

Problem Statement II

1. Set up Jenkins Environment

Jenkins master server setup:

```
root@jenkins-m:~# jenkins --version
2.479.2
root@jenkins-m:~# java --version
openjdk 17.0.13 2024-10-15
OpenJDK Runtime Environment (build 17.0.13+11-Ubuntu-2ubuntu120.04)
OpenJDK 64-Bit Server VM (build 17.0.13+11-Ubuntu-2ubuntu120.04, mixed mode, sharing)
root@jenkins-m:~# ansible --version
ansible [core 2.12.10]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/
plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Nov  7 2024, 13:10:47) [GCC 9.4.0]
  jinja version = 2.10.1
  libyaml = True
root@jenkins-m:~# git --version
git version 2.25.1
root@jenkins-m:~#
```

The screenshot shows the Jenkins Dashboard interface. At the top, there's a header with the Jenkins logo, a search bar, and user information (sham chaudhari). Below the header, the 'Dashboard' section is visible. On the left, there's a sidebar with links to 'New Item', 'Build History', 'Manage Jenkins', 'My Views', and 'Open Blue Ocean'. The main content area displays a table of build history for the 'CI/CD-Pipeline' job. The table has columns for 'S' (Success), 'W' (Warning), 'Name', 'Last Success', 'Last Failure', 'Last Duration', and 'F' (Fail). The current build is shown as a success with a green play button icon. Below the table, there's a 'Build Queue' section showing 'No builds in the queue.' and a 'Build Executor Status' section showing '0/2' executors.

| S | W | Name | Last Success | Last Failure | Last Duration | F |
|-----|-----|----------------|--------------|--------------|---------------|-----|
| ... | ... | CI/CD-Pipeline | N/A | N/A | N/A | ... |

2. Kubernetes cluster set up for deploying images.

Setup Kubernetes master:

```
root@kube-master:~# docker -v
Docker version 27.4.1, build b9d17ea
root@kube-master:~# cri-dockerd --version
cri-dockerd 0.3.4 (e88b1605)
root@kube-master:~# kubeadm version -o short
v1.29.12
root@kube-master:~# kubelet --version
Kubernetes v1.29.12
root@kube-master:~# kubectl version --client
Client Version: v1.29.12
Kustomize Version: v5.0.4-0.20230601165947-6ce0bf390ce3
root@kube-master:~#
```

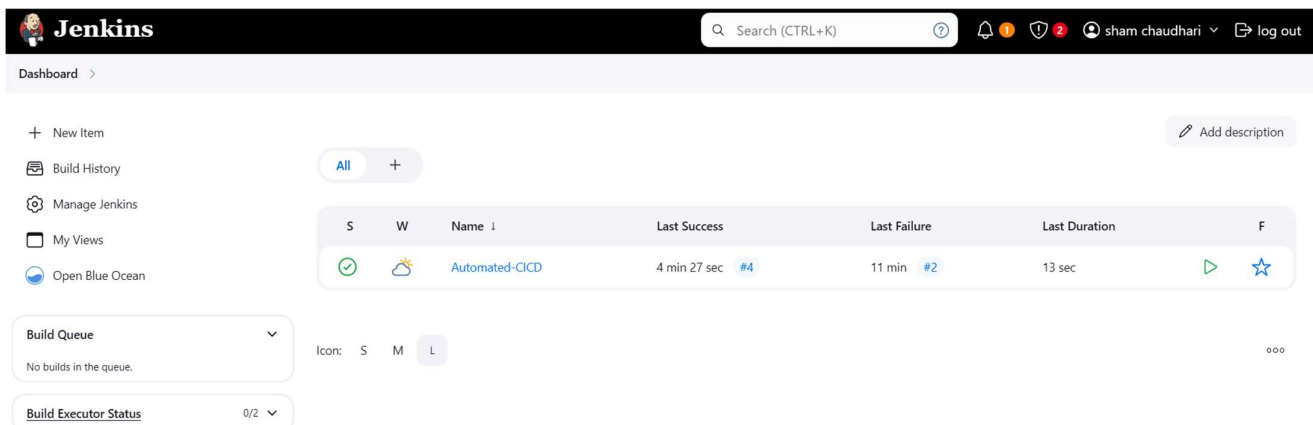
Setup worker node:

```
root@node1:~# docker -v
Docker version 27.4.1, build b9d17ea
root@node1:~# cri-dockerd --version
cri-dockerd: command not found
root@node1:~# kubeadm version -o short
v1.29.12
root@node1:~# kubelet --version
Kubernetes v1.29.12
root@node1:~# kubectl version --client
Client Version: v1.29.12
Kustomize Version: v5.0.4-0.20230601165947-6ce0bf390ce3
root@node1:~#
```

Connect worker node to master:

