

Practical DevOps for Devs – Assignment

Source Code Management

- Repository for the application: [XQuyTran/sd5129_msa \(github.com\)](https://github.com/XQuyTran/sd5129_msa)
- Repository for the Infrastructure: [XQuyTran/sd5129_infrastructure \(github.com\)](https://github.com/XQuyTran/sd5129_infrastructure)

1. Setting up a CI/CD Pipeline and deploying applications on AWS EKS

Provision AWS resources

```
(base) quytran@VNN0101796:/mnt/d/training/Practical DevOps/infra/aws$ terraform plan
data.aws_iam_policy.eks_worker_policy[2]: Reading...
data.aws_iam_policy.eks_worker_policy[0]: Reading...
data.aws_iam_policy.eks_worker_policy[1]: Reading...
data.aws_iam_policy.document.ec2_assume_role: Reading...
data.aws_iam_policy.eks_cluster_policy: Reading...
data.aws_iam_policy.document.eks_assume_role: Reading...
data.aws_iam_policy.document.eks_assume_role: Read complete after 0s [id=764451762]
data.aws_iam_policy.document.ec2_assume_role: Read complete after 0s [id=1470195627]
data.aws_iam_policy.eks_worker_policy[0]: Read complete after 5s [id=arn:aws:iam::aws:policy/AmazonEKS_CNI_Policy]
data.aws_iam_policy.eks_cluster_policy: Read complete after 5s [id=arn:aws:iam::aws:policy/AmazonEKSClusterPolicy]
data.aws_iam_policy.eks_worker_policy[1]: Read complete after 5s [id=arn:aws:iam::aws:policy/AmazonEKSWorkerNodePolicy]
data.aws_iam_policy.eks_worker_policy[2]: Read complete after 5s [id=arn:aws:iam::aws:policy/AmazonEC2ContainerRegistryReadOnly]

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# aws_ecr_repository.backend will be created
+ resource "aws_ecr_repository" "backend" {
  + arn                = (known after apply)
  + id                 = (known after apply)
  + image_tag_mutability = "MUTABLE"
  + name               = "ntg-garage-backend"
  + registry_id        = (known after apply)
  + repository_url      = (known after apply)
  + tags_all           = {
    + "Org"      = "NT"
    + "Project" = "Practical DevOps"
  }
}

# aws_ecr_repository.frontend will be created
+ resource "aws_ecr_repository" "frontend" {
  + arn                = (known after apply)
  + id                 = (known after apply)
  + image_tag_mutability = "MUTABLE"
  + name               = "ntg-garage-frontend"
  + registry_id        = (known after apply)
  + repository_url      = (known after apply)
  + tags_all           = {
    + "Org"      = "NT"
    + "Project" = "Practical DevOps"
  }
}

# aws_eks_addon.this[0] will be created
+ resource "aws_eks_addon" "this" {
  + addon_name      = "kube-proxy"
  + addon_version    = (known after apply)
  + arn              = (known after apply)
  + cluster_name     = "practicaldevops"
  + configuration_values = (known after apply)
  + created_at       = (known after apply)
}
```

[Alt+S]

Singaporeqtran

VPC > Your VPCs > vpc-0806b669d1363d147

vpc-0806b669d1363d147

Actions

Details

VPC ID

vpc-0806b669d1363d147

Tenancy

Default

Default VPC

No

Network Address Usage metrics

Disabled

State

Available

DHCP option set

dopt-0e3d00a50a4170786

IPv4 CIDR

192.168.10.0/24

Route 53 Resolver DNS Firewall rule groups

-

DNS hostnames

Enabled

Main route table

rtb-0a18485cf056920cc

IPv6 pool

-

Owner ID

063439157700

DNS resolution

Enabled

Main network ACL

acl-0e015c6a6c2609c9e

IPv6 CIDR (Network border group)

-

Resource map

CIDRs

Flow logs

Tags

Integrations

Resource map

VPC

Subnets (3)

Route tables (2)

Network connections (1)

aws

Services

ecr

Singaporeqtran

EKS > Clusters > practicaldevops-cluster

practicaldevops-cluster

RefreshDelete cluster

Cluster info

Status

Active

Kubernetes version

1.30

Support period

Standard support until July 28, 2025

Provider

EKS

Overview

Resources

Compute

Networking

Add-ons

Access

Observability

Nodes (0)

Filter Nodes by property or value

1

Node name

Instance type

Node group

Created

Status

No Nodes

This cluster does not have any Nodes, or you don't have permission to view them.

Node groups (1)

Edit

Delete

Add node group

Group name

Desired size

AMI release version

Launch template

Status

nodegroup

0

1.30.2-20240807

-

Active

Create IAM user for Jenkins pipeline to push image

The screenshot shows the AWS IAM console interface for creating a new user. The breadcrumb navigation is IAM > Users > Create user. The page is divided into three steps: Step 1 (Specify user details), Step 2 (Set permissions), and Step 3 (Review and create). The 'Review and create' step is active, showing a summary of the user details and permissions.

Review and create
Review your choices. After you create the user, you can view and download the autogenerated password, if enabled.

User details

User name ecr	Console password type None	Require password reset No
------------------	-------------------------------	------------------------------

Permissions summary

Name	Type	Used as
AmazonEC2ContainerRegistryPowerUser	AWS managed	Permissions policy

