

NOTE: Please consider PROJECT_1 Solution for the certification.

This Solution is just submitted including performed actions.

Problem Statement

A retail company Abstergo Corp. has recently setup an online shopping portal(website) to sell their products. Due to fierce competition, the company wants a solution that can reduce the time and effort it needs to enhance the functionality of their website on a regular basis. They are looking for an automated way to deploy the new code (for new features) to production website whenever they want.

Business Requirements

- The team of developers working on new features will merge their code to a GitHub repo.
- As soon as the code reaches GitHub, using a CI (Continuous Integration) pipeline, setup in Jenkins, automated builds will be triggered.
- The automated builds will frequently deploy new features to the production website.
- Every build will prepare a Dockerfile and push docker images to docker-hub.
- Every docker image will be deployed (Continuous Deployment) to a kubernetes-cluster.



Fork the given repository to your own account and use it as the application for your pipeline project

GitHub: <https://github.com/bhavukm/cicd-pipeline-train-schedule-autodeploy>

```

https://ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US...
ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US&project...
SSH-in-browser
UPLOAD FILE
DOWNLOAD FILE
root@instance-master:~# kubectl get nodes
NAME                                STATUS    ROLES    AGE    VERSION
gke-vagish-kubernetes-default-pool-cf69a8dc-76mk  Ready    <none>   38m   v1.24.9-gke.3200
gke-vagish-kubernetes-default-pool-cf69a8dc-u8v7  Ready    <none>   38m   v1.24.9-gke.3200
  
```

```
https://ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US...
ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US&project...

SSH-in-browser
[+] UPLOAD FILE [v] DOWNLOAD FILE [i] [c] [g]

root@instance-master:~# kubectl get nodes
NAME                                STATUS    ROLES    AGE   VERSION
gke-vagish-kubernetes-default-pool-cf69a8dc-76mk Ready    <none>   38m   v1.24.9-gke.3200
gke-vagish-kubernetes-default-pool-cf69a8dc-w8w7 Ready    <none>   38m   v1.24.9-gke.3200
root@instance-master:~# service jenkins status
jenkins.service - Jenkins Continuous Integration Server
   Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
   Active: active (running) since Sun 2023-03-19 15:02:12 UTC; 1min 43s ago
     Main PID: 125049 (java)
        Tasks: 46 (limit: 4691)
      Memory: 382.4M
         CPU: 26.005s
    CGroup: /system.slice/jenkins.service
            └─125049 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war --webroot=/var

Mar 19 15:02:09 instance-master jenkins[125049]: WARNING: Use --illegal-access=warn to enable warnings of fu
Mar 19 15:02:09 instance-master jenkins[125049]: WARNING: All illegal access operations will be denied in a
Mar 19 15:02:11 instance-master jenkins[125049]: 2023-03-19 15:02:11.079+0000 [id=13] INFO h.p
Mar 19 15:02:11 instance-master jenkins[125049]: 2023-03-19 15:02:11.809+0000 [id=32] INFO jenk
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Mar 19 15:02:11 instance-master jenkins[125049]: 2023-03-19 15:02:11.829+0000 [id=32] INFO jenk
Mar 19 15:02:11 instance-master jenkins[125049]: 2023-03-19 15:02:11.945+0000 [id=29] INFO jenk
Mar 19 15:02:12 instance-master jenkins[125049]: 2023-03-19 15:02:12.036+0000 [id=22] INFO hudo
Mar 19 15:02:12 instance-master systemd[1]: Started Jenkins Continuous Integration Server.

root@instance-master:~# curl ifconfig.me
35.200.236.221root@instance-master:~#
```

Cloud Shell interface showing the terminal output and browser tabs. The browser tabs include 'cicd-pipeline-train-schedule-aut...', 'vagish-kubernetes - Kubernetes', and 'Cloud Shell'. The address bar shows the URL: 'console.cloud.google.com/kubernetes/clusters/details/us-central1-a/vagish-kubernetes/details?cloudshell=false&project=edureka-handson'.

Google Cloud console interface showing the 'Kubernetes Engine' section. The left sidebar lists various services like Clusters, Workloads, Services & Ingress, Applications, Secrets & ConfigMaps, Storage, Object Browser, Migrate to Containers, Backup for GKE, Marketplace, and Release Notes. The main content area displays the 'vagish-kubernetes' cluster details, including a table of cluster basics and an automation section.

