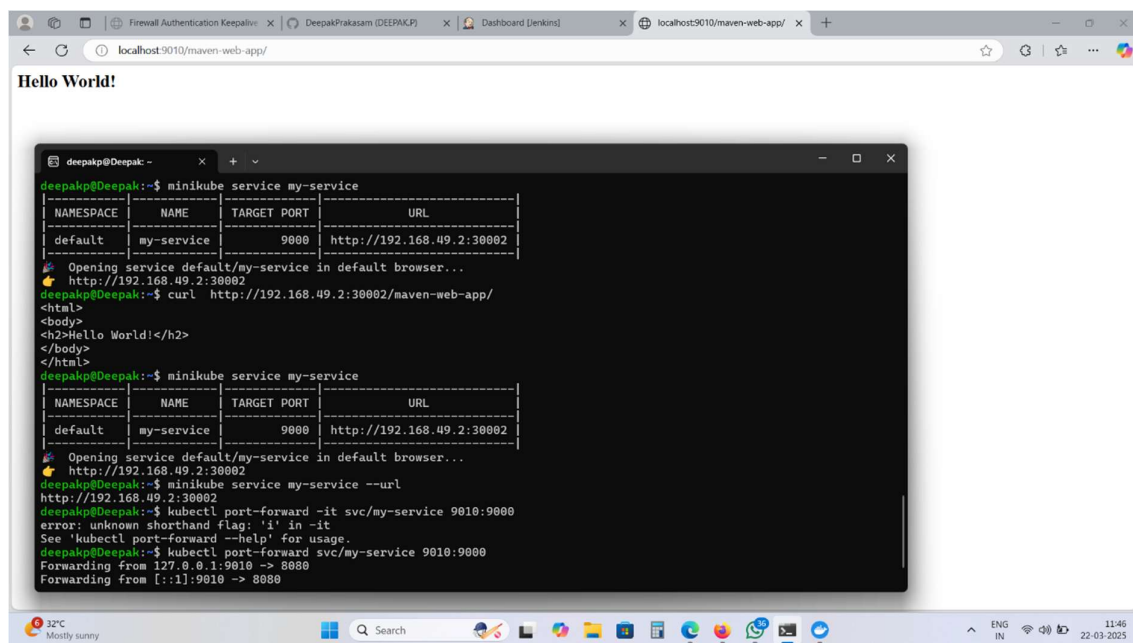


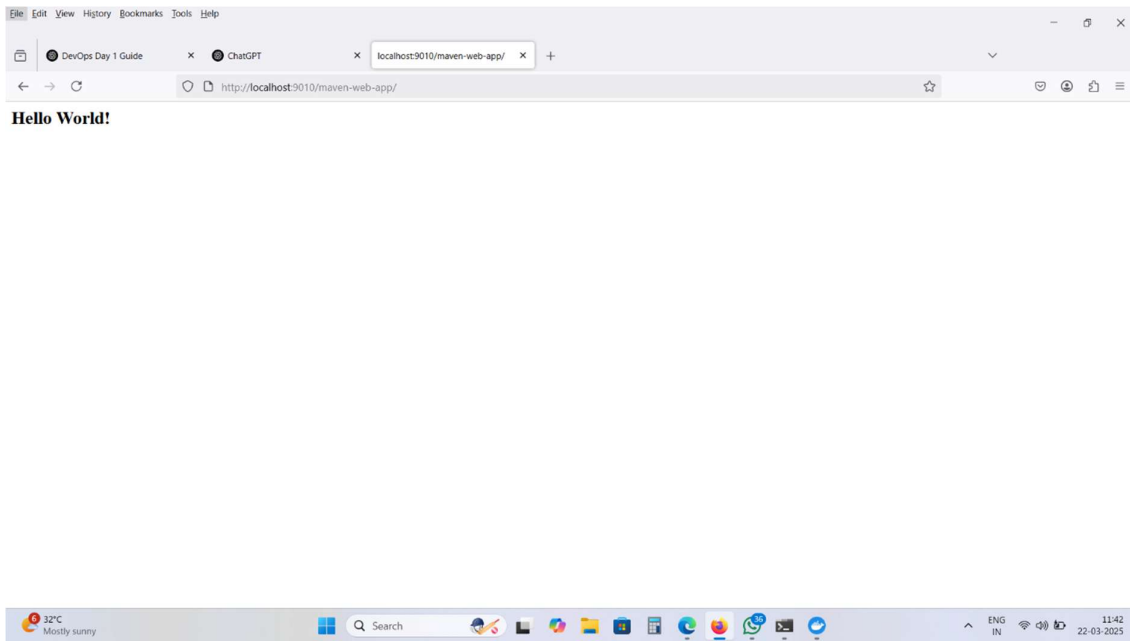
# Day 6 Task: Final Java Project Minikube Deployment

