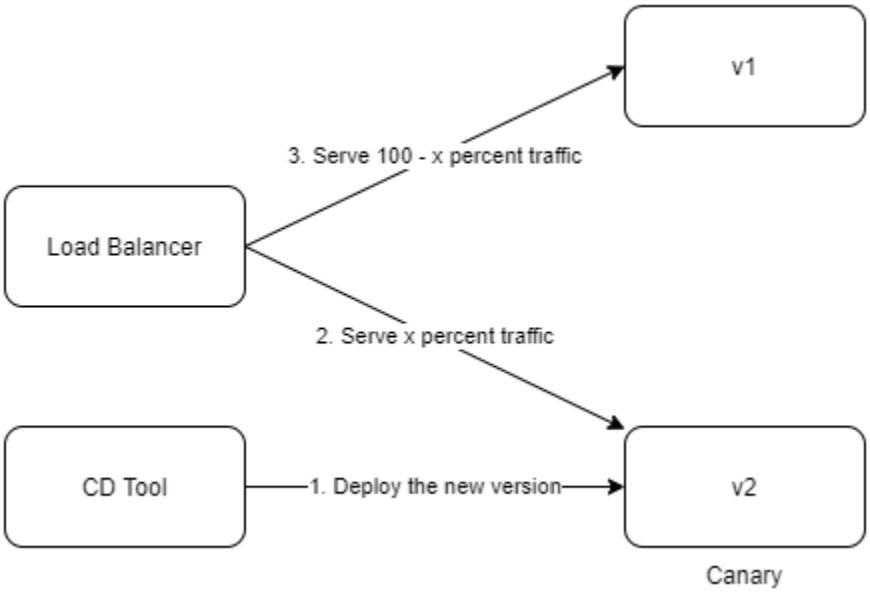
```
125 Step 9/10 : RUN python3 app.test.py
126  ---> Running in 8d1d4ba68db0
127 ..
128 ----------------------------------------------------------------------
129 Ran 2 tests in 0.005s
130
131 OK
132 Removing intermediate container 8d1d4ba68db0
133  ---> b40419bc02e2
134 Step 10/10 : CMD ["flask", "run"]
135  ---> Running in fcd19fa41266
136 Removing intermediate container fcd19fa41266
137  ---> 546f49191db4
138 Successfully built 546f49191db4
139 Successfully tagged bharamicrosystems/flask-app:latest
140
141 [Container] 2021/03/07 16:01:46 Phase complete: BUILD State: SUCCEEDED
142 [Container] 2021/03/07 16:01:46 Phase context status code:  Message:
143 [Container] 2021/03/07 16:01:46 Entering phase POST_BUILD
144 [Container] 2021/03/07 16:01:46 Running command docker push bharamicrosystems/flask-app
145 The push refers to repository [docker.io/bharamicrosystems/flask-app]
146 ac2cfe9ff0f1: Preparing
147 76429a61e3d3: Preparing
```

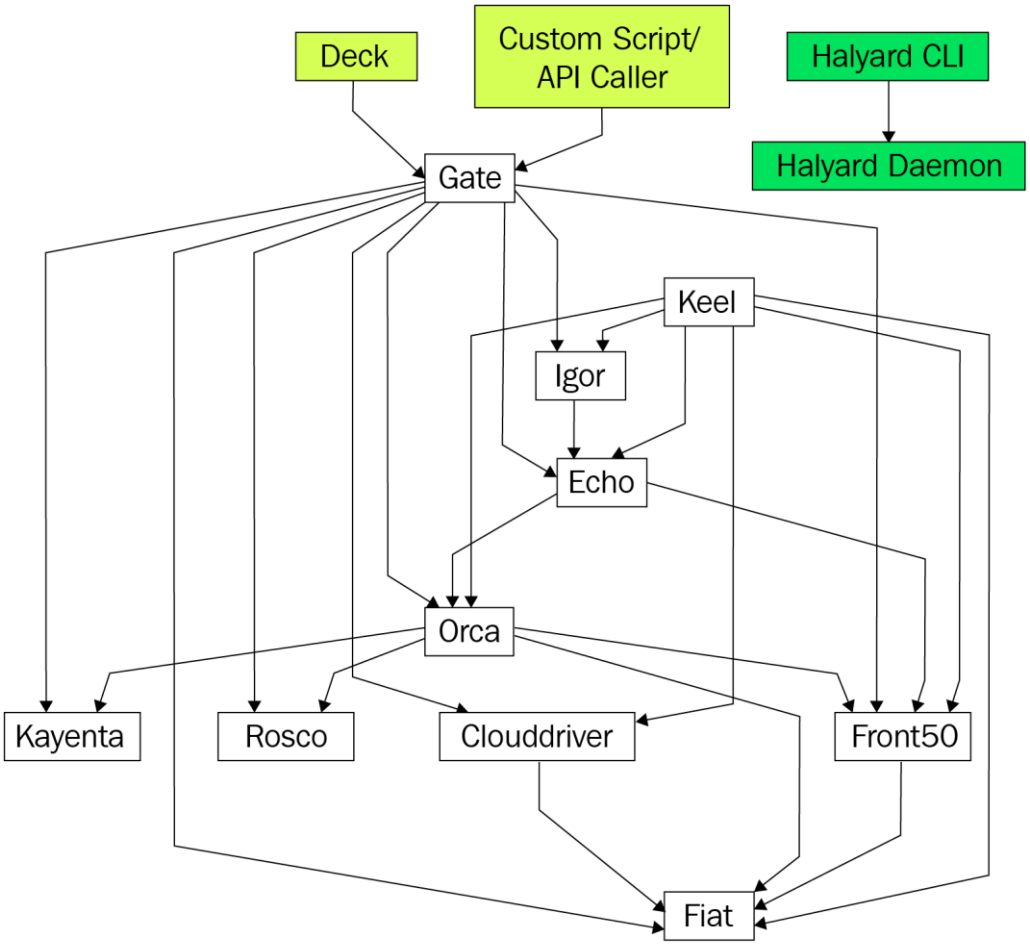
# Chapter 11: Continuous Deployment/Delivery with Spinnaker