Jenkins Installation

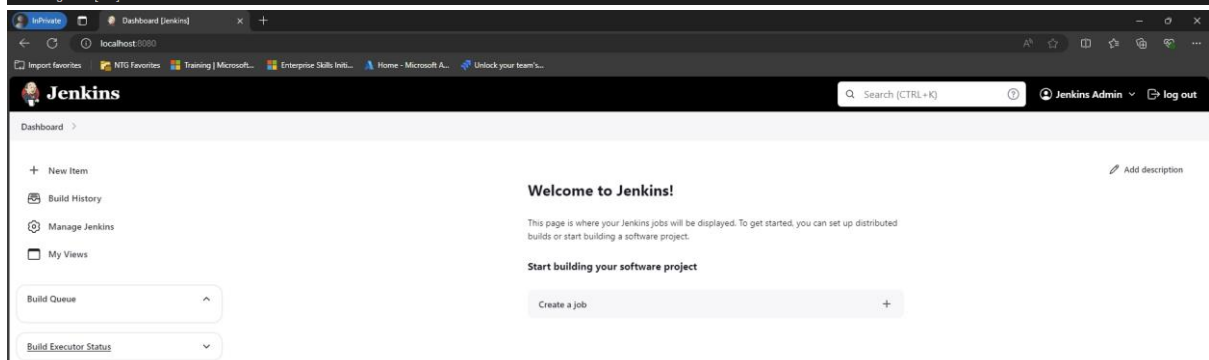
Create namespace and service account for Jenkins

```
! jenkins-sa.yaml > apiVersion
io.k8s.api.rbac.v1.ClusterRoleBinding (v1@clusterrolebinding.json) | io.k8s.api.rbac.v1
1  apiVersion: v1
2  kind: ServiceAccount
3  metadata:
4    name: jenkins
5    namespace: jenkins
6  ---
7  apiVersion: rbac.authorization.k8s.io/v1
8  kind: ClusterRole
9  metadata:
10   annotations:
11     rbac.authorization.kubernetes.io/autoupdate: "true"
12   labels:
13     kubernetes.io/bootstrapping: rbac-defaults
14   name: jenkins
15  rules:
16  - apiGroups:
17    - '*'
18    resources:
19    - statefulsets
20    - services
21    - replicationcontrollers
22    - replicaset
23    - podtemplates
24    - podsecuritypolicies
25    - pods
26    - pods/log
27    - pods/exec
28    - podpreset
29    - poddisruptionbudget
30    - persistentvolumes
31    - persistentvolumeclaims
32    - jobs
33    - endpoints
34    - deployments
35    - deployments/scale
36    - daemonsets
37    - cronjobs
38    - configmaps
39    - namespaces
40    - events
41    - secrets
15  rules:
16  - apiGroups:
41    - secrets
42  verbs:
43    - create
44    - get
45    - watch
46    - delete
47    - list
48    - patch
49    - update
50  - apiGroups:
51    - ""
52  resources:
53    - nodes
54  verbs:
55    - get
56    - list
57    - watch
58    - update
59  ---
60  apiVersion: rbac.authorization.k8s.io/v1
61  kind: ClusterRoleBinding
62  metadata:
63  annotations:
64    rbac.authorization.kubernetes.io/autoupdate: "true"
65  labels:
66    kubernetes.io/bootstrapping: rbac-defaults
67  name: jenkins
68  roleRef:
69    apiGroup: rbac.authorization.k8s.io
70    kind: ClusterRole
71    name: jenkins
72  subjects:
73  - apiGroup: rbac.authorization.k8s.io
74    kind: Group
75    name: system:serviceaccounts:jenkins
```

Install Jenkins Helm chart with custom values to use the pre-defined service account

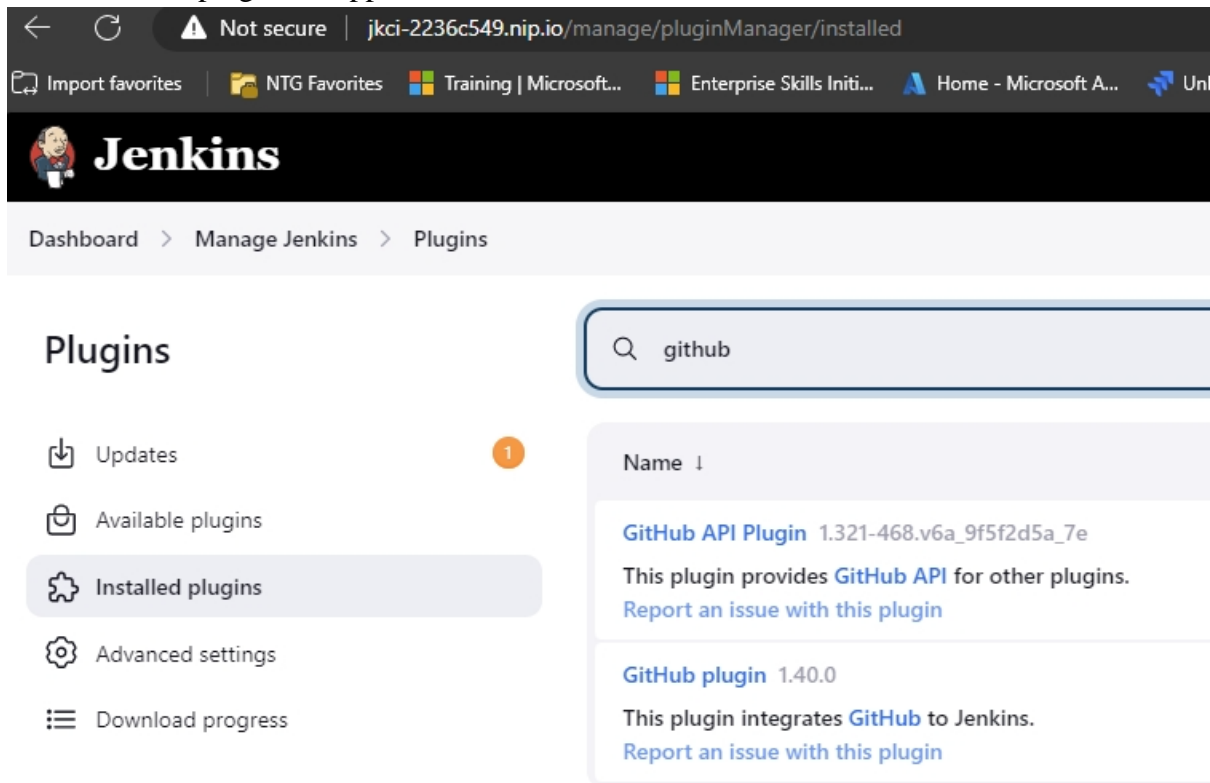
```
D: > training > Pratical DevOps > infra > jenkins > ! jenkins-values.yml > {} controller > {} ingress > [ ] paths > {} 0 > {} backend
1 controller:
2   resources:
3     limits:
4       cpu: '1'
5       memory: 1Gi
6   initContainerResources:
7     limits:
8       cpu: "1"
9       memory: "1Gi"
10  ingress:
11    enabled: true
12    hostName: jkci-223104de.nip.io
13    paths:
14      - backend:
15        service:
16          name: jenkins
17          port:
18            number: 8080
19        pathType: Prefix
20        path: /
21    annotations:
22      nginx.ingress.kubernetes.io/enable-cors: "true"
23      nginx.ingress.kubernetes.io/cors-allow-origin: "https://github.com"
24      nginx.ingress.kubernetes.io/whitelist-source-range: "115.79.196.39/32"
25  persistence:
26    storageClass: standard
27  agent:
28    enabled: false
29  serviceAccount:
30    create: false
31
```

```
(base) quytang@WK0101796:/mnt/d/training/Pratical DevOps/infra$ helm install -n jenkins -f jenkins-values.yml jenkins jenkinsci/jenkins
coalesce.go:289: warning: destination for jenkins.controller.installPlugins is a table. Ignoring non-table value ((kubernetes:4253.v7700d91739e5 workflow-aggregator:600.vb_57cdd26fdd7 git:5.2.2 configuration-as-code:1836.vccda_4a_122a_9_e))
NAME: jenkins
LAST DEPLOYED: Wed Jul 31 16:55:10 2024
NAMESPACE: jenkins
STATUS: deployed
REVISION: 1
NOTES:
1. Get your 'admin' user password by running:
   kubectl exec --namespace jenkins -it svc/jenkins -c jenkins -- /bin/cat /run/secrets/additional/chart-admin-password && echo
2. Get the Jenkins URL to visit by running these commands in the same shell:
   echo http://127.0.0.1:8080
   kubectl --namespace jenkins port-forward svc/jenkins 8080:8080
3. Login with the password from step 1 and the username: admin
4. Configure security realm and authorization strategy
5. Use Jenkins Configuration as Code by specifying configs/scripts in your values.yaml file, see documentation: http://127.0.0.1:8080/configuration-as-code and examples: https://github.com/jenkinsci/configuration-as-code-plugin/tree/master/demos
For more information on running Jenkins on Kubernetes, visit:
https://cloud.google.com/solutions/jenkins-on-container-engine
For more information about Jenkins Configuration as Code, visit:
https://jenkins.io/projects/jcasc/
NOTE: Consider using a custom image with pre-installed plugins
(base) quytang@WK0101796:/mnt/d/training/Pratical DevOps/infra$ kubectl --namespace jenkins port-forward svc/jenkins 8080:8080
Forwarding from 127.0.0.1:8080 -> 8080
Forwarding from [::1]:8080 -> 8080
```