## Minikube output images

```
deepakp@Deepak: ~$ minikube service my-service
NAMESPACE | NAME | TARGET PORT | URL
default | my-service | 9000 | http://192.168.49.2:30002
Opening service default/my-service in default browser...
http://192.168.49.2:30002
deepakp@Deepak: ~$ kubectl get pod
NAME | READY | STATUS | RESTARTS | AGE
my-deploy-d555f5bb4-mhwh | 1/1 | Running | 0 | 4m13s
deepakp@Deepak: ~$ minikube service my-service
NAMESPACE | NAME | TARGET PORT | URL
default | my-service | 9000 | http://192.168.49.2:30002
Opening service default/my-service in default browser...
http://192.168.49.2:30002
deepakp@Deepak: ~$ curl http://192.168.49.2:30002/maven-web-app/
<html>
<body>
<h2>Hello World!</h2>
</body>
</html>
deepakp@Deepak: ~$ minikube service my-service
NAMESPACE | NAME | TARGET PORT | URL
default | my-service | 9000 | http://192.168.49.2:30002
Opening service default/my-service in default browser...
http://192.168.49.2:30002
deepakp@Deepak: ~$ minikube service my-service --url
http://192.168.49.2:30002
deepakp@Deepak: ~$ kubectl port-forward -it svc/my-service 9010:9000
error: unknown shorthand flag: 'i' in -it
See 'kubectl port-forward --help' for usage.
deepakp@Deepak: ~$ kubectl port-forward svc/my-service 9010:9000
Forwarding from 127.0.0.1:9010 -> 8080
Forwarding from [::1]:9010 -> 8080
```

```
deepakp@Deepak: ~$ minikube service my-service
NAMESPACE | NAME | TARGET PORT | URL
default | my-service | 9000 | http://192.168.49.2:30002
Opening service default/my-service in default browser...
http://192.168.49.2:30002
deepakp@Deepak: ~$ curl http://192.168.49.2:30002/maven-web-app/
<html>
<body>
<h2>Hello World!</h2>
</body>
</html>
```