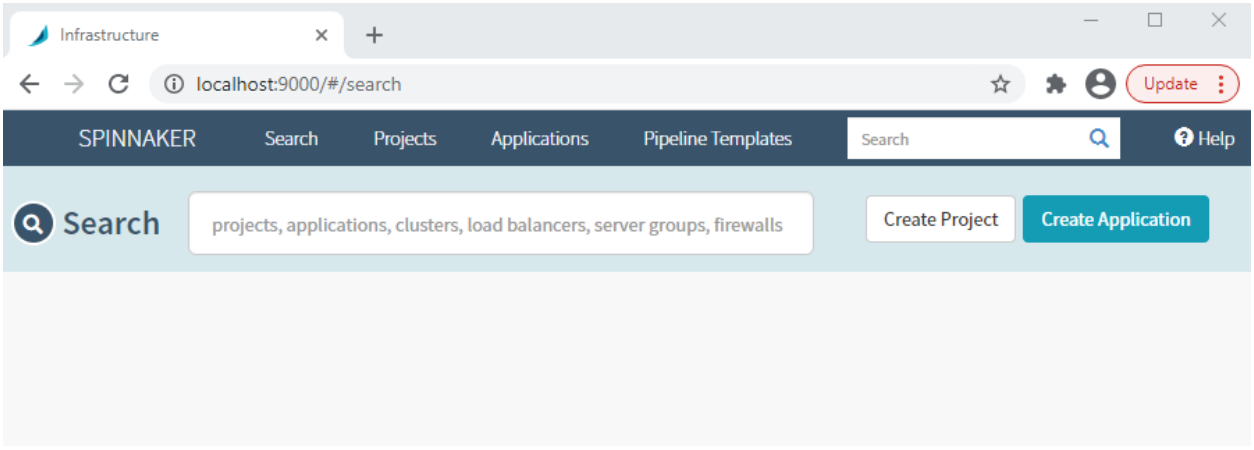


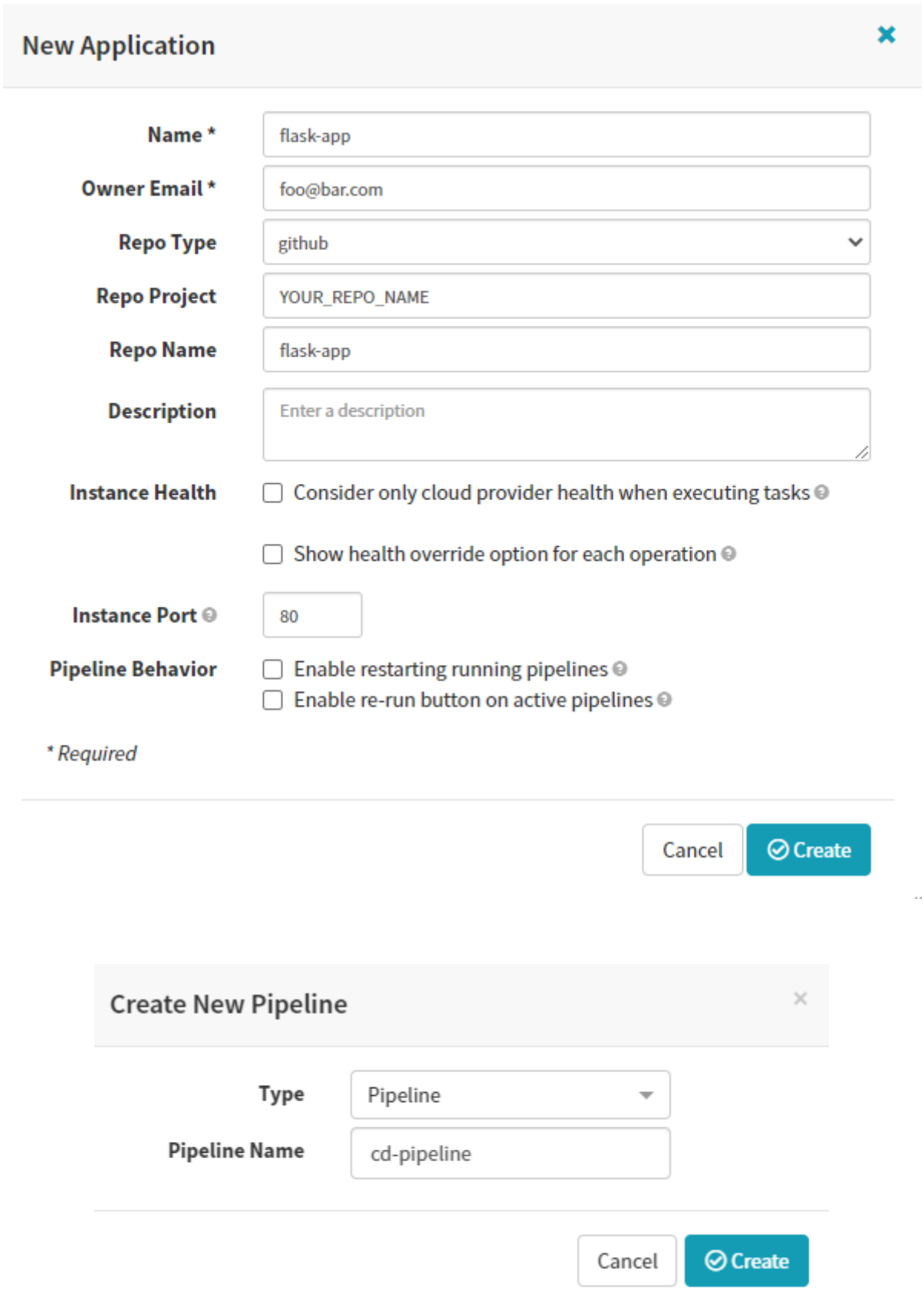



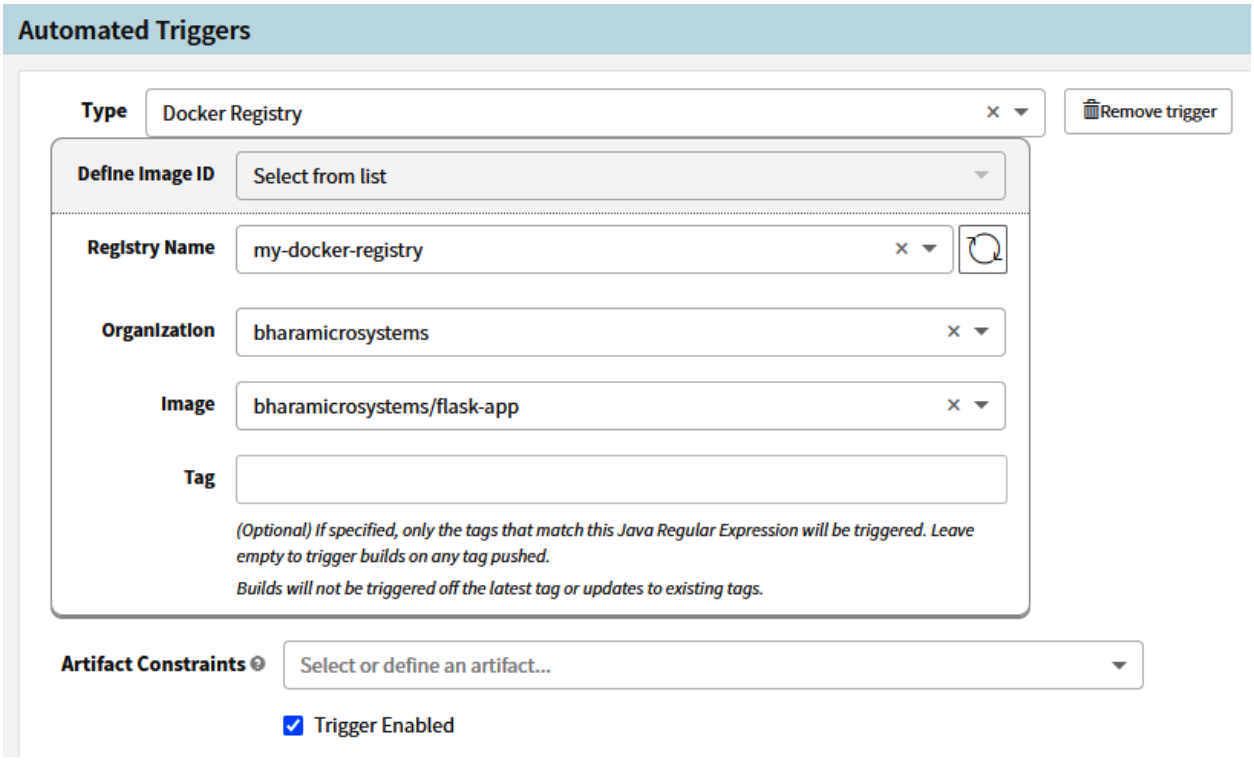

v1
Blue
3. Stop serving traffic to v1
Load Balancer
2. Start serving traffic to v2
CD Tool
1. Deploy the new version
v2
Green

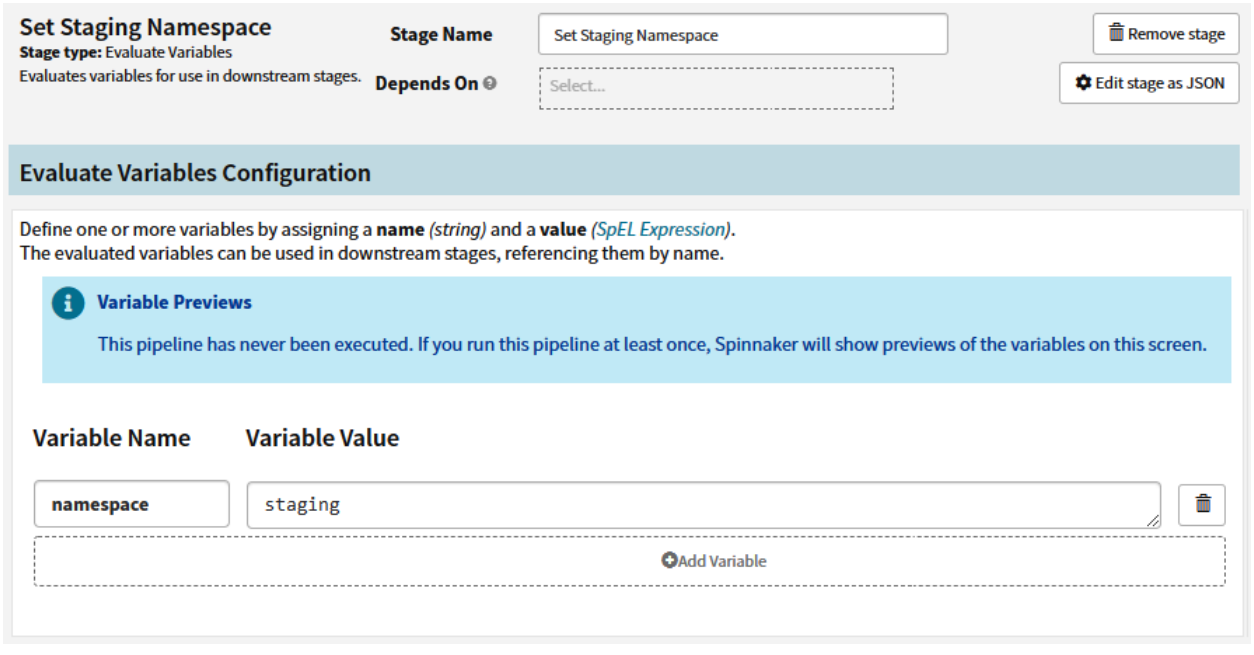

v1
3. Serve 100 - x percent traffic
Load Balancer
2. Serve x percent traffic
CD Tool
1. Deploy the new version
v2
Canary

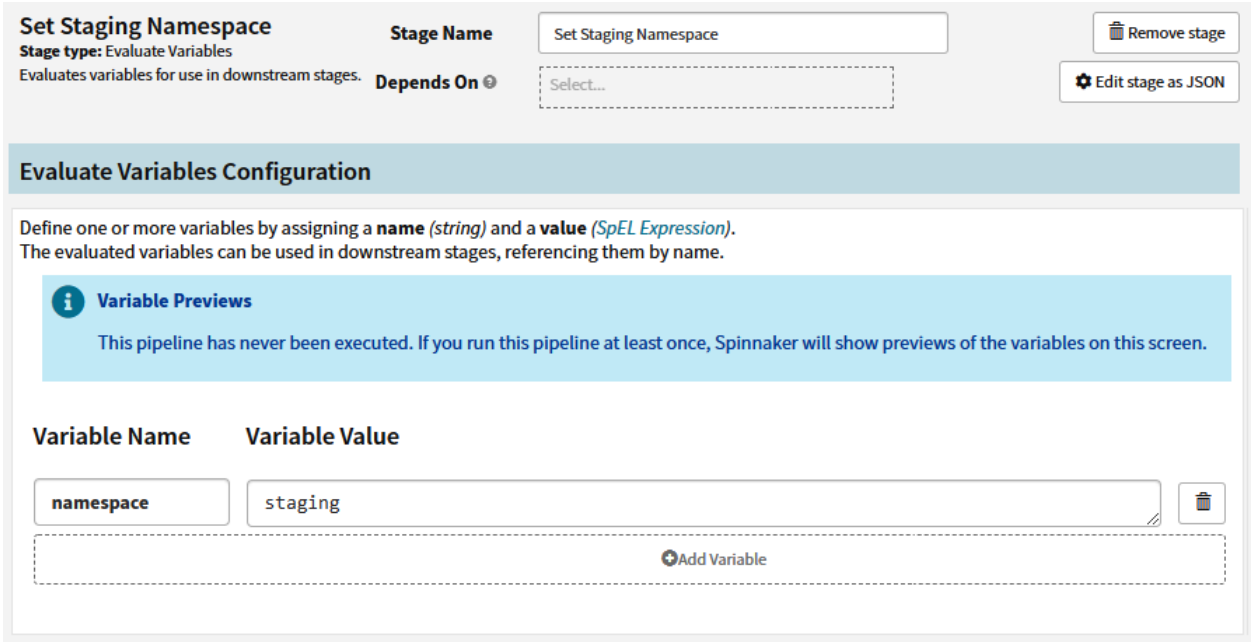

Deck
Custom Script/
API Caller
Halyard CLI
Halyard Daemon
Gate
Keel
Igor
Echo
Orca
Kayenta
Rosco
Clouddriver
Front50
Fiat