Cluster basics		
Name	vagish-kubernetes	🔒
Location type	Zonal	🔒
Control plane zone	us-central1-a	🔒
Default node zones	us-central1-a	✎
Release channel	Regular channel	✎ UPGRADE AVAILABLE
Version	1.24.9-gke.3200	
Total size	2	ⓘ
External endpoint	35.224.18.53	✎
	Show cluster certificate	
Internal endpoint	10.128.0.51	🔒
	Show cluster certificate	

Automation

Minikube window

```
https://ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US...
ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US&project...
SSH-in-browser
UPLOAD FILE
DOWNLOAD FILE

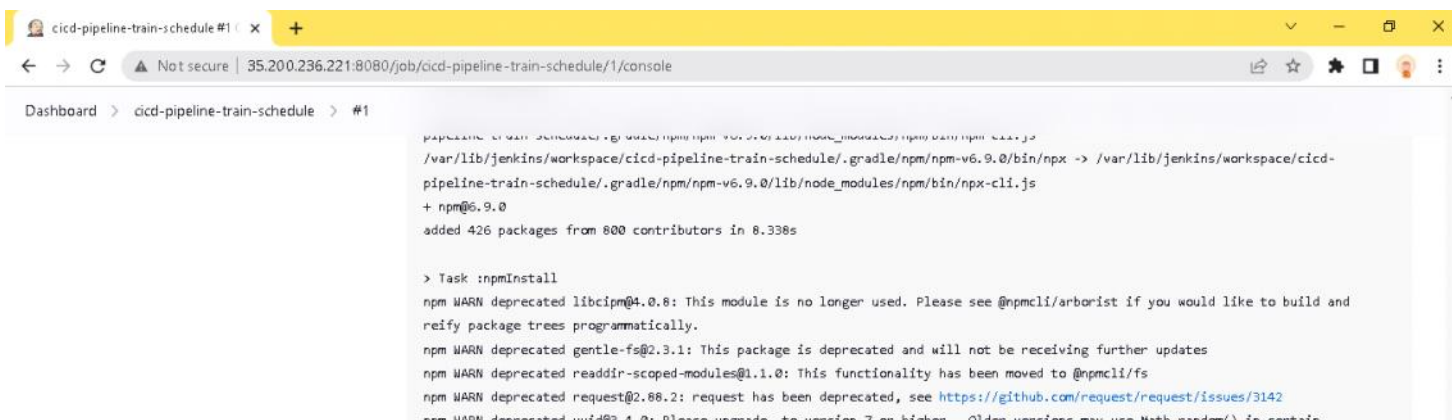
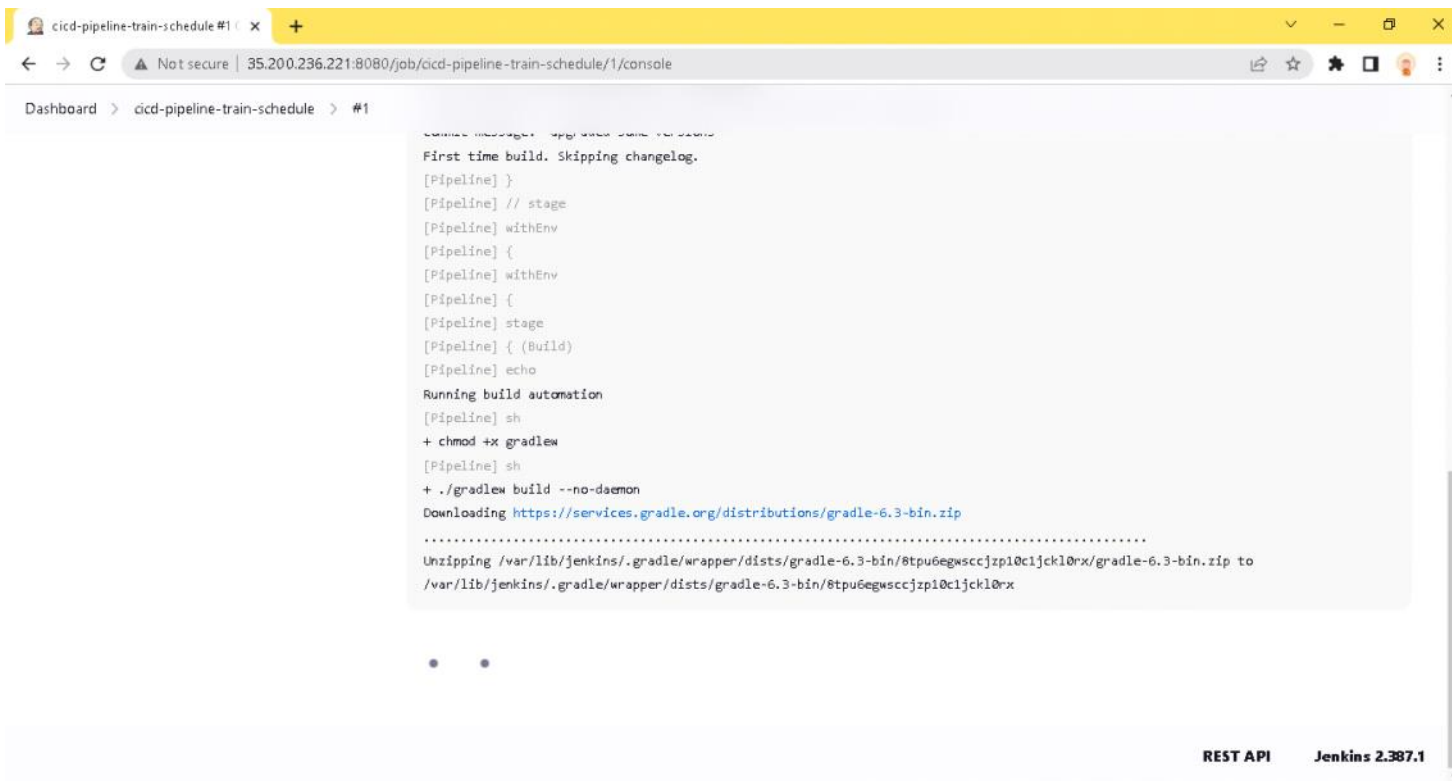
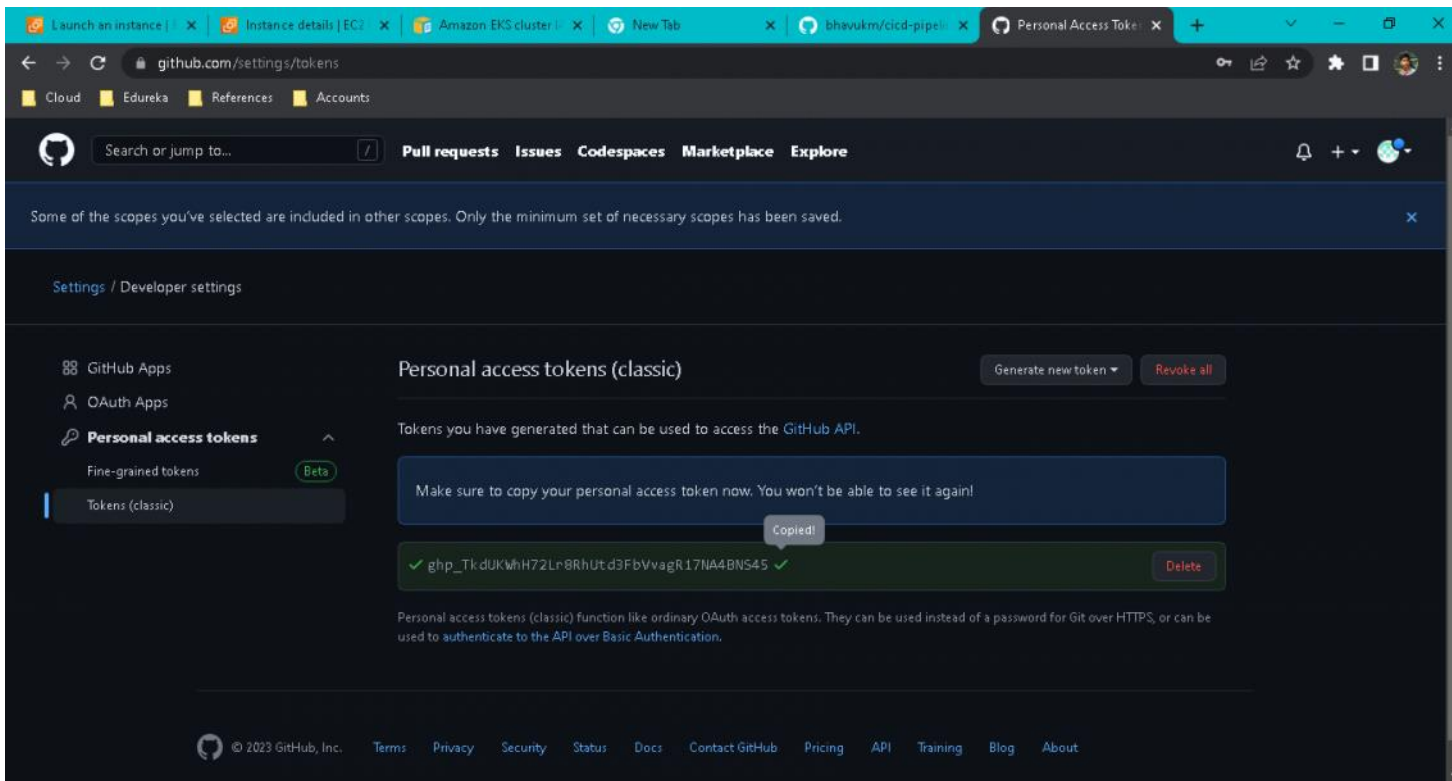
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NAME                                STATUS    ROLES    AGE   VERSION
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Mar 19 15:02:12 instance-master jenkins[125049]: 2023-03-19 15:02:12.036+0000 [id=22] INFO huds
Mar 19 15:02:12 instance-master systemd[1]: Started Jenkins Continuous Integration Server.

root@instance-master:~# curl ifconfig.me
35.200.236.221root@instance-master:~# gcloud container clusters get-credentials vagish-kubernetes --zone us-c
entrall1-a --project edureka-handson
Fetching cluster endpoint and auth data.
kubeconfig entry generated for vagish-kubernetes.
root@instance-master:~#
```

```
https://ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US...
ssh.cloud.google.com/v2/ssh/projects/edureka-handson/zones/asia-south1-a/instances/instance-master?authuser=0&hl=en_US&project...