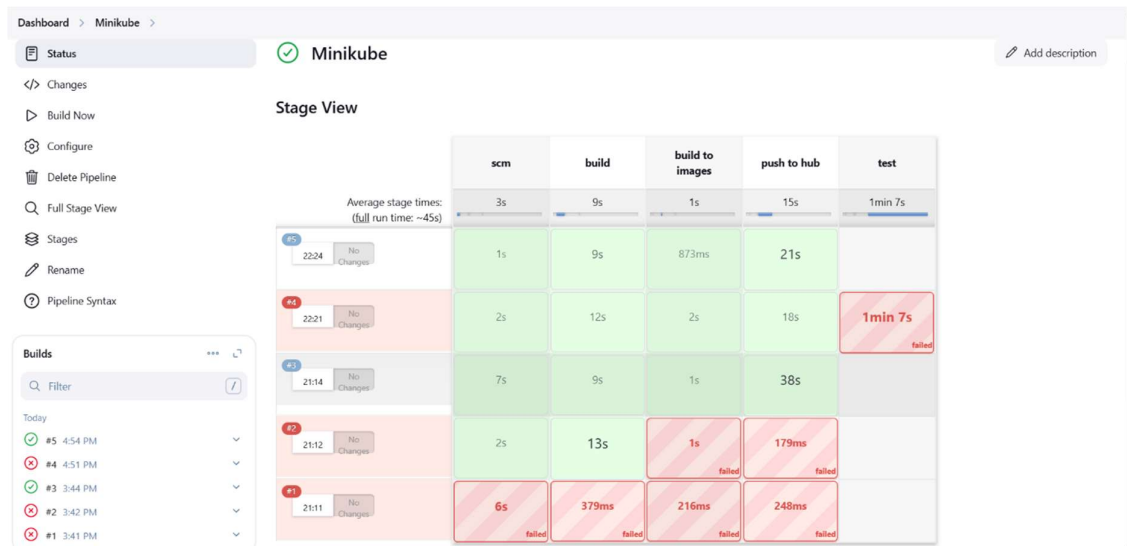


## *Minikube console output*

A screenshot of the Jenkins web interface. The top navigation bar shows 'Jenkins' and a user profile 'Deepak P'. The breadcrumb trail is 'Dashboard > Minikube > #3'. The left sidebar contains a list of links: 'Status', '</> Changes', 'Console Output' (which is highlighted), 'Edit Build Information', 'Timings', 'Pipeline Overview', 'Pipeline Console', 'Thread Dump', 'Pause/resume', 'Replay', 'Pipeline Steps', 'Workspaces', and 'Previous Build'. The main content area is titled 'Console Output' with a green checkmark icon. It includes buttons for 'Download', 'Copy', and 'View as plain text'. The console output text is as follows:

```
Started by user Deepak P
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in /var/lib/jenkins/workspace/Minikube
[Pipeline] {
[Pipeline] stage
[Pipeline] { (scm)
[Pipeline] git
Selected Git installation does not exist. Using Default
The recommended git tool is: NONE
No credentials specified
> git rev-parse --resolve-git-dir /var/lib/jenkins/workspace/Minikube/.git # timeout=10
Fetching changes from the remote Git repository
> git config remote.origin.url https://github.com/DeepakPrakasam/Jenkins-Devops.git # timeout=10
Fetching upstream changes from https://github.com/DeepakPrakasam/Jenkins-Devops.git
> git --version # timeout=10
> git --version # 'git version 2.43.0'
> git fetch --tags --force --progress -- https://github.com/DeepakPrakasam/Jenkins-Devops.git +refs/heads/*:refs/remotes/origin/* #
timeout=10
> git rev-parse refs/remotes/origin/master^{commit} # timeout=10
Checking out Revision 3cd3d100cd03cd39044fc3e03ed63631f8fe1bc (refs/remotes/origin/master)
> git config core.sparsecheckout # timeout=10
> git checkout -f 3cd3d100cd03cd39044fc3e03ed63631f8fe1bc # timeout=10
```

### *Minikube stage view output*



### *SSH-service output*

[illegible]

## ***Deployment and Service yaml code***

*apiVersion: apps/v1*

*kind: Deployment*

*metadata:*

*name: my-deploy*

*labels:*

*name: my-deploy*

*spec:*

*replicas: 1*

*selector:*

*matchLabels:*

*apptype: web-backend*

*strategy:*

*type: RollingUpdate*

*template:*

*metadata:*

*labels:*

*apptype: web-backend*

*spec:*

*containers:*

*- name: maven-web-app*

*image: deepakp2003/simplewebapp:latest # <-- Fixed: Added  
valid image name*

*ports:*

*- containerPort: 9000 # <-- This should match `targetPort` in the service*

*---*

*apiVersion: v1*

*kind: Service*

*metadata:*

*name: my-service*

*labels:*

*app: my-service*

*spec:*

*type: NodePort*

*ports:*

*- port: 9000*

*targetPort: 8080 # <-- Fixed: Matching the Deployment's `containerPort`*

*nodePort: 30002*

*selector:*

*apptype: web-backend*

## *Jenkins Pipeline Script and Breakdown:*



```
pipeline {
  agent any

  stages {
    // SCM Stage: Checkout the code from the Git repository
    stage('scm') {
      steps {
        git url: 'https://github.com/DeepakPrakasam/Jenkins-Devops.git'
      }
    }
  }

  // Build Stage: Maven build steps
  stage('build') {
    steps {
      sh "mvn clean"
      sh "mvn install"
    }
  }
}
```

*// Docker Image Build Stage*

```
stage('build to images') {  
    steps {  
        script {  
            sh 'docker build -t deepakp2003/simpleapplication .'        }  
    }  
}
```