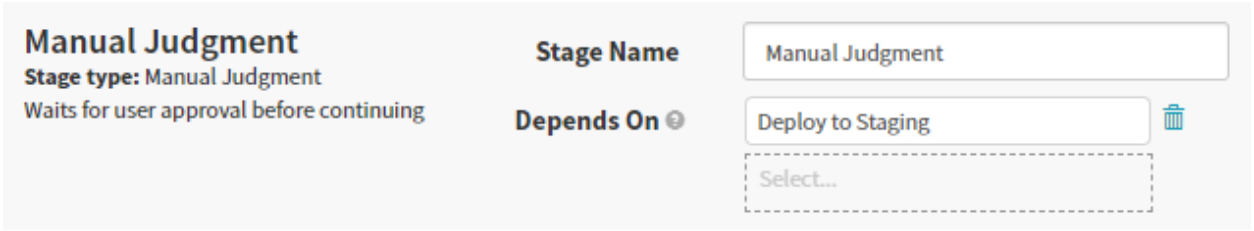

Infrastructure
localhost:9000/#/search
Update
SPINNAKER
Search
Projects
Applications
Pipeline Templates
Search
Help
Search
projects, applications, clusters, load balancers, server groups, firewalls
Create Project
Create Application

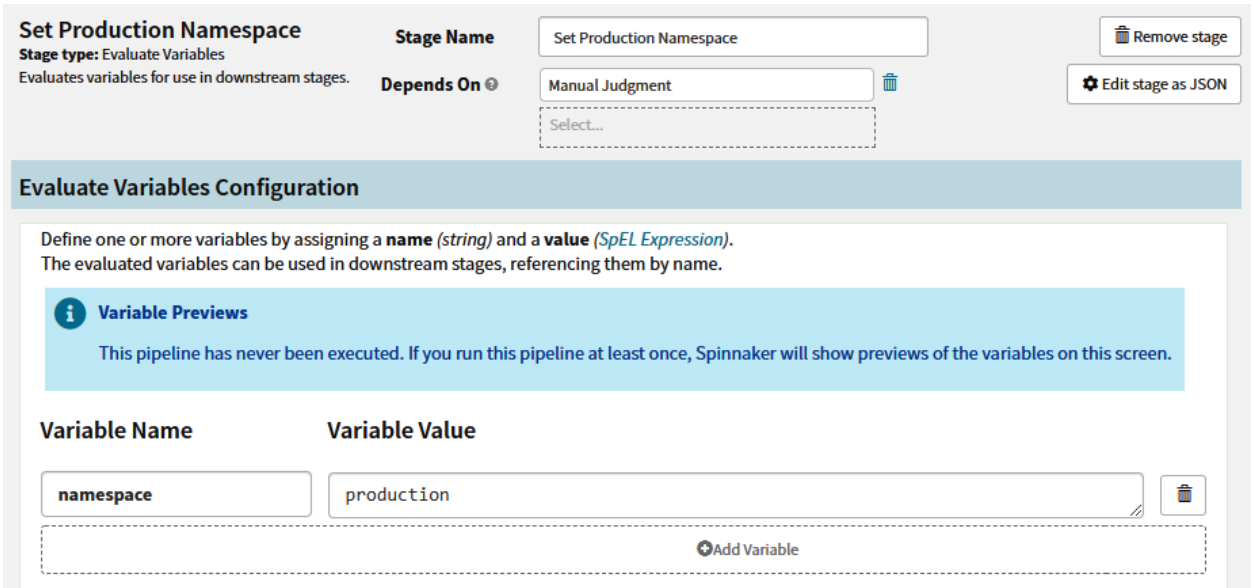

New Application
Name *
flask-app
Owner Email *
foo@bar.com
Repo Type
github
Repo Project
YOUR_REPO_NAME
Repo Name
flask-app
Description
Enter a description
Instance Health
Consider only cloud provider health when executing tasks
Show health override option for each operation
Instance Port
80
Pipeline Behavior
Enable restarting running pipelines
Enable re-run button on active pipelines
* Required
Cancel
Create
Create New Pipeline
Type
Pipeline
Pipeline Name
cd-pipeline
Cancel
Create

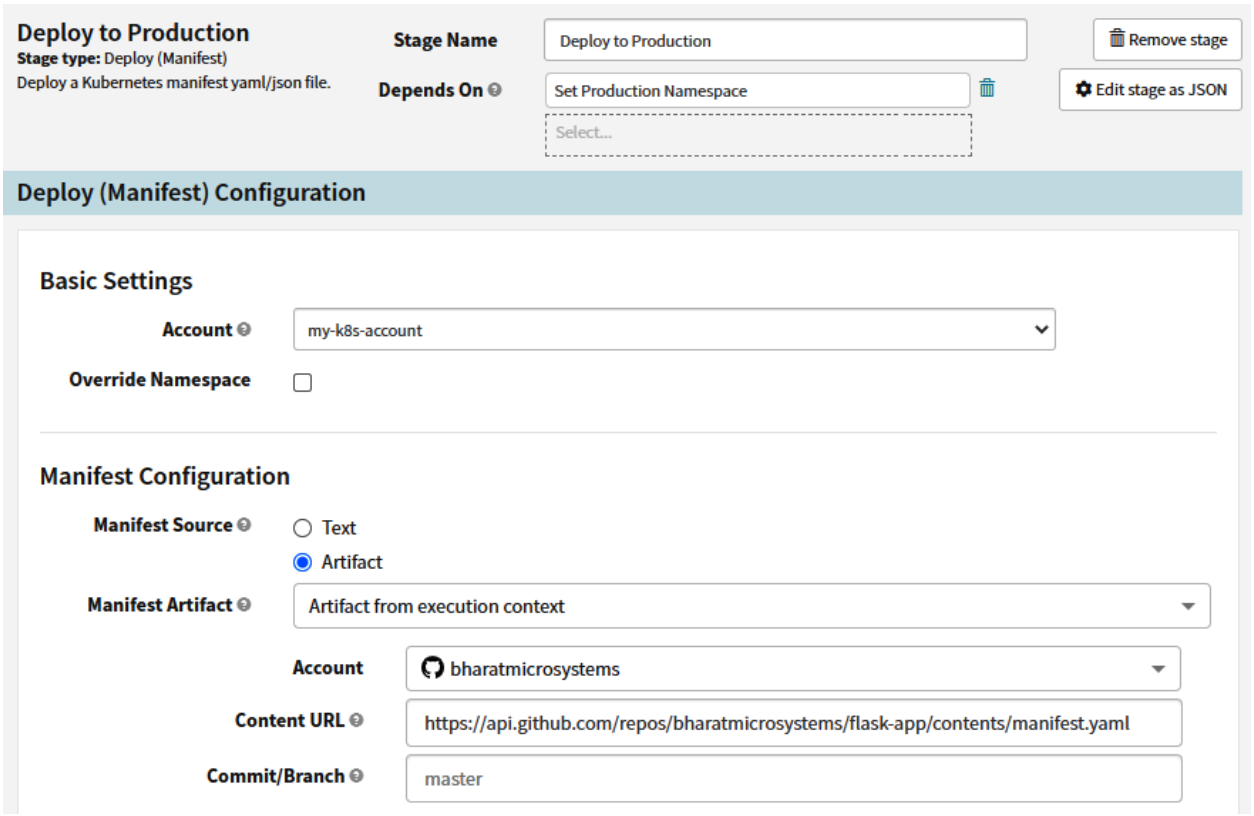

Automated Triggers
Type
Docker Registry
Remove trigger
Define Image ID
Select from list
Registry Name
my-docker-registry
Organization
bharamicrosystems
Image
bharamicrosystems/flask-app
Tag
(Optional) If specified, only the tags that match this Java Regular Expression will be triggered. Leave empty to trigger builds on any tag pushed.
Builds will not be triggered off the latest tag or updates to existing tags.
Artifact Constraints
Select or define an artifact...
Trigger Enabled

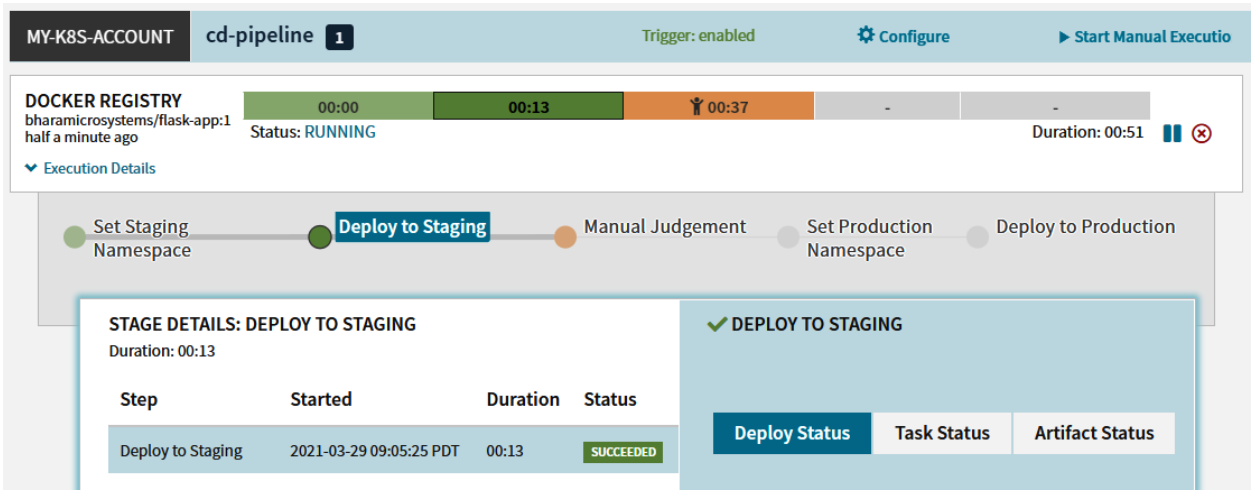

Set Staging Namespace
Stage type: Evaluate Variables
Evaluates variables for use in downstream stages.
Stage Name
Set Staging Namespace
Depends On
Select...
Remove stage
Edit stage as JSON
Evaluate Variables Configuration
Define one or more variables by assigning a name (string) and a value (SpEL Expression).
The evaluated variables can be used in downstream stages, referencing them by name.
Variable Previews
This pipeline has never been executed. If you run this pipeline at least once, Spinnaker will show previews of the variables on this screen.
Variable Name
Variable Value
namespace
staging
Add Variable