SSH-in-browser
UPLOAD FILE
DOWNLOAD FILE

root@instance-master:~# kubectl get all -o wide
NAME                                TYPE          CLUSTER-IP    EXTERNAL-IP    PORT(S)    AGE   SELECTOR
service/kubernetes                  ClusterIP      10.112.0.1     <none>         443/TCP    41m   <none>
root@instance-master:~#
```



```
cid-pipeline-train-schedule #1 x +
← → ↻ Not secure | 35.200.236.221:8080/job/cid-pipeline-train-schedule/1/console
Dashboard > cid-pipeline-train-schedule > #1

papapapa: 35.200.236.221:8080/job/cid-pipeline-train-schedule/1/console
/var/lib/jenkins/workspace/cid-pipeline-train-schedule/.gradle/npm/npm-v6.9.0/bin/npx -> /var/lib/jenkins/workspace/cid-pipeline-train-schedule/.gradle/npm/npm-v6.9.0/lib/node_modules/npm/bin/npx-cli.js
+ npm@6.9.0
added 426 packages from 800 contributors in 8.338s

> Task :npmInstall
npm WARN deprecated libcipm@4.0.8: This module is no longer used. Please see @npmcli/arborist if you would like to build and reify package trees programmatically.
npm WARN deprecated gentle-fs@2.3.1: This package is deprecated and will not be receiving further updates
npm WARN deprecated readdir-scoped-modules@1.1.0: This functionality has been moved to @npmcli/fs
npm WARN deprecated request@2.88.2: request has been deprecated, see https://github.com/request/request/issues/3142