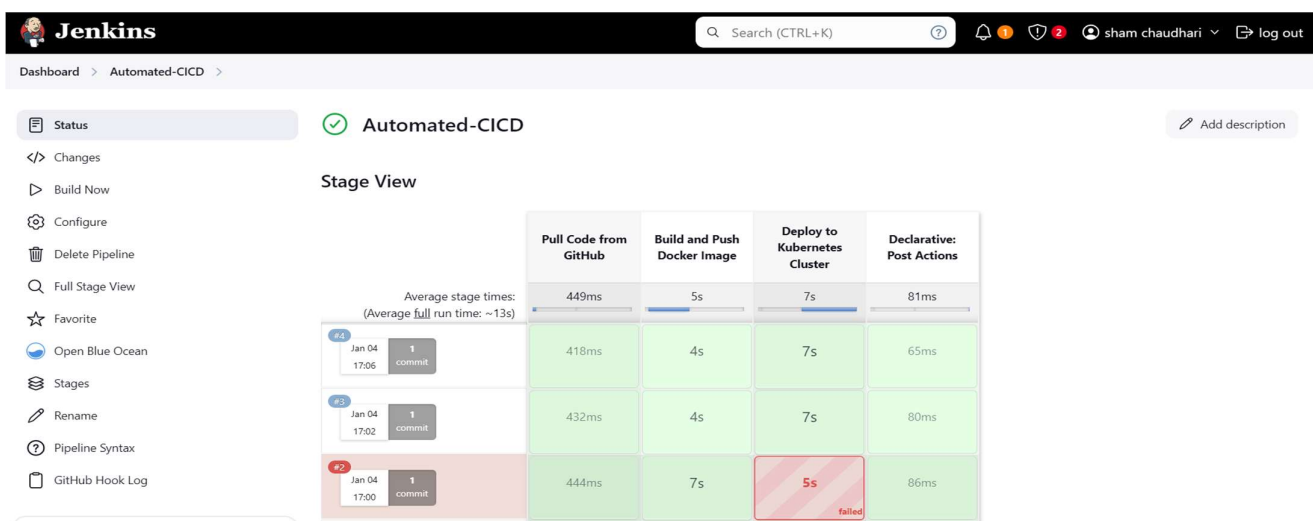
```
root@kubernetes-master:~# kubectl get node
NAME          STATUS    ROLES          AGE      VERSION
kubernetes-master Ready    control-plane   21m      v1.29.12
node1         Ready    <none>          4m41s    v1.29.12
root@kubernetes-master:~#
```

3. Create automated CICD pipeline




The screenshot shows the Jenkins Dashboard. At the top, there's a search bar and user information for 'sham chaudhari'. The main area displays a table of builds for the 'Automated-CICD' job. The table has columns for 'S' (Success), 'W' (Warning), 'Name', 'Last Success', 'Last Failure', 'Last Duration', and 'F' (Favorite). The 'Automated-CICD' job is listed with a success status, a duration of 4 min 27 sec, and a last failure of 11 min. Below the table, there are sections for 'Build Queue' (No builds in the queue) and 'Build Executor Status' (0/2).

| S | W | Name | Last Success | Last Failure | Last Duration | F |
|---|---|----------------|-----------------|--------------|---------------|-----|
| ✓ | | Automated-CICD | 4 min 27 sec #4 | 11 min #2 | 13 sec | ▶ ☆ |







The screenshot shows the Jenkins Pipeline View for the 'Automated-CICD' job. The pipeline is visualized as a series of stages: 'Pull Code from GitHub', 'Build and Push Docker Image', 'Deploy to Kubernetes Cluster', and 'Declarative: Post Actions'. The pipeline is currently in a 'failed' state, indicated by a red 'failed' label. The 'Average stage times' are shown as 449ms, 5s, 7s, and 81ms respectively. The 'Average full run time' is ~13s. The pipeline is currently running on a node named 'node1' with a commit hash of '1 commit'.

| Stage | Pull Code from GitHub | Build and Push Docker Image | Deploy to Kubernetes Cluster | Declarative: Post Actions |
|--------------|-----------------------|-----------------------------|------------------------------|---------------------------|
| Jan 04 17:06 | 418ms | 4s | 7s | 65ms |
| Jan 04 17:02 | 432ms | 4s | 7s | 80ms |
| Jan 04 17:00 | 444ms | 7s | 5s failed | 86ms |

**Jenkins**

Search (CTRL+K)

   sham chaudhari  log out

Dashboard > Automated-CICD > #4

Status

Changes

Console Output

Edit Build Information

Delete build '#4'

Polling Log


Timings

Git Build Data

Open Blue Ocean


Pipeline Overview

Pipeline Console

 **#4 (Jan 4, 2025, 11:36:45 AM)**


Add description

Keep this build forever


 Started by GitHub push by sham9394

Started 5 min 22 sec ago

Took 13 sec


 This run spent:

- 6.9 sec waiting;
- 13 sec build duration;
- 20 sec total from scheduled to completion.