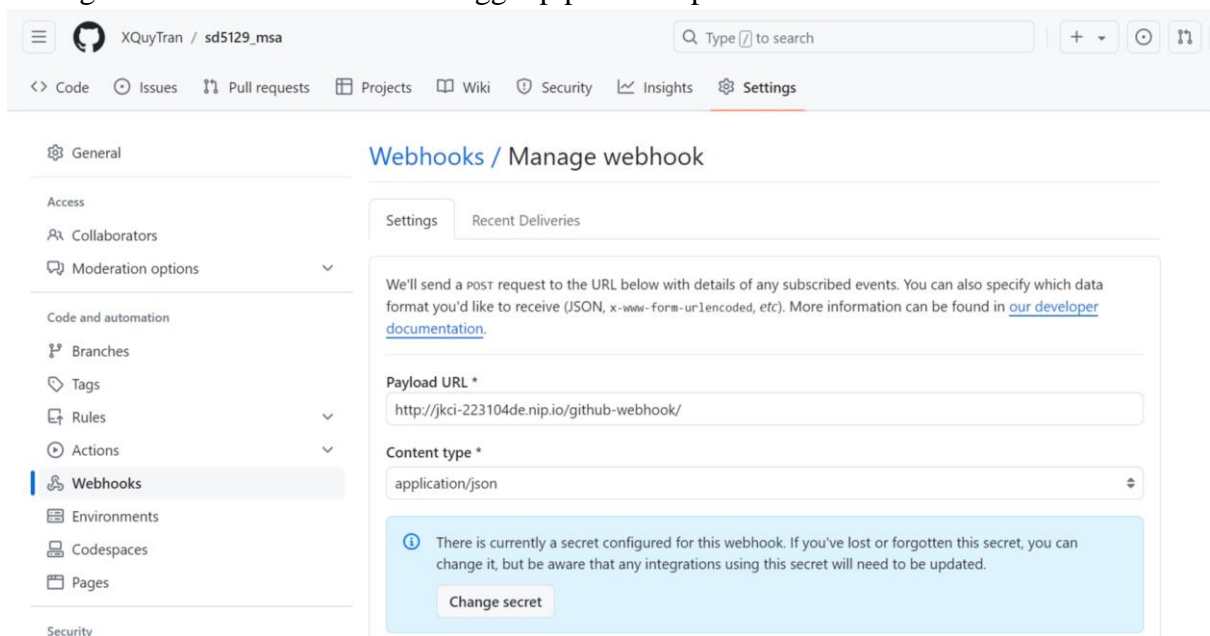
Setup Jenkins pipeline for CI/CD

Install GitHub plugin to support receive webhooks



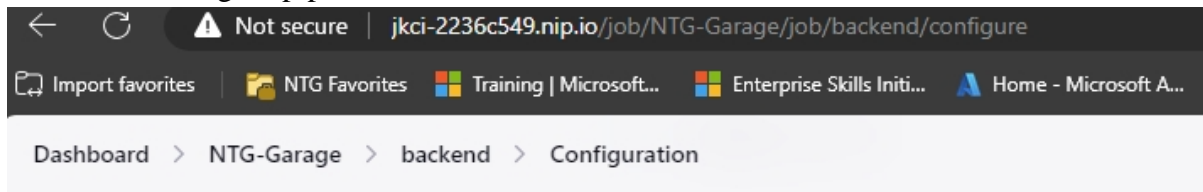
The screenshot shows the Jenkins web interface. At the top, the browser address bar displays 'jkci-2236c549.nip.io/manage/pluginManager/installed'. The Jenkins logo and name are prominently displayed. Below the navigation bar, the breadcrumb path is 'Dashboard > Manage Jenkins > Plugins'. The main heading is 'Plugins'. On the left, there is a sidebar with links: 'Updates' (with a notification badge), 'Available plugins', 'Installed plugins' (which is highlighted), 'Advanced settings', and 'Download progress'. On the right, a search bar contains the text 'github'. Below the search bar, a list of installed plugins is shown. The first plugin is 'GitHub API Plugin' version '1.321-468.v6a_9f5f2d5a_7e', with a description 'This plugin provides GitHub API for other plugins.' and a link to 'Report an issue with this plugin'. The second plugin is 'GitHub plugin' version '1.40.0', with a description 'This plugin integrates GitHub to Jenkins.' and a link to 'Report an issue with this plugin'.