npm WARN deprecated uuid@3.4.0: Please upgrade to version 7 or higher. Older versions may use Math.random() in certain circumstances, which is known to be problematic. See https://v8.dev/blog/math-random for details.
npm WARN deprecated read-package-tree@5.3.1: The functionality that this package provided is now in @npmcli/arborist
npm WARN deprecated libnpmconfig@1.2.1: This module is not used anymore. npm config is parsed by npm itself and by @npmcli/config
npm WARN deprecated stringify-package@1.0.1: This module is not used anymore, and has been replaced by @npmcli/package-json
npm WARN deprecated har-validator@5.1.5: this library is no longer supported
npm WARN deprecated node-fetch-npm@2.0.4: This module is not used anymore, npm uses minipass-fetch for its fetch implementation now

REST API Jenkins 2.387.1
```

```
cid-pipeline-train-schedule #1 x +
← → ↻ Not secure | 35.200.236.221:8080/job/cid-pipeline-train-schedule/1/console
Dashboard > cid-pipeline-train-schedule > #1

> mocha

Index Page
GET / @32m200 @1m179.750 ms - 829@0m
✓ renders successfully (211ms)

Trains API
GET /trains @32m200 @1m2.261 ms - 1093@0m
✓ returns data successfully

2 passing (231ms)

> Task :npm_build
> Task :zip
> Task :build

Deprecated Gradle features were used in this build, making it incompatible with Gradle 7.0.
Use '--warning-mode all' to show the individual deprecation warnings.
See https://docs.gradle.org/6.3/userguide/command_line_interface.html#sec:command_line_warnings

BUILD SUCCESSFUL in 1m 5s
6 actionable tasks: 6 executed
[Pipeline] archiveArtifacts
Archiving artifacts
```