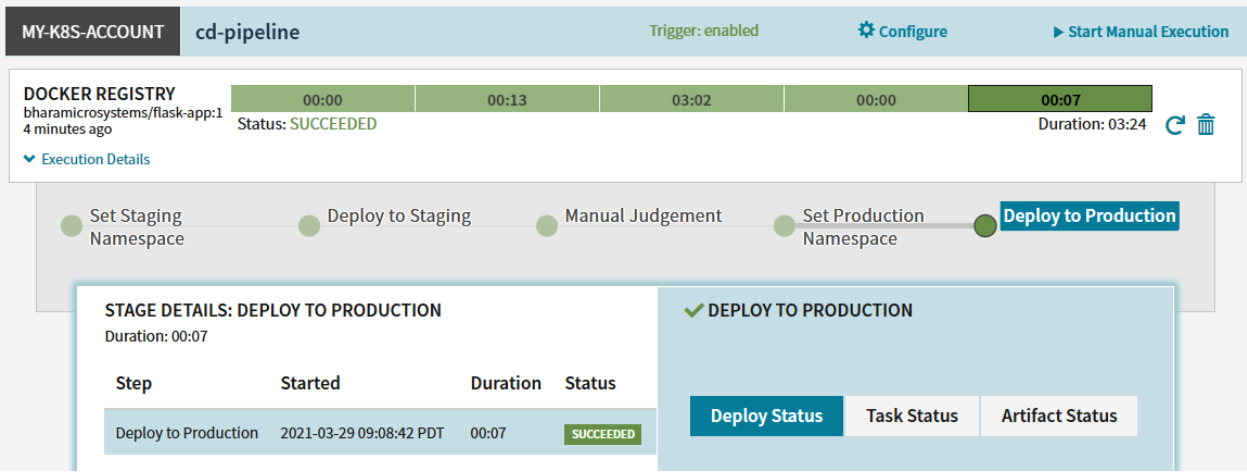

Set Staging Namespace
Stage type: Evaluate Variables
Evaluates variables for use in downstream stages.
Stage Name
Set Staging Namespace
Depends On
Select...
Remove stage
Edit stage as JSON
Evaluate Variables Configuration
Define one or more variables by assigning a name (string) and a value (SpEL Expression).
The evaluated variables can be used in downstream stages, referencing them by name.
Variable Previews
This pipeline has never been executed. If you run this pipeline at least once, Spinnaker will show previews of the variables on this screen.
Variable Name
Variable Value
namespace
staging
Add Variable

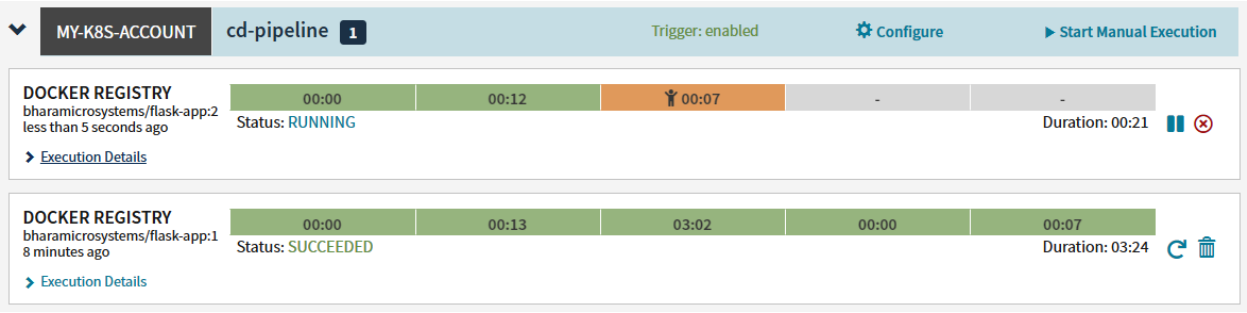

Manual Judgment
Stage type: Manual Judgment
Waits for user approval before continuing
Stage Name
Manual Judgment
Depends On
Deploy to Staging
Select...

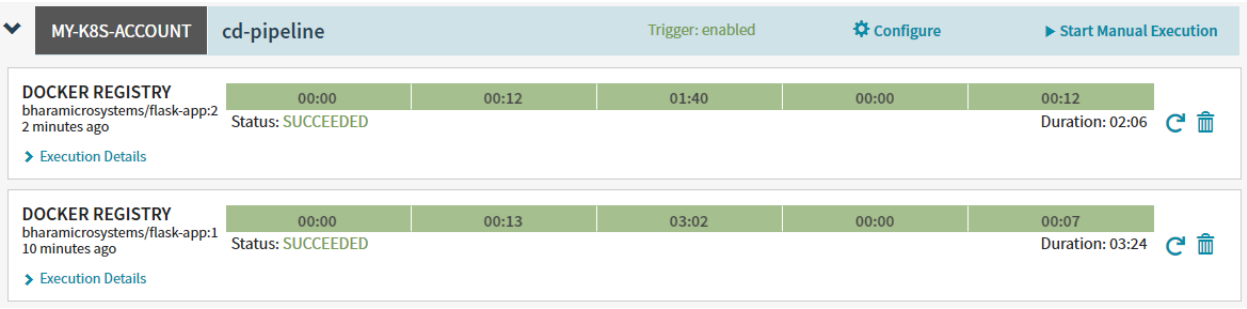

Set Production Namespace
Stage type: Evaluate Variables
Evaluates variables for use in downstream stages.
Stage Name
Set Production Namespace
Depends On
Manual Judgment
Select...
Remove stage
Edit stage as JSON
Evaluate Variables Configuration
Define one or more variables by assigning a name (string) and a value (SpEL Expression).
The evaluated variables can be used in downstream stages, referencing them by name.
Variable Previews
This pipeline has never been executed. If you run this pipeline at least once, Spinnaker will show previews of the variables on this screen.
Variable Name
Variable Value
namespace
production
Add Variable


Deploy to Production
Stage type: Deploy (Manifest)
Deploy a Kubernetes manifest yaml/json file.
Stage Name
Deploy to Production
Depends On
Set Production Namespace
Select...
Remove stage
Edit stage as JSON
Deploy (Manifest) Configuration
Basic Settings
Account
my-k8s-account
Override Namespace
Manifest Configuration
Manifest Source
Text
Artifact
Manifest Artifact
Artifact from execution context
Account
bharatmicrosystems
Content URL
https://api.github.com/repos/bharatmicrosystems/flask-app/contents/manifest.yaml
Commit/Branch
master

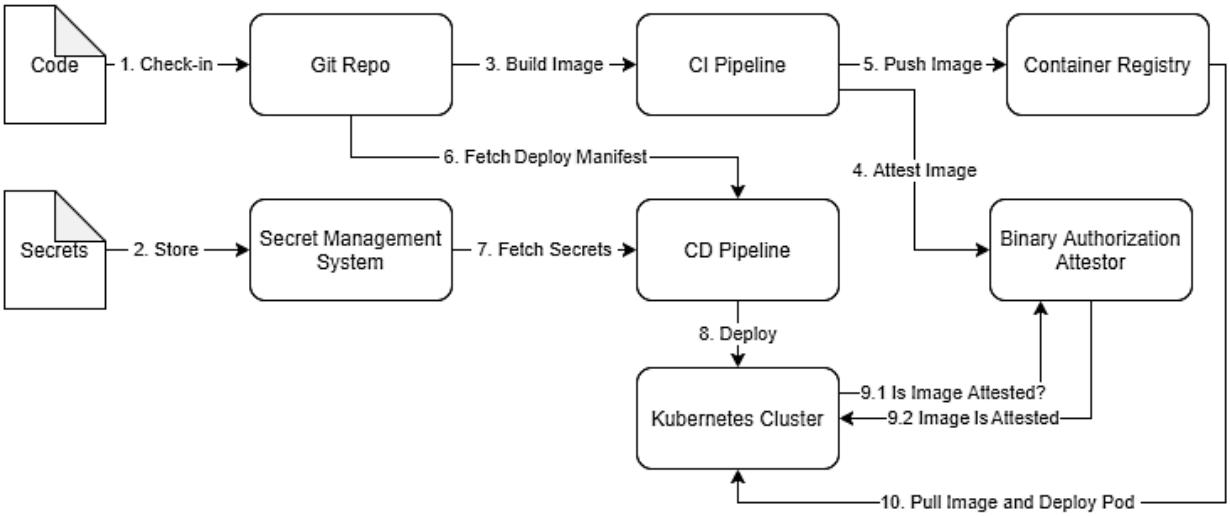

MY-K8S-ACCOUNT
cd-pipeline 1
Trigger: enabled
Configure
Start Manual Executio
DOCKER REGISTRY
bharamicrosystems/flask-app:1
half a minute ago
00:00
00:13
00:37
Status: RUNNING
Duration: 00:51
Execution Details
Set Staging Namespace
Deploy to Staging
Manual Judgement
Set Production Namespace
Deploy to Production
STAGE DETAILS: DEPLOY TO STAGING
Duration: 00:13
Step
Started
Duration
Status
Deploy to Staging
2021-03-29 09:05:25 PDT
00:13
SUCCEEDED
DEPLOY TO STAGING
Deploy Status
Task Status
Artifact Status