Configure webhook on GitHub to trigger pipeline on push



The screenshot shows the GitHub web interface for a repository named 'XQuYTran / sd5129_msa'. The 'Settings' tab is selected in the top navigation bar. On the left sidebar, the 'Webhooks' option is highlighted under the 'Code and automation' section. The main content area is titled 'Webhooks / Manage webhook'. It has two tabs: 'Settings' (active) and 'Recent Deliveries'. The 'Settings' tab contains a description: '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.' Below this, there is a 'Payload URL *' field with the value 'http://jkci-223104de.nip.io/github-webhook/'. There is also a 'Content type *' dropdown menu set to 'application/json'. At the bottom, a blue information box states: 'There is currently a secret configured for this webhook. If you've lost or forgotten this secret, you can change it, but be aware that any integrations using this secret will need to be updated.' with a 'Change secret' button.

Create and configure pipeline file location for backend service



Configure

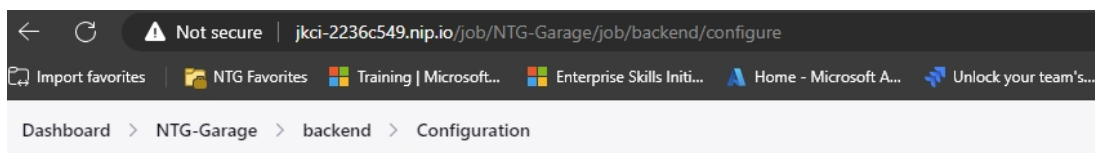
General

Advanced Project Options

Pipeline

Build Triggers

- ☐ Build after other projects are built ?
- ☐ Build periodically ?
- ☒ GitHub hook trigger for GITScm polling ?
- ☐ Poll SCM ?
- ☐ Quiet period ?
- ☐ Trigger builds remotely (e.g., from scripts) ?



Configure

General

Advanced Project Options

Pipeline

Pipeline

Definition

Pipeline script from SCM

SCM ?

Git

Repositories ?

Repository URL ?

`https://github.com/XQuyTran/sd5129_msa.git`

Credentials ?

- none -

+ Add ▾

Advanced ▾

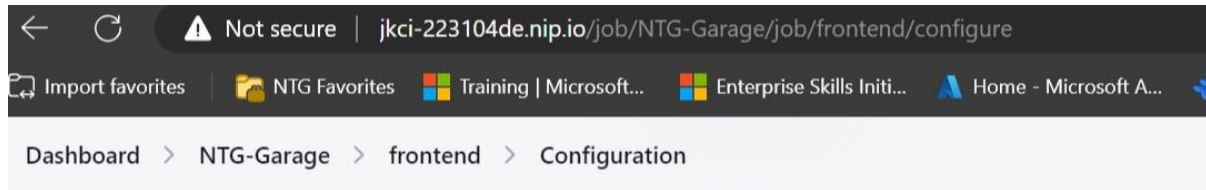
Add Repository

Branches to build ?

Branch Specifier (blank for 'any') ?

`*/*`

Create and configure pipeline file location for frontend service



Configure

 General

 Advanced Project Options

 Pipeline

Build Triggers

- ☐ Build after other projects are built ?
- ☐ Build periodically ?
- ☒ GitHub hook trigger for GITScm polling ?
- ☐ Poll SCM ?
- ☐ Quiet period ?
- ☐ Trigger builds remotely (e.g., from scripts) ?

Configure

- ⚙ General
- 🔧 Advanced Project Options
- 🔗 Pipeline**

Pipeline

Definition

Pipeline script from SCM

SCM ?

Git

Help for feature: Repositories

Repositories ?

Repository URL ?

https://github.com/XQuyTran/sd5129_msa.git

Credentials ?

- none -

Configure

- ⚙ General
- 🔧 Advanced Project Options
- 🔗 Pipeline**

Repository browser ?

(Auto)

Additional Behaviours

Add ▼

Script Path ?


src/frontend/Jenkinsfile

☐ Lightweight checkout ?

Configure AWS Access Key for Jenkins IAM user

← ↻ ⚠ Not secure | jkci-223104de.nip.io/job/NTG-Garage/credentials/store/folder/domain/AWS/



Import favorites | NTG Favorites | Training | Microsoft... | Enterprise Skills Initi... | Home - Microsoft A... | Unlock your team's...

 **Jenkins** Search (CTRL+K)

Dashboard > NTG-Garage > Credentials > Folder > AWS >

AWS

[+ Add Credentials](#)[Configure](#)

ID	Name	Kind
 AWS_ACCESS_KEY_ID	AWS_ACCESS_KEY_ID	Secret text
 AWS_SECRET_ACCESS_KEY	AWS_SECRET_ACCESS_KEY	Secret text

Create Jenkins pipeline to build and deploy applications

← ↻ ⚠ Not secure | jkci-223104de.nip.io/job/NTG-Garage/job/backend/25/console

Import favorites | NTG Favorites | Training | Microsoft... | Enterprise Skills Initi... | Home - Microsoft A... | Unlock your team's...

Dashboard > NTG-Garage > backend > #25

```
0
0
100 138 100 138 0 0 570 0 ---:---: ---:---: ---:---:
570

100 53.7M 100 53.7M 0 0 58.3M 0 ---:---: ---:---: ---:---:
58.3M
+ chmod +x ./kubectl
+ aws eks update-kubeconfig --region ap-southeast-1 --name
practicaldevops-cluster
Added new context arn:aws:eks:ap-southeast-
1:063439157700:cluster/practicaldevops-cluster to /root/.kube/config
+ ./kubectl apply -f deployment/backend.yaml -n services
service/backend created
deployment.apps/backend created
[Pipeline] }
[Pipeline] // container
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
Agent ntg-garage-backend-25-1d482-j6p4j-9fkkt was deleted, but do not
have a node body to cancel
[Pipeline] // node
[Pipeline] }
[Pipeline] // podTemplate
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // timeout
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] End of Pipeline
Finished: SUCCESS
```