The screenshot shows the Jenkins web interface for a pipeline named "cicd-pipeline-train-schedule". The "Pipeline View" tab is active, displaying a summary of the pipeline's execution. The left-hand navigation menu includes links for Status, Changes, Build Now, Configure, Delete Pipeline, Full Stage View, GitHub, Stages, Rename, Pipeline Syntax, and GitHub Hook Log. The main content area features a "Last Successful Artifacts" section showing a file named "trainSchedule.zip" (10.36 MB) with a view icon. Below this is the "Stage View" section, which contains a table summarizing the stages and their average run times.

	Declarative: Checkout SCM	Build	Build Docker Image	Push Docker Image	CanaryDeploy	DeployToProduction
Average stage times: (Average full run time: ~1min 18s)	1s	1min 6s	0ms	0ms	0ms	0ms
#1 Mar 19 22:39 No Changes	1s	1 min 6s				

```
cid-pipeline-train-schedule #8 x +
Not secure | 35.200.236.221:8080/job/cid-pipeline-train-schedule/8/console
Dashboard > cid-pipeline-train-schedule > #8

[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Build Docker Image)
[Pipeline] script
[Pipeline] {
[Pipeline] sh
+ sudo docker build -t vagish999/train-schedule .
Sending build context to Docker daemon 3.143MB

Step 1/7 : FROM node:carbon
--> 8eeadf3757f4
Step 2/7 : WORKDIR /usr/src/app
--> Using cache
--> 837c22680d33
Step 3/7 : COPY package*.json ./
--> Using cache
--> abd960cd3a23
Step 4/7 : RUN npm install
--> Using cache
--> 543454f1bfa0
Step 5/7 : COPY . .
--> a5ffc30b5cb2
Step 6/7 : EXPOSE 8080
--> Running in 1d189a0eefaa
Removing intermediate container 1d189a0eefaa
--> d6102ef44181
Step 7/7 : CMD [ "npm", "start" ]
```

```
cid-pipeline-train-schedule #12 x +
Not secure | 35.200.236.221:8080/job/cid-pipeline-train-schedule/12/console
Dashboard > cid-pipeline-train-schedule > #12

Step 5/7 : COPY . .
--> c81ba1e3ba09
Step 6/7 : EXPOSE 8080
--> Running in 13d0316b406c
Removing intermediate container 13d0316b406c
--> f6bcb0b27f14
Step 7/7 : CMD [ "npm", "start" ]
--> Running in a73d52d2ee67
Removing intermediate container a73d52d2ee67
--> ff0969f5c145
Successfully built ff0969f5c145
Successfully tagged vagish999/train-schedule:latest
[Pipeline] sh
+ sudo docker run --name temp_container vagish999/train-schedule sh -c echo Hello, World!
Hello, World!
[Pipeline] sh
+ sudo docker commit temp_container vagish999/train-schedule
sha256:67fcaaa734fd72474acc6972bd5f140b21ba9796eb8f59c8a7a4fe5cc9b9a814
[Pipeline] sh
+ sudo docker rm temp_container
temp_container
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Push Docker Image)
[Pipeline] sh
+ sudo docker login -u vagish999 -p Kakashi@111
WARNING! Using --password via the CLI is insecure. Use --password-stdin
```

```
cicd-pipeline-train-schedule #12 x +
Not secure | 35.200.236.221:8080/job/cicd-pipeline-train-schedule/12/console
Dashboard > cicd-pipeline-train-schedule > #12

WARNING: Using --password via the CLI is insecure. Use --password-stdin.
WARNING: Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
[Pipeline] sh
+ sudo docker tag vagish999/train-schedule:latest vagish999/vagish999/train-schedule:1
[Pipeline] sh
+ sudo docker tag vagish999/train-schedule:latest vagish999/vagish999/train-schedule:latest
[Pipeline] sh
+ sudo docker push vagish999/vagish999/train-schedule:1
The push refers to repository [docker.io/vagish999/vagish999/train-schedule]
69cf02053999: Preparing
bde522f0c68c: Preparing
1fd243079361: Preparing
70abe812cd63: Preparing
423451ed44f2: Preparing
b2aaf85d6633: Preparing
88601a85cell: Preparing
42f9c2f9c08e: Preparing
99e8bd3efaaf: Preparing
bee1e39d7c3a: Preparing
1f59a4b2e206: Preparing
0ca7f54856c0: Preparing
ebb9ae013834: Preparing
b2aaf85d6633: Waiting
88601a85cell: Waiting
```

```
cicd-pipeline-train-schedule #13 x +
Not secure | 35.200.236.221:8080/job/cicd-pipeline-train-schedule/13/console
Dashboard > cicd-pipeline-train-schedule > #13

423451ed44f2: Preparing
b2aaf85d6633: Preparing
88601a85cell: Preparing
42f9c2f9c08e: Preparing
99e8bd3efaaf: Preparing
bee1e39d7c3a: Preparing
1f59a4b2e206: Preparing
0ca7f54856c0: Preparing
ebb9ae013834: Preparing
b2aaf85d6633: Waiting
88601a85cell: Waiting
42f9c2f9c08e: Waiting
99e8bd3efaaf: Waiting
bee1e39d7c3a: Waiting
1f59a4b2e206: Waiting
0ca7f54856c0: Waiting
ebb9ae013834: Waiting
423451ed44f2: Pushed
70abe812cd63: Pushed
1fd243079361: Pushed
a8dc3fd3954f: Pushed
42f9c2f9c08e: Pushed
b2aaf85d6633: Pushed
bde522f0c68c: Pushed
```