*// Push Docker Image to Docker Hub*

```
stage('push to hub') {  
    steps {  
        script {  
            withDockerRegistry(credentialsId: 'Deepak_Docker_Cred', url:  
'https://index.docker.io/v1/') {  
                sh 'docker push deepakp2003/simpleapplication'  
            }  
        }  
    }  
}
```

*// Test/Deploy Stage (Uncommented)*

```
stage('test') {  
    steps {  
        withKubeConfig(caCertificate: '', clusterName: '', contextName: '',  
credentialsId: 'minikube', namespace: '', restrictKubeConfigAccess: false,  
serverUrl: 'https://192.168.39.226:8443') {
```

*sh 'kubectl apply -f deployment.yml --validate=false'*

```
}  
}  
}  
}  
}
```

## Prometheus and Node Exporter Setup

```
deepakp@Deepak:~$ kubectl delete all --all  
pod "my-deploy-d555f3bb4-mhwh" deleted  
service "kubernetes" deleted  
service "my-service" deleted  
deployment.apps "my-deploy" deleted  
deepakp@Deepak:~$ sudo useradd \  
--system \  
--no-create-home \  
--shell /bin/false prometheus  
[sudo] password for deepakp:  
useradd: Warning: missing or non-executable shell '/bin/false prometheus'  
Usage: useradd [options] LOGIN  
        useradd -D  
        useradd -D [options]  
  
Options:  
-b, --base-dir BASE_DIR      base directory for the home directory of the  
                             new account  
-c, --comment COMMENT       use BTRFS subvolume for home directory  
                             GECOS field of the new account  
-d, --home-dir HOME_DIR     home directory of the new account  
-D, --defaults               print or change default useradd configuration  
-e, --expiredate EXPIRE_DATE expiration date of the new account  
-f, --inactive INACTIVE     password inactivity period of the new account  
-F, --add-subids-for-system  add entries to sub[uid]id even when adding a system user  
-g, --gid GROUP              name or ID of the primary group of the new  
                             account  
-G, --groups GROUPS         list of supplementary groups of the new  
                             account  
-h, --help                  display this help message and exit  
-k, --skel SKEL_DIR         use this alternative skeleton directory  
-K, --key KEY=VALUE         override /etc/login.defs defaults  
-l, --no-log-init            do not add the user to the lastlog and  
                             faillog databases  
-m, --create-home           create the user's home directory  
-M, --no-create-home        do not create the user's home directory  
-N, --no-user-group         do not create a group with the same name as  
                             the user  
-o, --non-unique            allow to create users with duplicate  
                             (non-unique) UID
```

```
deepakp@Deepak:~$ wget https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-2.47.1.linux-amd64.tar.gz  
tar -xvf prometheus-2.47.1.linux-amd64.tar.gz  
sudo mkdir -p /data /etc/prometheus  
cd prometheus-2.47.1.linux-amd64/  
sudo mv prometheus promtool /usr/local/bin/  
sudo mv consoles/ console.libraries/ /etc/prometheus/  
sudo mv prometheus.yml /etc/prometheus/prometheus.yml  
sudo chown -R prometheus:prometheus /etc/prometheus/ /data/  
--2025-03-22 06:31:41-- https://github.com/prometheus/prometheus/releases/download/v2.47.1/prometheus-2.47.1.linux-amd64.tar.gz  
Resolving github.com (github.com)... 20.207.73.82  
Connecting to github.com (github.com)[20.207.73.82]:443... connected.  
HTTP request sent, awaiting response... 302 Found  
Location: https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/2f9b7b37-63a0-428b-adb5-0294482fd743?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250322%2Fus-east-1%2Faws4_request&X-Amz-Date=20250322T063045Z&X-Amz-Expires=300&X-Amz-Signature=ed575488b40968463dd5aa828b8b4c87cbfe8c835d5f52cellc05389b4889d96X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Dprometheus-2.47.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream [following]  