MY-K8S-ACCOUNT
cd-pipeline
Trigger: enabled
Configure
Start Manual Execution
DOCKER REGISTRY
bharamicrosystems/flask-app:1
4 minutes ago
00:00
00:13
03:02
00:00
00:07
Status: SUCCEEDED
Duration: 03:24
Execution Details
Set Staging Namespace
Deploy to Staging
Manual Judgement
Set Production Namespace
Deploy to Production
STAGE DETAILS: DEPLOY TO PRODUCTION
Duration: 00:07
Step
Started
Duration
Status
Deploy to Production
2021-03-29 09:08:42 PDT
00:07
SUCCEEDED
DEPLOY TO PRODUCTION
Deploy Status
Task Status
Artifact Status

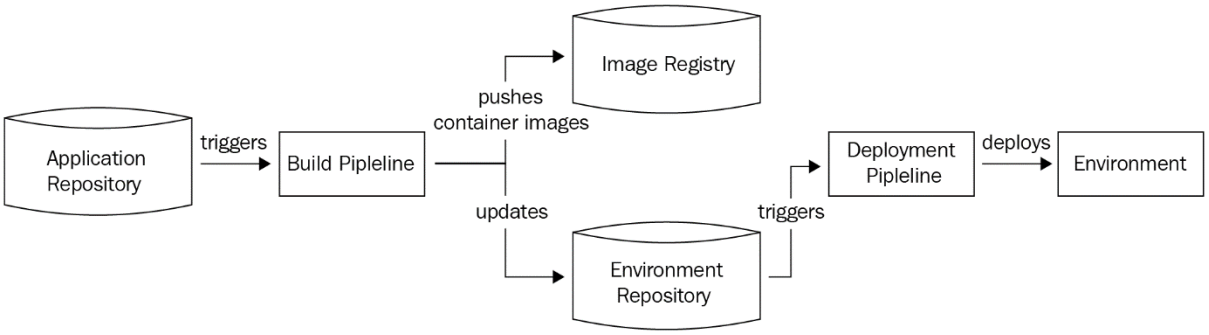

MY-K8S-ACCOUNT
cd-pipeline 1
Trigger: enabled
Configure
Start Manual Execution
DOCKER REGISTRY
bharamicrosystems/flask-app:2
less than 5 seconds ago
00:00
00:12
00:07
-
-
Status: RUNNING
Duration: 00:21
Execution Details
DOCKER REGISTRY
bharamicrosystems/flask-app:1
8 minutes ago
00:00
00:13
03:02
00:00
00:07
Status: SUCCEEDED
Duration: 03:24
Execution Details

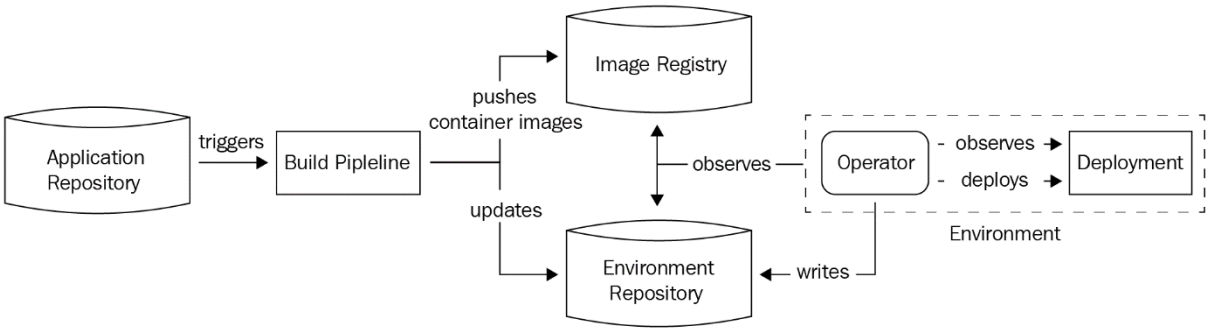

MY-K8S-ACCOUNT
cd-pipeline
Trigger: enabled
Configure
Start Manual Execution
DOCKER REGISTRY
bharamicrosystems/flask-app:2
2 minutes ago
00:00
00:12
01:40
00:00
00:12
Status: SUCCEEDED
Duration: 02:06
Execution Details
DOCKER REGISTRY
bharamicrosystems/flask-app:1
10 minutes ago
00:00
00:13
03:02
00:00
00:07
Status: SUCCEEDED
Duration: 03:24
Execution Details

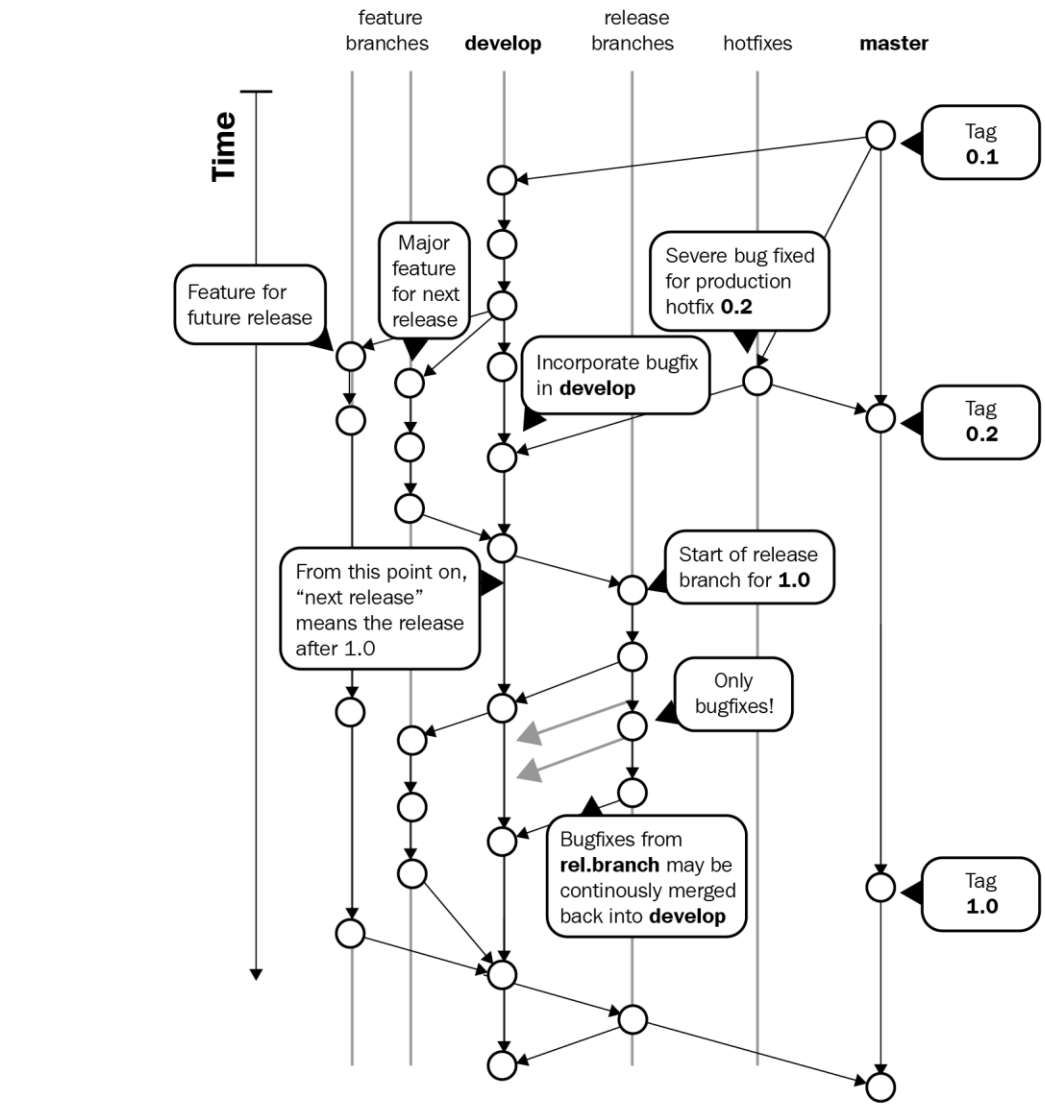
# Chapter 12: Securing the Deployment Pipeline