Dashboard > NTG-Garage > frontend > #26

```
>speed

0      0      0      0      0      0      0      0  --:--:-- --:--:-- --:--:--
0
100    138    100    138    0      0      580    0  --:--:-- --:--:-- --:--:--
582

100 53.7M 100 53.7M 0      0      82.6M    0  --:--:-- --:--:-- --:--:--
82.6M
+ chmod +x ./kubectl
+ aws eks update-kubeconfig --region ap-southeast-1 --name
practicaldevops-cluster
Added new context arn:aws:eks:ap-southeast-
1:063439157700:cluster/practicaldevops-cluster to /root/.kube/config
+ ./kubectl apply -f deployment/frontend.yaml -n services
service/frontend unchanged
deployment.apps/frontend created
[Pipeline] }
[Pipeline] // container
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] }
[Pipeline] // podTemplate
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // timeout
[Pipeline] }
[Pipeline] // withCredentials
[Pipeline] End of Pipeline
Finished: SUCCESS
```

← ↻ 🔒 https://ap-southeast-1.console.aws.amazon.com/eks/home?region=ap-southeast-1#/clusters/practicaldevops-cluster/selected-tab=cluster-resources-tab/selectedResourceId=deployments

🔗 Import favorites 📁 NTG Favorites 📁 Training | Microsoft... 📁 Enterprise Skills Initi... 🏠 Home - Microsoft A... 🔑 Unlock your team's...

practicaldevops-cluster 🔄 Delete cluster

▼ **Cluster info** Info

Status 🟢 Active	Kubernetes version <small>Info</small> 1.30	Support period 🕒 Standard support until July 28, 2025	Provider EKS
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Overview **Resources** Compute Networking Add-ons Access Observability Upgrade insights Update history Tags

Resource types ×

- Workloads
- PodTemplates
- Pods
- ReplicaSets
- Deployments**
- StatefulSets
- DaemonSets
- Jobs
- CronJobs
- PriorityClasses
- HorizontalPodAutoscalers

Workloads: Deployments (3) View details

Deployment is an API object that manages a replicated application, typically by running Pods with no local state. [Learn more](#)

All Namespaces

	Name	Namespace	Type	Age	Pod count	Status
○	backend	services	deployments	Created 🕒 9 minutes ago	1	<div><div></div></div> 1 Ready 0 Failed 1 Desired
○	coredns	kube-system	deployments	Created 🕒 5 hours ago	2	<div><div></div></div> 2 Ready 0 Failed 2 Desired
○	frontend	services	deployments	Created 🕒 11 minutes ago	1	<div><div></div></div> 1 Ready 0 Failed 1 Desired

Setup Prometheus and Grafana to monitor EKS resource

Deploy Prometheus

```
(base) qaytran@MM0101796:/mnt/d/training/Practical DevOps/sd5129_msa$ helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
"prometheus-community" has been added to your repositories
(base) qaytran@MM0101796:/mnt/d/training/Practical DevOps/sd5129_msa$ helm repo update
Hang tight while we grab the latest from your chart repositories...
...Successfully got an update from the "crossplane-stable" chart repository
...Successfully got an update from the "ingress-nginx" chart repository
...Successfully got an update from the "jetstack" chart repository
...Successfully got an update from the "kyverno" chart repository
...Successfully got an update from the "jenkinsci" chart repository
...Successfully got an update from the "argo" chart repository
...Successfully got an update from the "prometheus-community" chart repository
Update Complete. Happy Helming!
(base) qaytran@MM0101796:/mnt/d/training/Practical DevOps/sd5129_msa$ helm install -n prometheus prometheus prometheus-community/prometheus
NAME: prometheus
LAST DEPLOYED: Tue Aug 20 16:01:30 2024
NAMESPACE: prometheus
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
The Prometheus server can be accessed via port 80 on the following DNS name from within your cluster:
prometheus-server.prometheus.svc.cluster.local

Get the Prometheus server URL by running these commands in the same shell:
export POD_NAME=$(kubectl get pods --namespace prometheus -l "app.kubernetes.io/name=prometheus,app.kubernetes.io/instance=prometheus" -o jsonpath="{.items[0].metadata.name}")
kubectl --namespace prometheus port-forward $POD_NAME 9090

The Prometheus alertmanager can be accessed via port 9093 on the following DNS name from within your cluster:
prometheus-alertmanager.prometheus.svc.cluster.local

Get the Alertmanager URL by running these commands in the same shell:
export POD_NAME=$(kubectl get pods --namespace prometheus -l "app.kubernetes.io/name=alertmanager,app.kubernetes.io/instance=prometheus" -o jsonpath="{.items[0].metadata.name}")
kubectl --namespace prometheus port-forward $POD_NAME 9093
#####
##### WARNING: Pod Security Policy has been disabled by default since #####
##### it deprecated after k8s 1.25+, use #####
##### (index .Values "prometheus-node-exporter" "rbac" #####
##### "pspEnabled") with (index .Values #####
##### "prometheus-node-exporter" "rbac" "pspAnnotations") #####
##### in case you still need it. #####
#####

The Prometheus PushGateway can be accessed via port 9091 on the following DNS name from within your cluster:
prometheus-prometheus-pushgateway.prometheus.svc.cluster.local

Get the PushGateway URL by running these commands in the same shell:
```