--2025-03-22 06:31:42-- https://objects.githubusercontent.com/github-production-release-asset-2e65be/6838921/2f9b7b37-63a0-428b-adb5-0294482fd743?X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Credential=releaseassetproduction%2F20250322%2Fus-east-1%2Faws4_request&X-Amz-Date=20250322T063045Z&X-Amz-Expires=300&X-Amz-Signature=ed575488b40968463dd5aa828b8b4c87cbfe8c835d5f52cellc05389b4889d96X-Amz-SignedHeaders=host&response-content-disposition=attachment%3B%20filename%3Dprometheus-2.47.1.linux-amd64.tar.gz&response-content-type=application%2Foctet-stream
```



```
deepakp@Deepak: ~/prometl
[Unit]
Description=Prometheus
Wants=network-online.target
After=network-online.target
StartLimitIntervalSec=500
StartLimitBurst=5
[Service]
User=prometheus
Group=prometheus
Type=simple
Restart=on-failure
RestartSec=5s
ExecStart=/usr/local/bin/prometheus \
--config.file=/etc/prometheus/prometheus.yml \
--storage.tsdb.path=/data \
--web.console.templates=/etc/prometheus/consoles \
--web.console.libraries=/etc/prometheus/console_libraries \
--web.listen-address=0.0.0.0:9090 \
--web.enable-lifecycle
[Install]
WantedBy=multi-user.target
~
~
~
~
~
~
21,26 All
```

```
deepakp@Deepak:~/prometheus-2.47.1.linux-amd64$ ls
LICENSE NOTICE
deepakp@Deepak:~/prometheus-2.47.1.linux-amd64$ cd rm -rf prometheus-2.47.1.linux-amd64.tar.gz
-bash: cd: too many arguments
deepakp@Deepak:~/prometheus-2.47.1.linux-amd64$ cd
rm -rf prometheus-2.47.1.linux-amd64.tar.gz
prometheus --version
sudo vim /etc/systemd/system/prometheus.service
prometheus, version 2.47.1 (branch: HEAD, revision: c4d1a8beff37cc004f1dc4ab9d2e73193f51aaeb)
  build user:   root@04829330363be
  build date:   20231004-10:31:16
  go version:   go1.21.1
  platform:    linux/amd64
  tags:        netgo,builtinassets,stringlabels
deepakp@Deepak:~$ |
```

```
deepakp@Deepak: ~
deepakp@Deepak:~$ sudo systemctl enable prometheus
sudo systemctl start prometheus
sudo systemctl status prometheus
journalctl -u prometheus -f --no-pager
Created symlink /etc/systemd/system/multi-user.target.wants/prometheus.service → /etc/systemd/system/prometheus.service.
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: enabled)
   Active: activating (auto-restart) (Result: exit-code) since Sat 2025-03-22 06:43:50 UTC; 21ms ago
   Process: 18928 ExecStart=/usr/local/bin/prometheus --config.file=/etc/prometheus/prometheus.yml --storage.tsdb.path=/data --web.console.templates=/etc/p
   Main PID: 18928 (code=exited, status=217/USER)

Mar 22 06:43:50 Deepak systemd[1]: prometheus.service: Main process exited, code=exited, status=217/USER
Mar 22 06:43:50 Deepak systemd[1]: prometheus.service: Failed with result 'exit-code'.
lines 1-8/8 (END)
Hint: You are currently not seeing messages from other users and the system.
      Users in groups 'adm', 'systemd-journal' can see all messages.
      Pass -q to turn off this notice.
Invalid unit name 'prometheus -f --no-pager' escaped as "prometheus\x2\xa0-f\x2\xa0--no-pager" (maybe you should use systemd-escape?).
-- No entries --
deepakp@Deepak:~$ sudo useradd \
--system \
--no-create-home \
--shell /bin/false node_exporter
useradd: Warning: missing or non-executable shell '/bin/false node_exporter'
Usage: useradd [options] LOGIN
       useradd -D
       useradd -D [options]

Options:
--badname           do not check for bad names
-b, --base-dir BASE_DIR  base directory for the home directory of the
                        new account
--btrfs-subvolume-home  use BTRFS subvolume for home directory
-c, --comment COMMENT   GECOS field of the new account
-d, --home-dir HOME_DIR  home directory of the new account
-D, --defaults          print or change default useradd configuration
-e, --expiredate EXPIRE_DATE  expiration date of the new account
-f, --inactive INACTIVE  password inactivity period of the new account
-F, --add-subuid-for-system  add entries to subuid even when adding a system user
-g, --gid GROUP          name or ID of the primary group of the new
                        account
```

```
[Unit]
Description=Node Exporter
Wants=network-online.target
After=network-online.target
StartLimitIntervalSec=500
StartLimitBurst=5
[Service]
Uses=node_exporter
Group=node_exporter
Type=simple
Restart=on-failure
RestartSec=5s
ExecStart=/usr/local/bin/node_exporter \
--collector.logind
[Install]
WantedBy=multi-user.target
```