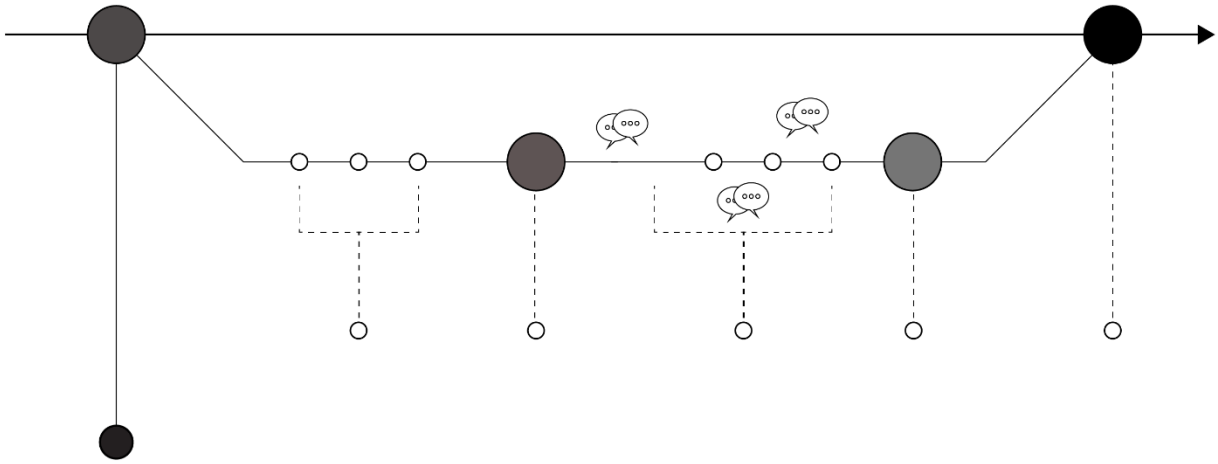


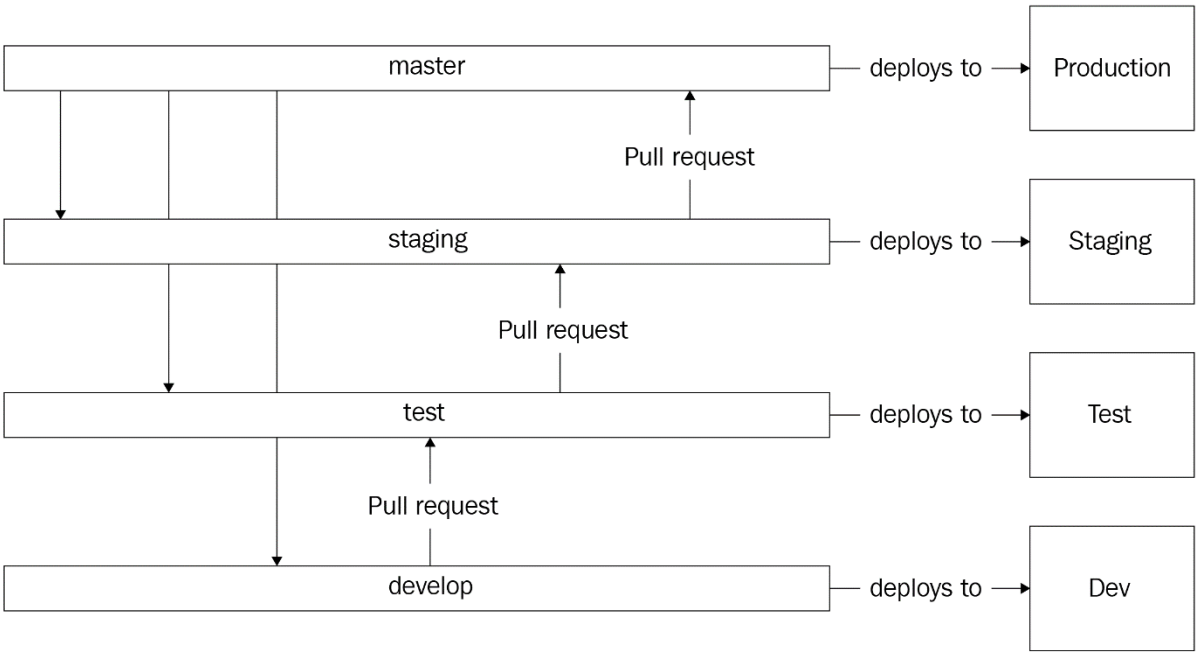
# Chapter 13: Understanding DevOps with GitOps

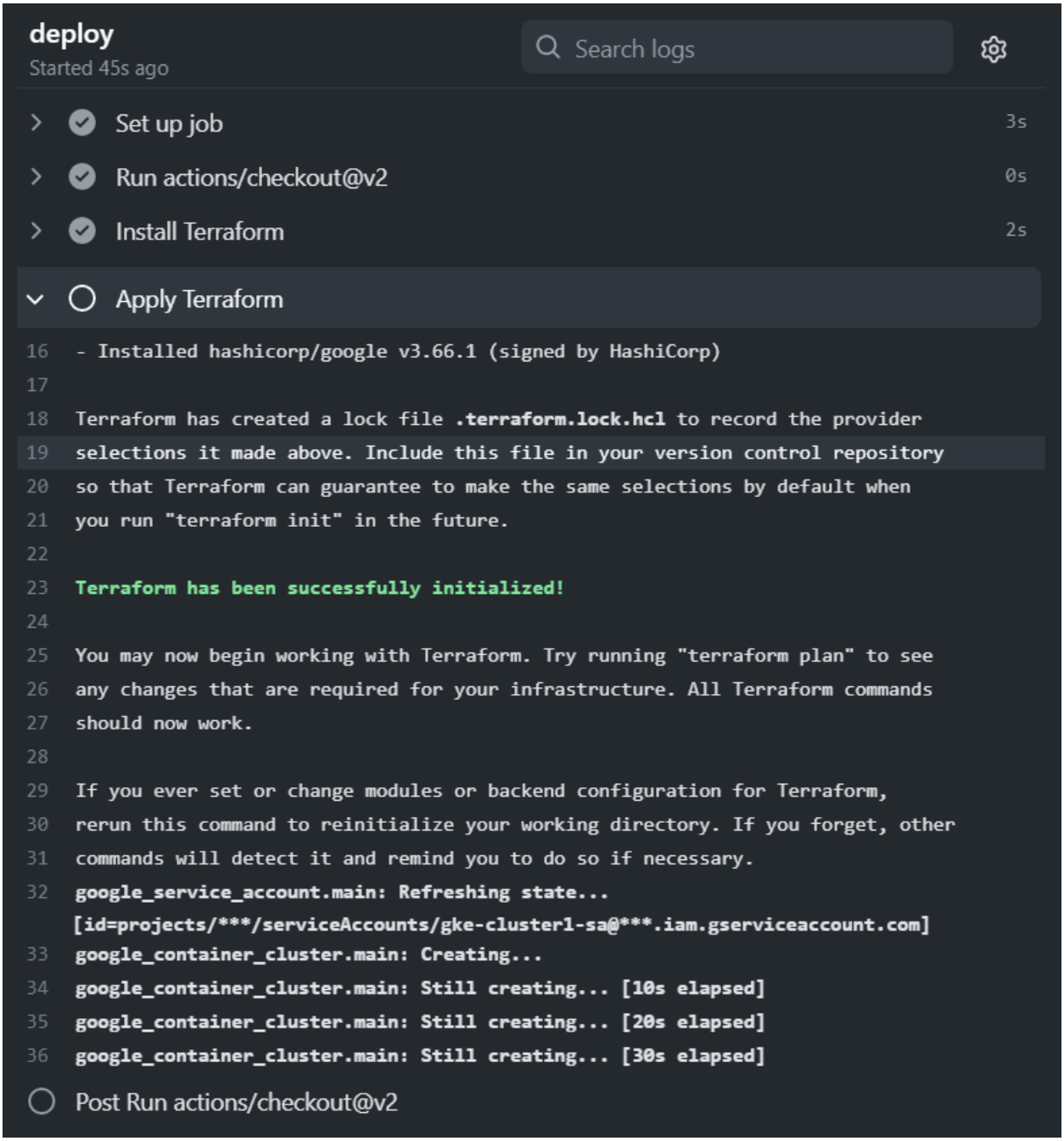


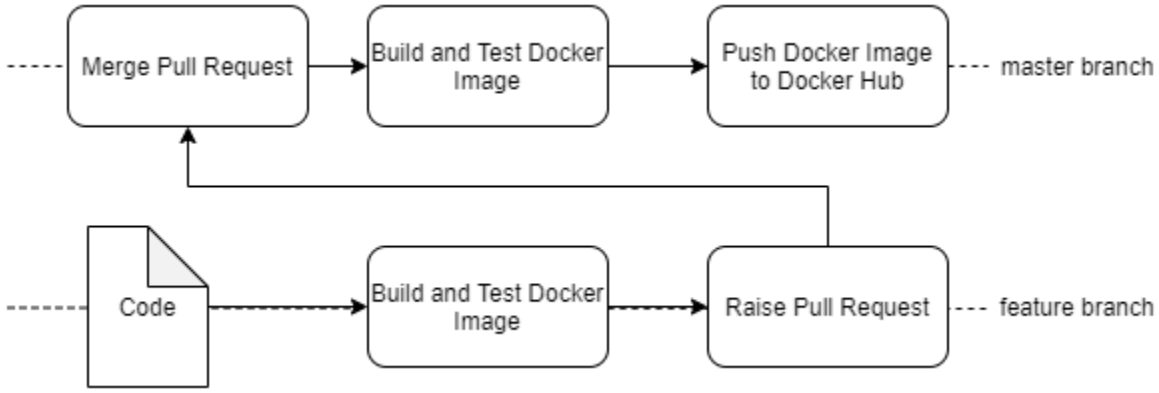

feature branches
develop
release branches
hotfixes
master
Time
Tag 0.1
Major feature for next release
Severe bug fixed for production hotfix 0.2
Feature for future release
Incorporate bugfix in develop
Tag 0.2
From this point on, “next release” means the release after 1.0
Start of release branch for 1.0
Only bugfixes!
Bugfixes from rel.branch may be continously merged back into develop
Tag 1.0