 **Revision:** 9721a991b8064d3ca45de95e2be446bbc86b8562

Repository: <https://github.com/sham9394/cicd-pipeline-jenkins-complete.git>





- refs/remotes/origin/master

 Changes


- 1. Update deploy-kube.yml ([details](#) / [githubweb](#))

**Jenkins**

Search (CTRL+K)

   sham chaudhari  log out

Dashboard > Automated-CICD > #4 > Pipeline Console

 < **Build #4**


Rebuild


Overview


Configure


...

Success 6 min 4 sec ago in 13 sec


 Pull Code from GitHub


 Build and Push Docker Image


 Deploy to Kubernetes Cluster


 **Post Actions**

Stage 'Post Actions'


 Started 5 min 52 sec ago

 Queued 0 ms

 Took 48 ms




 Success


[View as plain text](#)

 **Pipeline execution completed.**

Print Message




15 ms


 **Pipeline executed successfully.**

Print Message





11 ms

0 Pipeline executed successfully.

**Jenkins**

Search (CTRL+K)

   sham chaudhari  log out

Dashboard > Automated-CICD > Stages

Build Automated-CICD

Build

Configure

id

pipeline

#4


Start Pull Code from ... Build and Push ... Deploy to Kuber... Post Actions End

#3





Start Pull Code from ... Build and Push ... Deploy to Kuber... Post Actions End

#2

Start Pull Code from ... Build and Push ... Deploy to Kuber... Post Actions End

**Jenkins**

Search (CTRL+K)

   sham chaudhari  log out

Dashboard > Automated-CICD > #4 > Polling Log

Status

Changes

Console Output

Edit Build Information

Delete build '#4'

Polling Log

View as plain text

Timings

Git Build Data

Open Blue Ocean

Pipeline Overview

Polling Log

This page captures the polling log that triggered this build.

Started on Jan 4, 2025, 11:36:38 AM

Started by event from 140.82.115.59 => <http://34.136.26.197:8080/github-webhook/> on Sat Jan 04 11:36:38 UTC 2025

Using strategy: Default

[poll] Last Built Revision: Revision aa40fa09eafe8c4a112922de2b02e3bc8be66b2 (refs/remotes/origin/master)

The recommended git tool is: NONE

No credentials specified

> git --version # timeout=10

> git --version # 'git version 2.25.1'

> git ls-remote -h -- <https://github.com/sham9394/cicd-pipeline-jenkins-complete.git> # timeout=10

Found 1 remote heads on <https://github.com/sham9394/cicd-pipeline-jenkins-complete.git>

[poll] Latest remote head revision on refs/heads/master is: 9721a991b8064d3ca45de95e2be446bbc86b8562

Done. Took 0.16 sec

changes found

4. Verify on Kubernetes master VM:

```
root@kubernetes-master:~# kubectl get pods -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP              NODE   NOMINATED NODE   READINESS GATES
train-schedule-deployment-69f5999dc6-8ptg8    1/1     Running   0          8m49s  192.168.166.172  node1   <none>           <none>
train-schedule-deployment-69f5999dc6-hwn9h    1/1     Running   0          8m49s  192.168.166.171  node1   <none>           <none>
train-schedule-deployment-canary-566d6d9685-6sk9s  1/1     Running   0          8m50s  192.168.166.170  node1   <none>           <none>
train-schedule-deployment-canary-566d6d9685-thqtv  1/1     Running   0          8m50s  192.168.166.169  node1   <none>           <none>
root@kubernetes-master:~# kubectl get node -o wide
NAME      STATUS    ROLES          AGE   VERSION   INTERNAL-IP   EXTERNAL-IP   OS-IMAGE             KERNEL-VERSION   CONTAINER-RUNTIME
kubernetes-master  Ready    control-plane  5h32m  v1.29.12  10.128.0.26   <none>        Ubuntu 20.04.6 LTS   5.15.0-1073-gcp  docker://27.4.1
node1      Ready    <none>         5h16m  v1.29.12  10.128.0.27   <none>        Ubuntu 20.04.6 LTS   5.15.0-1073-gcp  docker://27.4.1
root@kubernetes-master:~# kubectl get deployment -o wide
NAME                                READY   UP-TO-DATE   AVAILABLE   AGE   CONTAINERS   IMAGES                               SELECTOR
train-schedule-deployment           2/2     2             2           10m   train-schedule  sham9394/train-schedule:4   app=train-schedule,track=stable
train-schedule-deployment-canary    2/2     2             2           10m   train-schedule  sham9394/train-schedule:4   app=train-schedule,track=canary
root@kubernetes-master:~# kubectl get svc -o wide
NAME      TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE   SELECTOR
kubernetes  ClusterIP   10.96.0.1     <none>        443/TCP          5h33m  <none>
train-schedule-service  NodePort    10.106.206.180  <none>        8080:30002/TCP   40m   app=train-schedule
train-schedule-service-canary  NodePort    10.108.240.152  <none>        8080:30001/TCP   48m   app=train-schedule,track=canary
root@kubernetes-master:~#
```