- **Create Prometheus User**

```
sudo useradd \  
--system \  
--no-create-home \  
--shell /bin/false prometheus
```

- **Install Prometheus**

```
wget  
https://github.com/prometheus/prometheus/releases/download/v2.4  
7.1/prometheus-2.47.1.linux-amd64.tar.gz  
tar -xvf prometheus-2.47.1.linux-amd64.tar.gz  
sudo mkdir -p /data /etc/prometheus  
cd prometheus-2.47.1.linux-amd64/  
sudo mv prometheus promtool /usr/local/bin/  
sudo mv consoles/ console_libraries/ /etc/prometheus/  
sudo mv prometheus.yml /etc/prometheus/prometheus.yml  
sudo chown -R prometheus:prometheus /etc/prometheus/ /data/  
  
cd  
rm -rf prometheus-2.47.1.linux-amd64.tar.gz  
prometheus --version
```

- **Create Prometheus Service**

```
sudo vim /etc/systemd/system/prometheus.service
```

- **Prometheus Service Configuration**

```
[Unit]  
Description=Prometheus  
Wants=network-online.target  
After=network-online.target  
StartLimitIntervalSec=500  
StartLimitBurst=5  
  
[Service]  
User=prometheus  
Group=prometheus
```

```
Type=simple
Restart=on-failure
RestartSec=5s
ExecStart=/usr/local/bin/prometheus \
  --config.file=/etc/prometheus/prometheus.yml \
  --storage.tsdb.path=/data \
  --web.console.templates=/etc/prometheus/consoles \
  --web.console.libraries=/etc/prometheus/console_libraries \
  --web.listen-address=0.0.0.0:9090 \
  --web.enable-lifecycle
```

```
[Install]
WantedBy=multi-user.target
```

- **Start Prometheus Service**

```
sudo systemctl enable prometheus
sudo systemctl start prometheus
sudo systemctl status prometheus
journalctl -u prometheus -f --no-pager
```

- **Install Node Exporter**

```
wget
https://github.com/prometheus/node_exporter/releases/download/v
1.6.1/node_exporter-1.6.1.linux-amd64.tar.gz
tar -xvf node_exporter-1.6.1.linux-amd64.tar.gz
```

```
sudo mv \
  node_exporter-1.6.1.linux-amd64/node_exporter \
  /usr/local/bin/
```

```
rm -rf node_exporter*
node_exporter --version
```

- **Create Node Exporter Service**

```
sudo vim /etc/systemd/system/node_exporter.service
```

- **Node Exporter Service Configuration**

```
[Unit]
Description=Node Exporter
Wants=network-online.target
```

*After=network-online.target*  
*StartLimitIntervalSec=500*  
*StartLimitBurst=5*

*[Service]*  
*User=node\_exporter*  
*Group=node\_exporter*  
*Type=simple*  
*Restart=on-failure*  
*RestartSec=5s*  
*ExecStart=/usr/local/bin/node\_exporter \*  
*--collector.logind*

*[Install]*  
*WantedBy=multi-user.target*

- ***Start Node Exporter Service***

*sudo systemctl enable node\_exporter*  
*sudo systemctl start node\_exporter*  
*sudo systemctl status node\_exporter*  
*journalctl -u node\_exporter -f --no-pager*

- ***Prometheus Configuration for Node Exporter and Jenkins***

*- job\_name: node\_export*  
*static\_configs:*  
*- targets: ["localhost:9100"]*

*- job\_name: 'jenkins'*  
*metrics\_path: '/prometheus'*  
*static\_configs:*  
*- targets: ['<jenkins-ip>:8080']*

- ***Validate Prometheus Configuration***

*promtool check config /etc/prometheus/prometheus.yml*  
*curl -X POST http://localhost:9090/-/reload*