Deploy Grafana

```
environment > grafana > ! grafana.yaml > {} datasources > {} datasources.yaml > [ ] datasources > {} 0 > isDefault
1  ∨ datasources:
2  ∨   datasources.yaml:
3      apiVersion: 1
4  ∨   datasources:
5  ∨     - name: Prometheus
6      type: prometheus
7      url: http://prometheus-server.prometheus.svc.cluster.local
8      access: proxy
9      isDefault: true

(base) quyttran@MN0101796:/mnt/d/training/Practical DevOps/infra$ helm repo add grafana https://grafana.github.io/helm-charts
"grafana" has been added to your repositories
(base) quyttran@MN0101796:/mnt/d/training/Practical DevOps/infra$ helm repo update
Hang tight while we grab the latest from your chart repositories...
...Successfully got an update from the "crossplane-stable" chart repository
...Successfully got an update from the "jetstack" chart repository
...Successfully got an update from the "ingress-nginx" chart repository
...Successfully got an update from the "kyverno" chart repository
...Successfully got an update from the "jenkinsci" chart repository
...Successfully got an update from the "prometheus-community" chart repository
...Successfully got an update from the "argo" chart repository
...Successfully got an update from the "grafana" chart repository
Update Complete. 🎉Happy Helming!🎉
(base) quyttran@MN0101796:/mnt/d/training/Practical DevOps/infra$ helm install grafana grafana/grafana \
--namespace grafana \
> ^C
(base) quyttran@MN0101796:/mnt/d/training/Practical DevOps/infra$ ^C
(base) quyttran@MN0101796:/mnt/d/training/Practical DevOps/infra$ helm install grafana grafana/grafana \
> -n grafana \
> --values ./environment/grafana/grafana.yaml \
> --create-namespace
NAME: grafana
LAST DEPLOYED: Tue Aug 20 16:14:39 2024
NAMESPACE: grafana
STATUS: deployed
REVISION: 1
NOTES:
1. Get your 'admin' user password by running:

    kubectl get secret --namespace grafana grafana -o jsonpath="{.data.admin-password}" | base64 --decode ; echo

2. The Grafana server can be accessed via port 80 on the following DNS name from within your cluster:

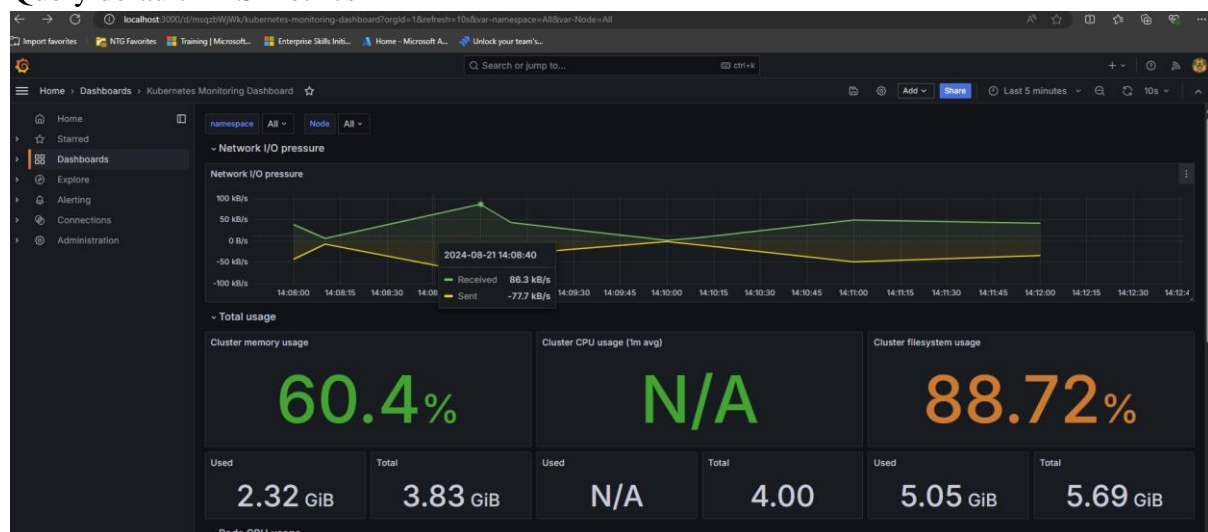
    grafana.grafana.svc.cluster.local

    Get the Grafana URL to visit by running these commands in the same shell:
    export POD_NAME=$(kubectl get pods --namespace grafana -l "app.kubernetes.io/name=grafana,app.kubernetes.io/instance=grafana" -o jsonpath="{.items[0].metadata.name}")
    kubectl --namespace grafana port-forward $POD_NAME 3000

3. Login with the password from step 1 and the username: admin

#####
##### WARNING: Persistence is disabled!!! You will lose your data when #####
##### the Grafana pod is terminated. #####
#####
```

Query default EKS metrics



2. Reuse Jenkins CI and use GitOps for the CD pipeline.

Install ArgoCD

```
(base) anfr@MN0101796:/mnt/d/training/Practical DevOps/infra/aes$ helm install -n argocd --create-namespace argo-cd argo/argo-cd --version 7.4.4
NAME: argo-cd
LAST DEPLOYED: Wed Aug 21 14:58:38 2024
NAMESPACE: argocd
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
In order to access the server UI you have the following options:

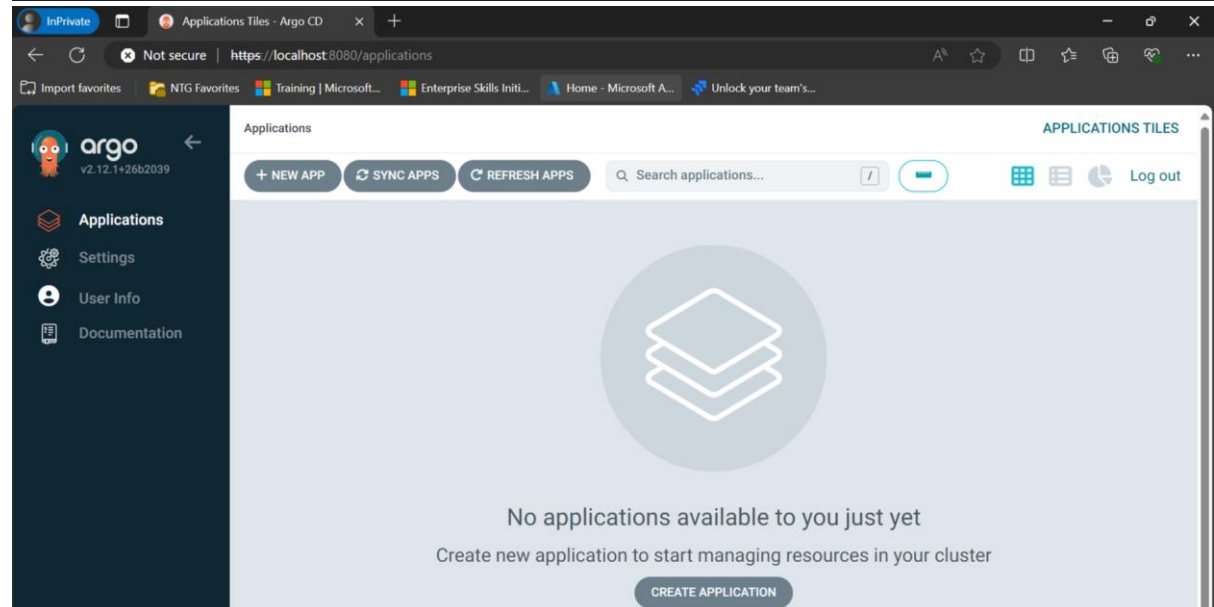
1. kubectl port-forward service/argo-cd-argocd-server -n argocd 8080:443

    and then open the browser on http://localhost:8080 and accept the certificate

2. enable ingress in the values file 'server.ingress.enabled' and either
   - Add the annotation for ssl passthrough: https://argo-cd.readthedocs.io/en/stable/operator-manual/ingress/#option-1-ssl-passthrough
   - Set the 'configs.params.'server.insecure'' in the values file and terminate SSL at your ingress: https://argo-cd.readthedocs.io/en/stable/operator-manual/ingress/#option-2-multiple-ingress-objects-and-hosts

After reaching the UI the first time you can login with username: admin and the random password generated during the installation. You can find the password by running:
kubectl -n argocd get secret argocd-initial-admin-secret -o jsonpath="{.data.password}" | base64 -d

(You should delete the initial secret afterwards as suggested by the Getting Started Guide: https://argo-cd.readthedocs.io/en/stable/getting_started/#4-login-using-the-cli)
```