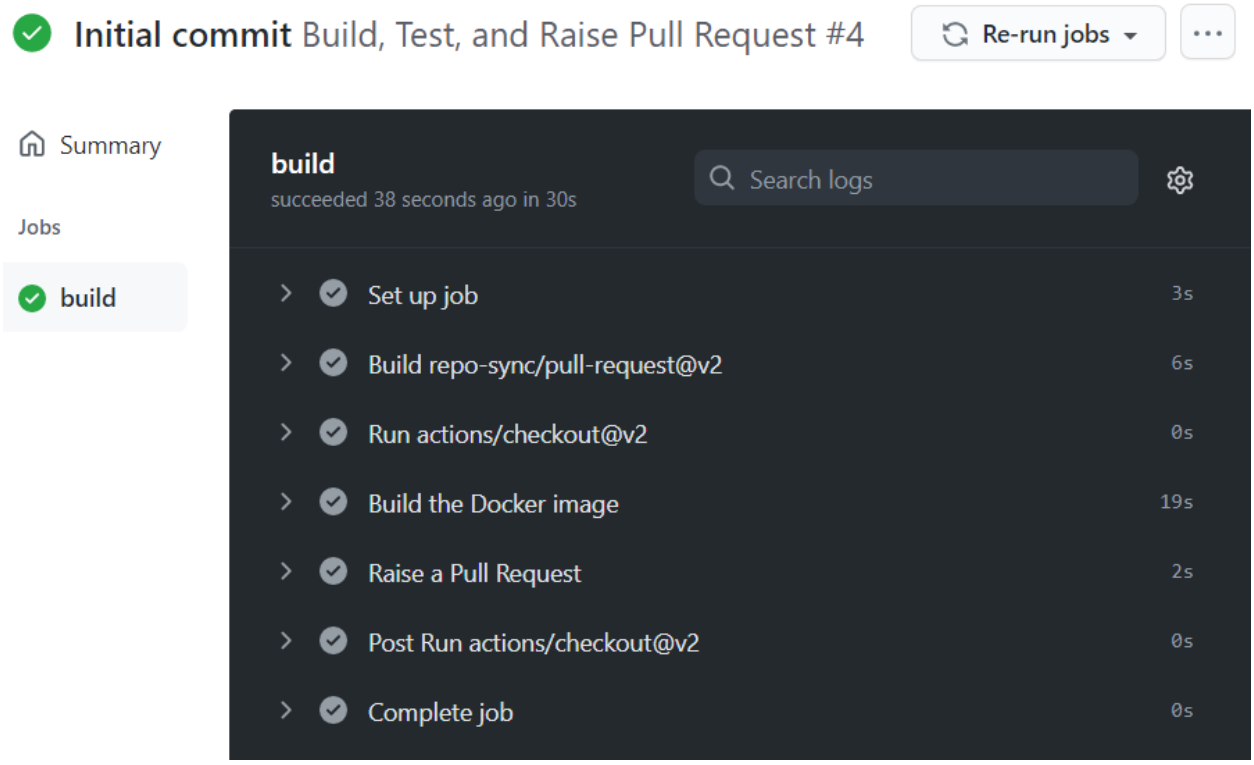



master
deploys to
Production
Pull request
staging
deploys to
Staging
Pull request
test
deploys to
Test
Pull request
develop
deploys to
Dev


deploy
Started 45s ago
Search logs
Set up job
3s
Run actions/checkout@v2
0s
Install Terraform
2s
Apply Terraform
16 - Installed hashicorp/google v3.66.1 (signed by HashiCorp)
17
18 Terraform has created a lock file .terraform.lock.hcl to record the provider
19 selections it made above. Include this file in your version control repository
20 so that Terraform can guarantee to make the same selections by default when
21 you run "terraform init" in the future.
22
23 Terraform has been successfully initialized!
24
25 You may now begin working with Terraform. Try running "terraform plan" to see
26 any changes that are required for your infrastructure. All Terraform commands
27 should now work.
28
29 If you ever set or change modules or backend configuration for Terraform,
30 rerun this command to reinitialize your working directory. If you forget, other
31 commands will detect it and remind you to do so if necessary.
32 google_service_account.main: Refreshing state...
[id=projects/***/serviceAccounts/gke-cluster1-sa@***.iam.gserviceaccount.com]
33 google_container_cluster.main: Creating...
34 google_container_cluster.main: Still creating... [10s elapsed]
35 google_container_cluster.main: Still creating... [20s elapsed]
36 google_container_cluster.main: Still creating... [30s elapsed]
Post Run actions/checkout@v2

# Chapter 14: CI/CD Pipelines with GitOps



# Initial commit #1

Open **bharatmicrosyste...** wants to merge 2 commits into `master` from `feature/flask`

Conversation 0 | Commits 2 | Checks 1 | Files changed 1

**bharatmicrosystems** commented 8 minutes ago — Owner

*No description provided.*

**bharatmicrosystems** added 2 commits 20 minutes ago

 `Initial commit` a125961

 `Initial commit` ✓ e9fb60b

Add more commits by pushing to the **`feature/flask`** branch on **bharatmicrosystems/flask-app-gitops**.

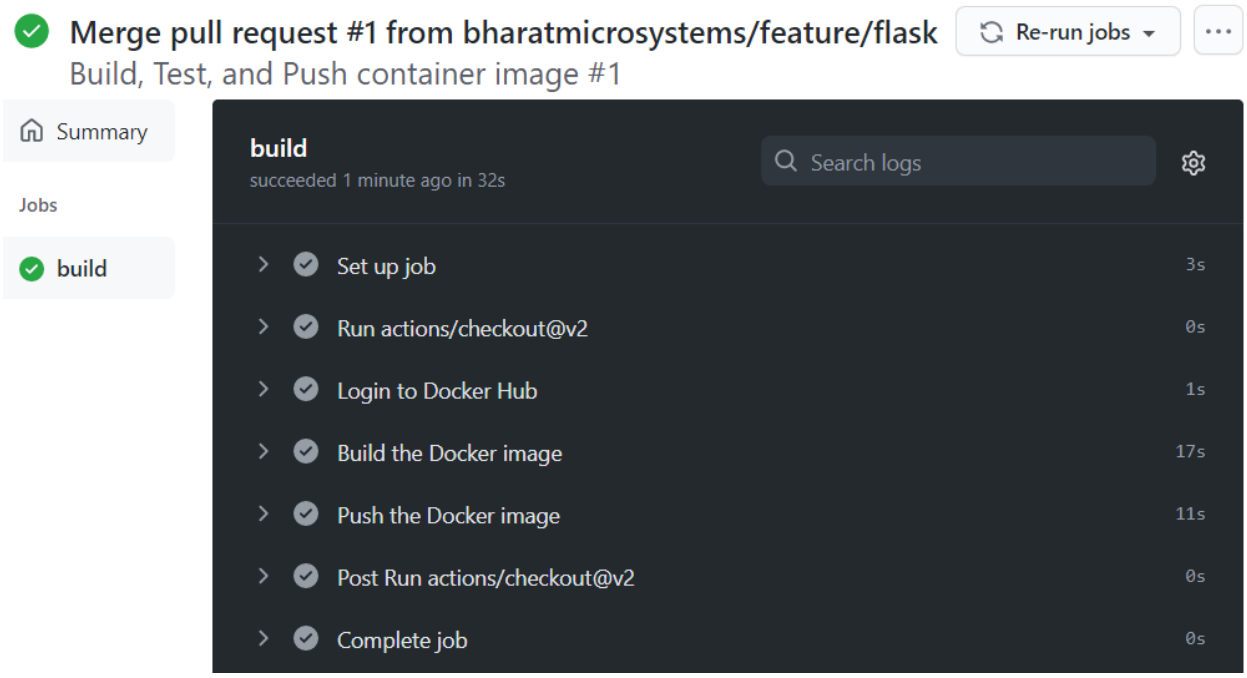
**All checks have passed** — Show all checks

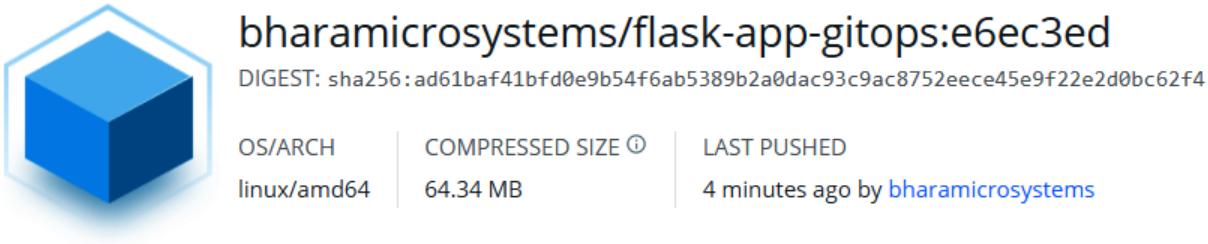
1 successful check

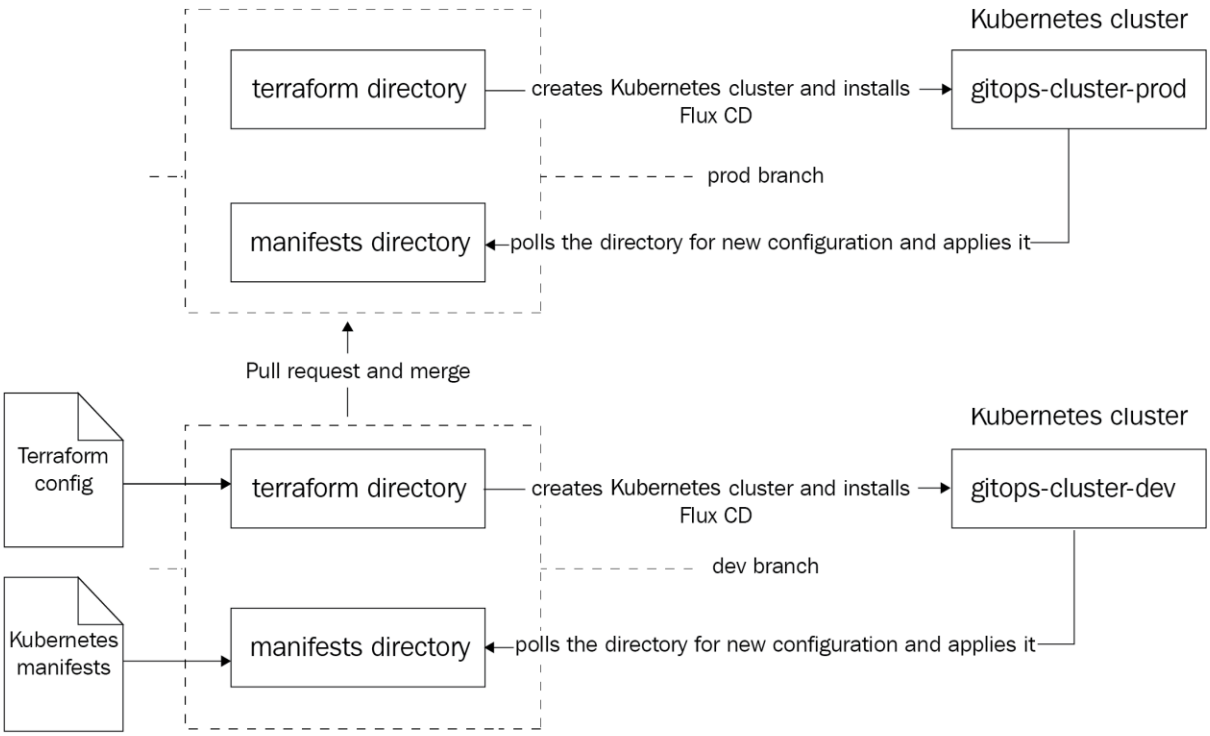
**This branch has no conflicts with the base branch**