Dashboard > cicd-pipeline-train-schedule > #18

```
[Pipeline] stage
[Pipeline] { (CanaryDeploy)
[Pipeline] withEnv
[Pipeline] {
[Pipeline] sh
+ sudo kubectl apply -f train-schedule-kube-canary.yml
service/train-schedule-service-canary unchanged
deployment.apps/train-schedule-deployment-canary created
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (DeployToProduction)
[Pipeline] withEnv
[Pipeline] {
[Pipeline] input
Deploy to Production?
Proceed or Abort
```

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Dashboard > cicd-pipeline-train-schedule > #18

```
[Pipeline] input
Deploy to Production?
Proceed or Abort
Approved by Vagish Jaiswal
[Pipeline] milestone
Trying to pass milestone 1
[Pipeline] sh
+ sudo kubectl apply -f train-schedule-kube-canary.yml
service/train-schedule-service-canary unchanged
deployment.apps/train-schedule-deployment-canary unchanged
[Pipeline] sh
+ sudo kubectl apply -f train-schedule-kube.yml
service/train-schedule-service created
deployment.apps/train-schedule-deployment created
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

[illegible]

Find your train!

Select your train below to see its current schedule.

Trains

[Flying Scotsman](#) [Golden Arrow](#) [Hogwarts Express](#) [Orient Express](#)

Select a train to view its current schedule.

Find your train!

Select your train below to see its current schedule.

Trains

[Flying Scotsman](#) [Golden Arrow](#) [Hogwarts Express](#) [Orient Express](#)

Hogwarts Express

Station			
Sycamore	ON-TIME	Arrives 12:00pm	Departs 12:10pm
Pine	ON-TIME	Arrives 1:00pm	Departs 1:10pm

35.200.236.221:30009/#

Uploaded PDF with consolidated Screenshots.