Create application in ArgoCD

SUMMARYPARAMETERSMANIFESTEVENTS

NTG-GARAGE

EDIT

PROJECTdefault

ANNOTATIONS

CLUSTERin-cluster (https://kubernetes.default.svc)

NAMESPACEservices

CREATED AT08/25/2024 16:34:50 (5 minutes ago)

REPO URLhttps://github.com/XQuyTran/sd5129_msa.git

TARGET REVISIONpipeline

PATHdeployment/

SYNC OPTIONS

RETRY OPTIONSRetry disabled

STATUSSynced to pipeline (82a6639)

HEALTHHealthy

LINKS

IMAGES063439157700.dkr.ecr.ap-southeast-1.amazonaws.com/ntg-garage-backend:1.0063439157700.dkr.ecr.ap-southeast-1.amazonaws.com/ntg-garage-frontend:1.0

Applications / ntg-garage

APPLICATION DETAILS TREE

DETAILSDIFFSYNCSYNC STATUSHISTORY AND ROLLBACKDELETEREFRESH

APP HEALTHHealthy

SYNC STATUSSynced to pipeline (82a6639)

Auto sync is not enabled.
Author: Quy Tran <xuanquyng@gmail.com>
Comment: disable custom storage class

LAST SYNC Sync OK to 82a6639

Succeeded a few seconds ago (Sun Aug 25 2024 16:39:20 GMT+0700)
Author: Quy Tran <xuanquyng@gmail.com>
Comment: delete unused resources

ntg garage

backend

frontend

backend

frontend

backend-74b99d67f5

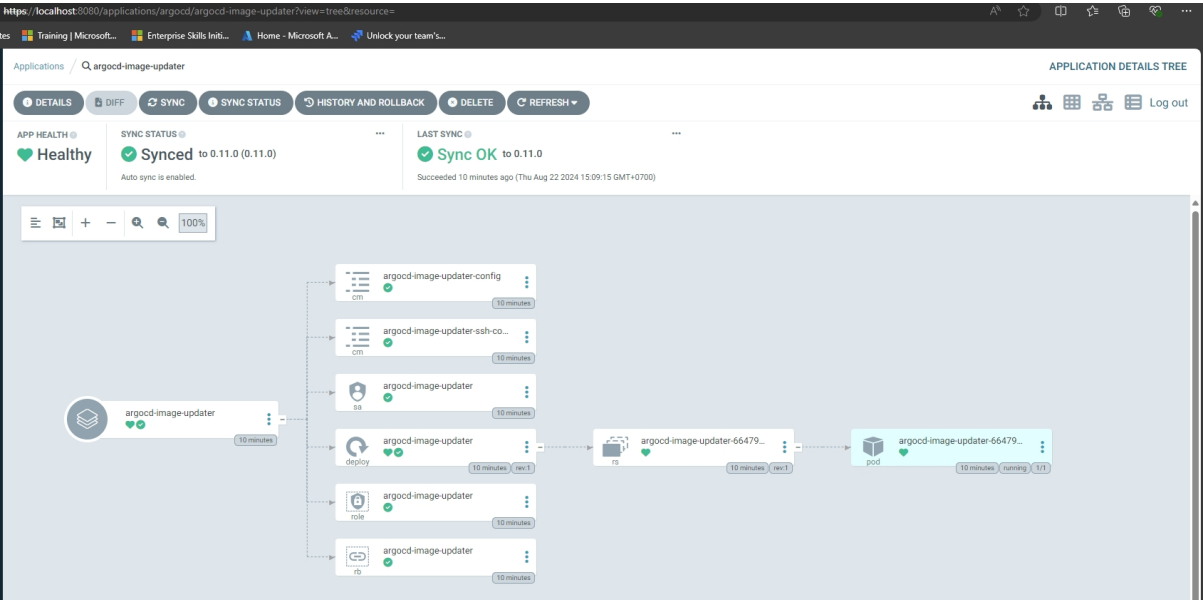
frontend-7497ff4647

backend-74b99d67f5-64wbm

frontend-7497ff4647-6q9Bs

Update image with ArgoCD Image Updater

Install ArgoCD Image Updater



SUMMARY	PARAMETERS	MANIFEST	EVENTS
ARGOCD-IMAGE-UPDATER			
PROJECT	default		
ANNOTATIONS			
CLUSTER	in-cluster (https://kubernetes.default.svc)		
NAMESPACE	argocd		
CREATED AT	08/22/2024 15:09:08 (11 minutes ago)		
REPO URL	https://argoproj.github.io/argo-helm		
CHART	argocd-image-updater:0.11.0		
SYNC OPTIONS			
RETRY OPTIONS	Retry disabled		
STATUS	Synced to 0.11.0 (0.11.0)		
HEALTH	Healthy		
LINKS			
IMAGES	quay.io/argoproj/argocd-image-updater:v0.14.0		