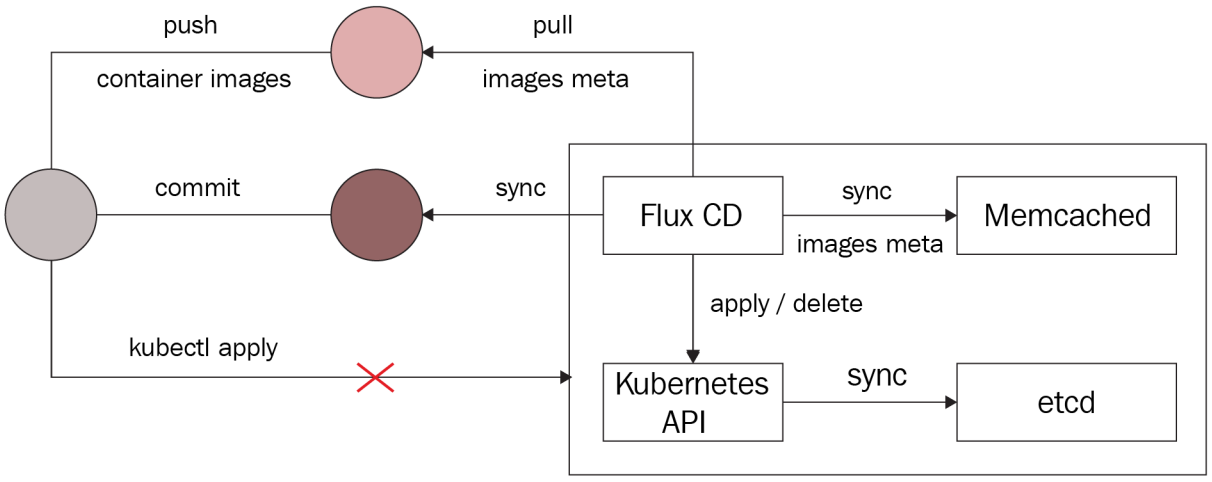
Merging can be performed automatically.

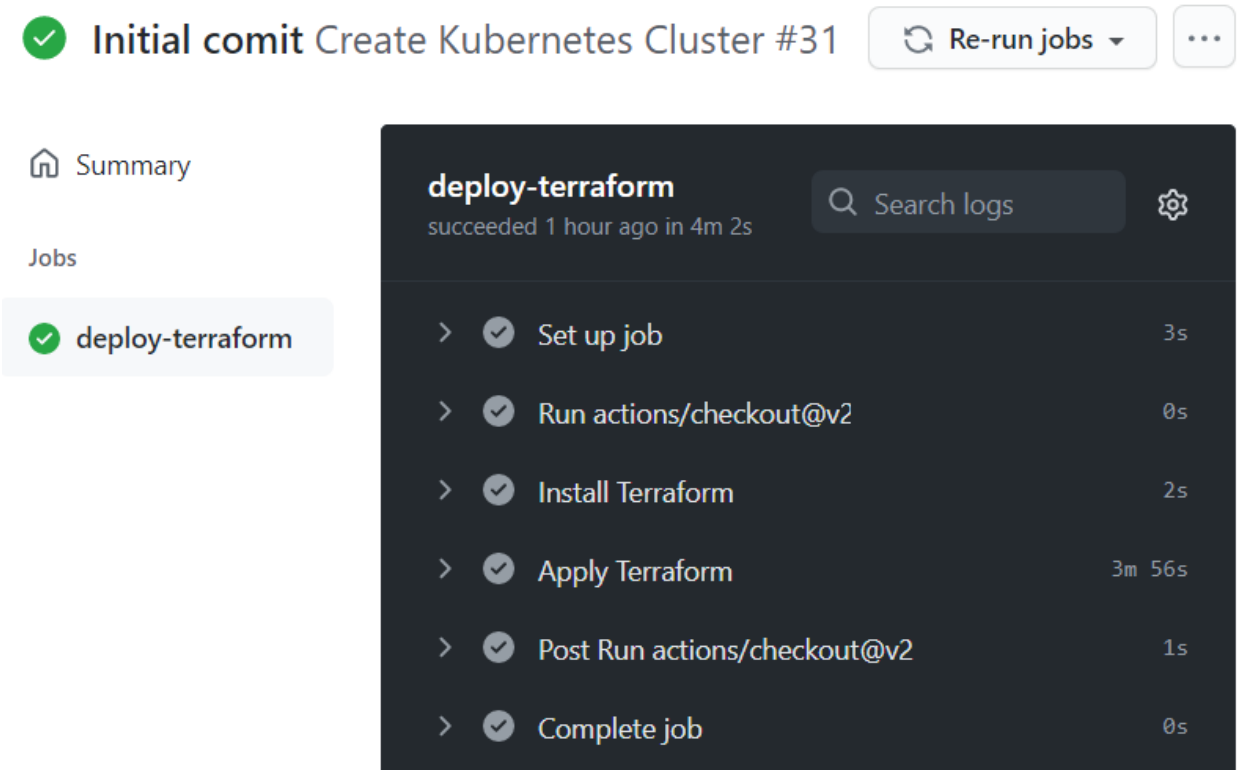
Merge pull request ▾ You can also open this in GitHub Desktop or view command line instructions.

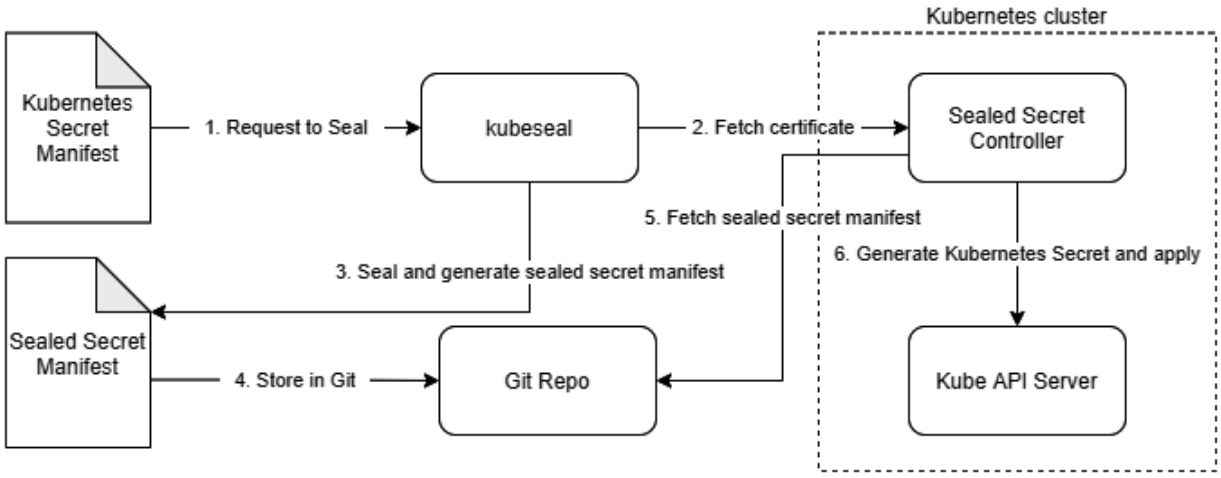

Merge pull request #1 from bharatmicrosystems/feature/flask
Build, Test, and Push container image #1
Re-run jobs
Summary
Jobs
build
build
succeeded 1 minute ago in 32s
Search logs
Set up job 3s
Run actions/checkout@v2 0s
Login to Docker Hub 1s
Build the Docker image 17s
Push the Docker image 11s
Post Run actions/checkout@v2 0s
Complete job 0s


bharamicrosystems/flask-app-gitops:e6ec3ed
DIGEST: sha256:ad61baf41bfd0e9b54f6ab5389b2a0dac93c9ac8752eece45e9f22e2d0bc62f4
OS/ARCH
linux/amd64
COMPRESSED SIZE
64.34 MB
LAST PUSHED
4 minutes ago by bharamicrosystems


Kubernetes cluster
terraform directory
creates Kubernetes cluster and installs Flux CD
gitops-cluster-prod
prod branch
manifests directory
polls the directory for new configuration and applies it
Pull request and merge
Terraform config
Kubernetes cluster
terraform directory
creates Kubernetes cluster and installs Flux CD
gitops-cluster-dev
dev branch
Kubernetes manifests
manifests directory
polls the directory for new configuration and applies it


push
container images
pull
images meta
commit
sync
Flux CD
sync
images meta
Memcached
apply / delete
kubectl apply
Kubernetes API
sync
etcd


Initial comit Create Kubernetes Cluster #31
Re-run jobs
Summary
Jobs
deploy-terraform
deploy-terraform
succeeded 1 hour ago in 4m 2s
Search logs
Set up job 3s
Run actions/checkout@v2 0s
Install Terraform 2s
Apply Terraform 3m 56s
Post Run actions/checkout@v2 1s
Complete job 0s


Kubernetes cluster
Kubernetes Secret Manifest
1. Request to Seal
kubeseal
2. Fetch certificate
Sealed Secret Controller
5. Fetch sealed secret manifest
6. Generate Kubernetes Secret and apply
3. Seal and generate sealed secret manifest
Sealed Secret Manifest
4. Store in Git
Git Repo
Kube API Server