Marking application for image updatable

```
Jenkinsfile  wsl  ! backend.yaml  +  []  ...

# Please edit the object below. Lines beginning with a '#' will be ignored,
# and an empty file will abort the edit. If an error occurs while saving this file will be
# reopened with the relevant failures.
#
apiVersion: argoproj.io/v1alpha1
kind: Application
metadata:
  creationTimestamp: "2024-08-22T08:09:08Z"
  generation: 1824
  name: argocd-image-updater
  namespace: argocd
  resourceVersion: "9526194"
  uid: 4052d16a-f764-4481-8994-5af0c1b388ad
  annotations:
    argocd-image-updater.argoproj.io/image-list: 063439157700.dkr.ecr.ap-southeast-1.amazonaws.com/ntg-garage-backend,063439157700.dkr.ecr.ap-southeast-1.amazonaws.com/ntg-garage-frontend
spec:
  destination:
    namespace: argocd
    server: https://kubernetes.default.svc
    project: default
  source:
    chart: argocd-image-updater
    repoURL: https://argoproj.github.io/argo-helm
    targetRevision: 0.11.0
  syncPolicy:
    automated: {}
status:
  controllerNamespace: argocd
  health:
    status: Healthy
  history:
    - deployStartedAt: "2024-08-22T08:09:13Z"
      deployedAt: "2024-08-22T08:09:15Z"
      id: 0
      initiatedBy:
        automated: true
```


3. Setting up a CI/CD Pipeline and deploying applications on Azure AKS

Provision Azure resources

```
PS D:\training\Practical DevOps\infra\azure> tf_1.5.7.exe apply

Terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:
+ create

Terraform will perform the following actions:

# azurem_container_registry.acr will be created
+ resource "azurem_container_registry" "acr" {
  + admin_enabled           = true
  + admin_password          = (sensitive value)
  + admin_username          = (known after apply)
  + encryption              = (known after apply)
  + export_policy_enabled   = true
  + id                     = (known after apply)
  + location                = "southeastasia"
  + login_server            = (known after apply)
  + name                    = "practicalacr"
  + network_rule_bypass_option = "AzureServices"
  + network_rule_set        = (known after apply)
  + public_network_access_enabled = true
  + resource_group_name     = "practicaldevops-rg"
  + sku                     = "Basic"
  + trust_policy_enabled    = false
  + zone_redundancy_enabled = false
}

# azurem_kubernetes_cluster.aks will be created
+ resource "azurem_kubernetes_cluster" "aks" {
  + current_kubernetes_version = (known after apply)
  + dns_prefix                 = "practicalcluster"
  + fqdn                      = (known after apply)
  + http_application_routing_zone_name = (known after apply)
  + id                        = (known after apply)
  + kube_admin_config         = (sensitive value)
  + kube_admin_config_raw     = (sensitive value)
  + kube_config               = (sensitive value)
  + kube_config_raw           = (sensitive value)
  + kubernetes_version        = (known after apply)
  + location                  = "southeastasia"
  + name                      = "practicalcluster"
  + node_os_upgrade_channel   = "NodeImage"
  + node_resource_group       = (known after apply)
  + node_resource_group_id    = (known after apply)
  + oidc_issuer_url           = (known after apply)
  + portal_fqdn               = (known after apply)
  + private_cluster_enabled   = false
  + private_cluster_public_fqdn_enabled = false
  + private_dns_zone_id       = (known after apply)
  + private_fqdn              = (known after apply)
  + resource_group_name       = "practicaldevops-rg"
}
```

practicaldevops-rg

Search resources, services, and docs (G+)

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Cost Management

Monitoring

Automation

Help

Essentials

Subscription (move): Personal

Subscriptions ID: 2bfc4f68-1ccf-4a46-aa2e-42edbe39f930

Tags (edit): Add tags

Deployments: No deployments

Location: Southeast Asia

Resources

Filter for any field...

Type equals all

Location equals all

Add filter

Showing 1 to 3 of 3 records. Show hidden types

Name	Type	Location
practical-vnet	Virtual network	Southeast Asia
practicalacr	Container registry	Southeast Asia
practicalcluster	Kubernetes service	Southeast Asia

Create service connection for Azure Container Registry

New Docker Registry service connection ×

Registry type

☐ Docker Hub ☒ Others ☐ Azure Container Registry

Docker Registry

https://practicalacr.azurecr.io

Docker ID

practicalacr

Docker Password

.....

Email (optional)

Details

Service connection name

practicalacr

Description (optional)

Security

☐ Grant access permission to all pipelines

[Learn more](#)

[Troubleshoot](#)

Back

Save

Create service connection for Kubernetes cluster

New Kubernetes service connection



Authentication method

- ☒ KubeConfig
☐ Service Account
☐ Azure Subscription

KubeConfig

```
apiVersion: v1
clusters:
- cluster:
  certificate-authority-data:
```

Copy and paste the contents of your KubeConfig file

Cluster context (optional)

practicalcluster

☐ Accept untrusted certificates

Verify

✓ Verification Succeeded

Details

Service connection name

practicalcluster

Create deployment pipeline

quytranxuan / Practical DevOps / Pipelines / ntg-garage-backend / 20240826.2

PD

+

Build

Build and push image to ...

Initialize job

Checkout XQuyTran/sd...

Docker build and push

Post-job: Checkout X...

Finalize Job

Deploy

Deploy to AKS

Initialize job

Checkout XQuyTran/sd...

Deploy to AKS

Post-job: Checkout X...

Finalize Job

Jobs in run #20240826.2

ntg-garage-backend

Build

Build and push image to ...

Initialize job

Checkout XQuyTran/sd...

Docker build and push

Post-job: Checkout X...

Finalize Job

Deploy

Deploy to AKS

Initialize job

Checkout XQuyTran/sd...

Deploy to AKS

Post-job: Checkout X...

Finalize Job

✓ Deploy to AKS

1 Pool: [Azure Pipelines](#)

2 Image: ubuntu-latest

3 Agent: Hosted Agent

4 Started: Today at 5:57 PM

5 Duration: 7s



PD



← Jobs in run #20240826.1

ntg-garage-frontend

Build

✓ Build and push image ... 2m 9s

✓ Initialize job 1s

✓ Checkout XQuyTran/sd... 3s

✓ Docker build and p... 2m 4s

✓ Post-job: Checkout X... <1s

✓ Finalize Job <1s

Deploy

✓ Deploy to AKS 8s

✓ Initialize job 1s

✓ Checkout XQuyTran/sd... 3s

✓ Deploy to AKS 1s

✓ Post-job: Checkout X... <1s

✓ Finalize Job <1s



Deploy to AKS

- 1 Pool: [Azure Pipelines](#)
- 2 Image: [ubuntu-latest](#)
- 3 Agent: [Hosted Agent](#)
- 4 Started: Just now
- 5 Duration: 8s